Introduction

The University of Limerick operates a modular system with continuous assessment. A module is a self-contained package of education taught during a single academic semester. Visiting students may choose from a wide range of modules and may cross register between faculties and departments. Acceptance on these modules is subject to academic prerequisites, timetabling constraints and ceilings on enrolments. The module descriptions that follow present an outline of the salient topics covered in each module.

Normal course load is 5 modules per semester.

Module Key

The module code is the key in most cases to find out when the class is running.

Example CU4051

CU is the subject area
4 is the type of study – only modules beginning in 4 are offered to study abroad students.
5 and 6 are postgraduate modules and modules beginning in 2 are certificate courses/access courses.
05 is just the departments way to distinguish between classes
The final digit is the only way to determine which semester it will run in.
1, 3, 5, 7 are fall semester classes
2, 4, 6, 8 are spring semester classes
1 and 2 are first year classes
3 and 4 are second year classes
5 and 6 are third year classes
7 and 8 are fourth year classes.

This is the usual key for classes but there are always exceptions...(of Course)

Modules featured in this Booklet

All modules are in alphabetical order by module code.

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*Only open to Journalism Majors

Faculty Key

Bus  Kemmy Business School
SEN  Faculty of Science & Engineering
AHS  Arts, Faculty of Humanities & Social Sciences
EHS  Faculty of Education & Health Sciences
HUM  Irish World Academy of Music & Dance

Disclaimer

The content of this booklet are for information purposes only and should not be viewed as the basis of a contract between student and the University. No guarantee is given that modules may not be altered, cancelled or otherwise amended at any time.
AC4001 - PRINCIPLES OF ACCOUNTING
ECTS Credits: 6

Accounting & Finance

Rationale and Purpose of the Module: This module is designed to introduce the student to the fundamental concepts and practices of financial accounting. It treats accounting as the manifestation of various social and political pressures and thus considers it in its social context. By learning how to measure financial performance and financial position, the student will appreciate accounting as forming the basis for financial decision-making.

Syllabus: This module introduces the student to the fundamental concepts and practices of financial accounting. Accounting is presented as a manifestation of various social and political pressures, which required that techniques be developed to account for trading and wealth. The topics covered include accounting in its political, regulatory, historical, social, economic, corporate governance and international contexts; introduction to the theoretical, conceptual and regulatory frameworks of accounting; traditional accounting model; capital, income and profit and measurement; principles of double entry bookkeeping; books of prime entry, ledgers, trial balance, internal controls, use of computers in recording and control of data, construction of final accounts for sole traders, partnerships and limited companies; accruals, prepayments and adjustments; depreciation and stocks; distribution of profits; profit and loss accounts and balance sheets, cashflow statements; nature, purpose, scope and framework of auditing. The ability of accounting to provide public accountability forms the basis for intergrating ethics into the subject matter.

Prerequisites: none

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AC4213 - FINANCIAL ACCOUNTING
ECTS Credits: 6

Accounting & Finance

Rationale and Purpose of the Module: The module will consider the theory and practice of selected international accounting standards and issues. Focus will be on the preparation and reporting of information to external users of financial information, especially, but not exclusively, equity investors. The international accounting standards and issues are examined in light of their historical development and discussions will not be solely around the actual content but what the regulations ought to be or might be. The module will cover the International Financial Reporting Standards.

Syllabus: The module will consider the theory and practice of selected international accounting standards and issues. Focus will be on the preparation and reporting of information to external users of financial information, especially, but not exclusively, equity investors. The international accounting standards and issues are examined in light of their historical development and discussions will not be solely around the actual content but what the regulations ought to be or might be. The module will cover the International Financial Reporting Standards.

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AC4305 - FINANCIAL INFORMATION ANALYSIS
ECTS Credits: 6

Accounting & Finance

Rationale and Purpose of the Module: The purpose of the module is to increase students' awareness of the information content of financial data and financial reports. The module considers the role and impact of accounting information in modern society within a variety of contexts. The module will enable students to critically analyse and interpret financial information in order to improve their decision-making capabilities.

Syllabus: The nature of accounting information and its role in financial and other markets; The regulatory framework of accounting information and the needs of users; The conceptual framework of accounting information: recognition and measurement issues, fair value; Theories of financial analysis including efficient market hypothesis; Corporate governance: shareholder value and stakeholder theory perspectives including the Anglo-American and European models; Preparation of financial statements: income statement and balance sheet; Analysis of financial statements: ratio analysis, uses and limitations, accounting information as an aid to decision-making; Creative accounting: off-balance sheet financing, revenue recognition, fraud, the role of ethics and whistleblowing; Corporate social responsibility: environmental accounting, sustainability, narrative reporting and the green agenda; International accounting issues and developments: harmonisation and convergence, global reporting needs.

Prerequisites: AC4001
AC4417 - MANAGEMENT ACCOUNTING 1  
ECTS Credits: 6

**Accounting & Finance**

**Rationale and Purpose of the Module:** This module provides students with an in-depth understanding of the role and purposes of management accounting in the management process. It deals with the applications and systems of management accounting that serve the information needs of contemporary organisations. It aims to give students an appreciation of the frontiers of management accounting and the associated theoretical and empirical research activity.

**Syllabus:** Objectives, scope and framework of management accounting; role and purpose of management accounting; management accounting and the business environment; ethical guidelines and challenges; cost terminology, concepts and classification; cost accumulation for inventory valuation and profit measurement; cost behaviour and analysis; cost-volume-profit relationships; cost-estimation methods; learning curve and non-linear cost functions; cost systems and design choices; job costing; activity-based costing and management; inventory costing and capacity analysis; variable versus absorption costing debate; information for planning and control; management control systems; organisational and social aspects of management accounting; responsibility accounting and the master budget; kaizen budgeting; activity-based budgeting; flexible budgets; standard costing and variance analysis.

AR2001 - FAB LEARNING PORTFOLIO  
ECTS Credits: 12

**School of Design**

**Rationale and Purpose of the Module:** The central objective of this module is to promote both the understanding and development of a range of skills on digital fabrication in different design areas, adding value to the corporate environment and to their careers.

The module aims to inform and facilitate the development of specific skills, which will be utilised in the workplace, through the application of theory encountered throughout the programme.

This module also aims to provide an opportunity for students to reflect on the development these key skills in an open and supportive learning environment.

**Syllabus:** Design Studio is the backbone of study in Architecture. Study is organised around design projects or themes, developing observational skills and understanding the use of existing and emerging digital fabrication technologies. By working through the project, the student will become conversant with the architectural design process and capable of developing initial architectural projects.

First year Design Studio exposes the student to the types of thinking and acting inherent in this process with the objective of helping the student become conversant with the process and capable of developing initial architectural projects.

**School of Design**

**Rationale and Purpose of the Module:** The principal aim of Third-Year Design Studio is to enable the student to demonstrate a first synthesis of the disparate influences that go to make up an architectural project using the range of skills and tools an architect is required to use. The emphasis in the first term is on developing a thoroughly researched design proposal and to produce a set of competent design documents.

**Syllabus:** An agenda will be set in Design Studio. The
basis for all propositions will have stated intent relative to societal ideas of place, collectivity and socio economic (or political) meaning. The architectural project brief will have inherent complexity, embodying personal space together with public space.

Through the detailed study of architectural references, a concept of ‘now relative to the past history of societal and architectural ideas will inform each students proposition since both will be researched and presented in parallel. The material realisation of these social and cultural concepts is capable of conveying meaning in a contribution that the strictly functional provision of buildings does not make.

The architectural proposition will move through a series of studies where the student is taught to use different scales, modes of operation and reference points. The emphasis will be on the mastery of investigative skills through a range of media on an ongoing basis.

Prerequisites: AR4004

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AR4011 - GRAVITY AND REACTION 1
ECTS Credits: 3

School of Design

Rationale and Purpose of the Module: Give students the understanding of a number of useful structural concepts using experiment, intuition and formal learning. Give students a strong conceptual and formal grasp of these concepts, that are applicable to actual conditions.

Syllabus: Lectures, Experiments in the following concepts:

One Equation: Gravity + Reaction = Equilibrium (stable, unstable, neutral).
Co-Ordinate Systems
What does 3D space mean?
What is gravity? Einstein/Es view: Newton/Es view: Effects of gravity have been described yet what is it? How does it act over distance? Gravity waves never detected.
Friction
If force causes a change in velocity why is it so hard to push start a heavy timber crate? Why cannot a small child push start the crate?
Components of a Vector
A force can act on a body without changing its speed of motion; only its direction of motion; planetary motion. Tension & Compression, Buckling of Compression Members, Moments
Equilibrium: How does an even see-saw balance? Neutral / unstable equilibrium. How does an uneven see-saw balance. The gravity forces are different.
Components of a force, Internal Forces, Beams: Members that Bend, Stiffness, Materials, Connections

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AR4007 - DESIGN STUDIO 4A
ECTS Credits: 18

School of Design

Rationale and Purpose of the Module: In order to facilitate more extensive and, at the same time, more focused design projects and adequately comprehensive thesis projects, credits awarded to Design Studio 4a and 4b increase to 18 credits while the number of parallel modules is reduced

Syllabus: In Y4 students start a personal pursuit; they must - through their design projects and their research work - relate to the world of architecture in their own personal way. Students are expected and asked to voice their position in architecture, to find their direction through architectural design. Students develop a method of research and allocate significant time to the research part of the curriculum. The architectural project is tightly allied to construction and the physicality of building; construction technology is an important part of the years work.
A research led project in the autumn semester opens the expanse of architectural intelligence into circumscribed cultural and environmental fields. Students develop a fluency in the means of making of and thinking through things in terms of structure, technology, and environment to the point where they can rise above the practicalities and conceptualise as well.

AR4015 - GRAVITY AND REACTION 5
ECTS Credits: 3

School of Design

Rationale and Purpose of the Module: In depth study of Load Path, in depth study of structural form, particularly as it relates to specific material properties. Learning through the analysis of structural models using experiment, project work and formal learning. Give students a strong conceptual and formal grasp of materials used in structural design, which are applicable to actual conditions.

Syllabus: Continued Introduction to structural concepts. Topics covered will be portal frames, crane structure; RC beam design; timber truss design in qualitative process; shells, membranes. Introduction to materials used in structural design; concrete, reinforced concrete; timber; laminated timber; glulam; steel; models to describe failure modes in structures.
Students will research:
(a)* Materials in the studio and in a site context.
(b)* Materials used in structural design and their relevant components
(c) Failure modes in slab, trusses, beams, shells and membranes.

Prerequisites: AR4012

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AR4013 - GRAVITY AND REACTION 3
ECTS Credits: 3

School of Design

Rationale and Purpose of the Module: Give students an understanding of structural models using experiment, project work and formal learning. Give students a strong conceptual and formal grasp of materials used in structural design, which are applicable to actual conditions.

Syllabus: Continued Introduction to structural concepts. Topics covered will be portal frames, crane structure; RC beam design; timber truss design in qualitative process; shells, membranes. Introduction to materials used in structural design; concrete, reinforced concrete; timber; laminated timber; glulam; steel; models to describe failure modes in structures.
Students will research:
(a) Materials in the studio and in a site context.
(b) Materials used in structural design and their relevant components
(c) Design and build in model form a simple bridge with calculated design loads and span.

Prerequisites: AR4014
AR4021 - REPRESENTATION / DRAWING 1
ECTS Credits: 3

School of Design

To establish drawing as a tool of observation, a tool of thinking and a tool of representation, this course is composed of two different types of drawing exercises:

- Studio based exercises with weekly changing subjects introducing key aspects of architectural vocabulary (light and space, site, human scale, skin and comfort, flows and organisation, vision and architecture). Short introducing lectures are followed by a drawing or sketching exercise, and, in the next step by a model making exercise, where the drawings from the exercise have to be interpreted and transformed into the 3rd dimension. Contents of both exercises as well as the chosen format, materials and techniques are directly related to the particular subject. As subject matter, each session will be organized around a specific theme from art, photography, film, dance, architecture

- Exercises in architectural drawing in a conventional sense, line drawings of floor plans, sections and details in pencil, are introduced within an extensive lecture, then elaborated by the students as far as possible self-dependently and later on reviewed.

In both parts of the course curriculum hand drawing with pencil is emphasized in order to develop within the students a sensitivity to the medium. Exercises are on opaque white paper so as to prevent tracing and use of construction aids.

Prerequisites: AR4022

AR4025 - REPRESENTATION / DRAWING 5
ECTS Credits: 3

School of Design

Rationale and Purpose of the Module: In this module students are introduced to the computer and related modes of representation, in conjunction with continuing studies in hand drawing. Switching between virtual and analogue modes of representation, e.g. models, drawings, digital photography, Photoshop, Illustrator, and other graphics programmes will be explored as tools of transformation and spatial, logical, and structural exploration.

Syllabus: Widening the pallet of modes of representation that the student must master, drawing is taught as a tool of observation, a tool of thinking and a tool of representation, this course consists of three different types of drawing exercises:

- Moving actively between analogue and digital modes of representation, students will develop their ideas between media, exploiting the most powerful aspects of each in terms of their design. Students will develop in parallel their hand drawings skills.

AR4031 - HISTORY AND THEORY OF ARCHITECTURE 1
ECTS Credits: 3

School of Design

Rationale and Purpose of the Module: The first year program in History-Theory aims to expand studentsÆ horizons of knowledge about architecture while teaching foundational skills in reading and writing in the discipline. Even though students at the School of Architecture are expected to be highly literate and articulate, entering into a new field ÿsuch as architecture is a difficult intellectual transition to make. Students will need to develop specific cognitive skills to address the new territories they will have to map. The first year program sets out to help students attain a basic literacy in the discipline while introducing a selection of the monuments of modern architecture together with contemporary ways of thinking about the field.

Syllabus: The theme for the fall workshop is Site. Objectifying and describing a site is typically difficult for beginning, or even advanced students, and yet is a skill all architects must master. Site is the precondition for construction and the link between architecture and the world. With forms of human habitation rapidly changing due to urbanization, site becomes a more important consideration every day.

Seminars will address Fields, Territories, Surveys, Flows, and Contexts, surveying both historical and contemporary material to challenge students. As an introduction to architecture as an expanded field, students will encounter disciplines such as politics, geology, philosophy, infrastructural engineering, land art, archaeology, and landscape architecture. Buildings will illustrate responses to the topics and students will encounter a selection of the most significant works in modern and contemporary architecture. Projects discussed include Haussmann’s Boulevards, the Paris Opera, MiesÆs Friedrichstrasse skyscraper, the Villa Savoye, the Barcelona Pavilion, the Bauhaus, ArchigramÆs Instant City, SuperstudioÆs Continuous Monument, Herzog and de MeuronÆs Signal Box Auf dem Wolf, and the Sendai Mediatheque. Readings by authors such as Rem Koolhaas, Colin Rowe, Michel Foucault, St. Brendan, Guy Debord, John McPhee, John Stilgoe, Robert Smithson, and Georg Simmel will challenge students with the diverse ways by which we can describe sites.

We will visit three nearby sites first-hand in order to learn how to discuss them. Afternoon writing workshops will focus on describing these sites.
School of Design

Rationale and Purpose of the Module: The second year program in Architectural Research provides students with a comprehensive survey of the history of architecture and urbanism. Students will continue to hone the specific cognitive skills required to address the field, deepening their knowledge of the local and global built domain while reading, writing, and researching architecture. The goal is to provide students with a basic knowledge and understanding of architecture and urban design in the period between circa 1851 and 1980. In addition, the course is designed to teach students how to critically analyze and evaluate built projects from a variety of perspectives, and how to communicate these ideas in spoken and written form.

Syllabus: The first part of the course deals with ways of looking at the history of land and society; people, time, place (methodological with material from the Mediterranean, Ireland and Limerick). It will include several Case Studies: Irish building land 1600-2000 (ownership, tenure, land reform, rural and urban populations), building the city; Limerick 1200-2000 (racial, social and religious segregation over time), and deal with the shape of the city: (Medieval, Renaissance, Baroque and Industrial ideals of the city, with emphasis on land use in relation to buildings and spaces between buildings, building land in Ireland today; not about the law but about trends, patterns, densities.

The second part of the course is a contemporary theoretical survey of key theoretical aspects of modern architecture that exposes students to the monuments of the modern movement. The course focuses on the body in modernism, e. g. the body in an emergent consumer environment and visual culture (Joseph PaxtonÆEs Crystal Palace, the department stores, the arcades), as an agent of production and instrument of sensation (William Morris, Art Nouveau, the Secessionist), in motion (Frank Lloyd Wright, the Werkbund, Futurism, de Stijl), in a culture of hygiene (Tony Garnier, Le CorbusierÆEs urbanism, the Suburb), at home and in exhibition (the International Style, the Schindler House, the Eames House, the Farnsworth House, JohnsonÆEs Glass House), and nomadic (Team X, Kurokawa, the SmithsonÆEs House of the Future, Archigram).

Prerequisites: AR4032

School of Design

Rationale and Purpose of the Module: The third year program in Architectural Research continues the comprehensive survey of the history of architecture and urbanism in the programme curriculum. This module exposes students to the relationship of architecture to technology and materials, both naturally occurring and those produced by man both in Ireland and globally.

The goal for the course is to give students a broad introduction to architecture throughout the ages, from the classical Greek and Roman periods to the present day while introducing them to the role that materials and technology have in architecture.

Syllabus: Through lectures, discussion seminars, and writing the course will survey the relationship between architecture, materials, and technology from prehistory to the present day.

Starting with the classical Greek and Roman periods, into the present day ôSilicon Age,ô both society and architecture have been profoundly influenced by materials and technology. This course will be composed of a research and readings on the period by experts in the history of science and technology, Irish history, structural engineering, materials science, structures, and the history of architecture. Students will complete their own directed research projects on a particular work of architecture, and encounter the work directly, making observations from experience with the physical object.

Prerequisites: AR4034

School of Design

Rationale and Purpose of the Module: The aims of this class are:
1. to explain clearly and simply the basic principles of construction.
2. to show how much architectural expression depends on its constructional composition. Special attention will be will be paid to constructional aspects which imbue meaning and in this aspect it differs from the albeit relevant but exclusively technology-focused literature.
3. to introduce students to the importance of representing clear, legible and organised ideas to others in the construction industry.

Syllabus: Principles of assembly of buildings will be studied beginning through a raw material and a particular building typology. The focus will be on concrete, timber and steel construction. Practical reflections will be presented next to theoretical ones. Sober detail drawings will be introduced alongside thoughtful reflections. Basic
construction concepts will be presented next to specific descriptions of construction processes. DRAWING EXERCISE: Each exercise will involve disseminating the required information the previous week. A short introduction will precede each exercise. LECTURE COURSE: A weekly lecture as well as visiting guest tutors will introduce students to properties of materials, covering descriptions of manufacturing methods, assembly and product ranges of the most important modern building materials. DIARY OF A BUILDING: Students will be asked to keep a diary of progress on each site that will involve sketches, notes and photographs. Each group will be asked to present their findings to the class at the end of the year. CASE STUDY: A building precedent will be presented to each student under the headings of concept, process and system.

**Prerequisites:** AR4042

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**AR4045 - ASSEMBLY AND TECHNIQUES 4**
ECTS Credits: 3

**School of Design**

**Rationale and Purpose of the Module:** The aims of this class are:
- a. to introduce students to the initial studies required to later generate a comprehensive set of working drawings of a third year design studio project.
- b. to develop further the student/Es own intuitive skills in technique alongside knowledge of available construction technology today.
- c. to develop the student's capacity to interrogate and develop design decisions through construction principles

**Syllabus:** Developed principles of assembly and techniques will be further studied concurrently with the production of a full set of working drawings.

**Prerequisites:** AR4052

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**AR4051 - ENVIRONMENTAL SYSTEMS AND FORCES 1**
ECTS Credits: 3

**School of Design**

**Rationale and Purpose of the Module:** Basic understanding of physical backgrounds and interconnections for a sustainable development

**Syllabus:** Sustainable development is a base for the future of human society on our planet. Architects as the designer for the built environment have a key position in this approach. Therefore a basic understanding of the physical backgrounds and interconnections is necessary. This lecture content spans from global to local and micro-climate, to energy and its different forms and sources towards materials and their properties. Parallel and interconnected to the teaching of design basics like space, light, boundaries students will learn the physical backgrounds and properties by handling and personal experiences.

**Prerequisites:** AR4043

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**AR4056 - ENVIRONMENTAL SYSTEMS AND FORCES 5**
ECTS Credits: 3

**School of Design**

**Rationale and Purpose of the Module:** Sustainable development is a base for the future of human society on our planet. Architects as the designer for the built environment have a key position in this approach. Lectures on details of Environmental system and forces such as:
- - integrated design of case studies
- - process integration
- - acoustical, visual and thermal comfort
- - building physical basics
- - heat losses and energy balance

Research project on the modern building in respect of environmental systems

**Prerequisites:** AR4052

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**AR4053 - ENVIRONMENTAL SYSTEMS AND FORCES 3**
ECTS Credits: 3

**School of Design**

**Rationale and Purpose of the Module:** Advanced understanding of physical backgrounds and interconnections for sustainable development, and the integration of environmental principles into architectural works. Emphasis will be placed on the study of material properties. Particular attention will be paid to integration of environmental principles into design studio work. Specific material properties will be studied, and modelled.

**Syllabus:**

Realisation of group project of Autumn Semester, Yr 2 as physical manifestations
- - daylight model of studio space
- - solar simulator
- - weather station
- - indoor comfort station
- - waste sorting system

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**AR4052 - ENVIRONMENTAL SYSTEMS AND FORCES 5**
ECTS Credits: 3

**School of Design**

**Rationale and Purpose of the Module:** Sustainable development is a base for the future of human society on our planet. Architects as the designer for the built environment have a key position in this approach. Lectures on details of Environmental system and forces such as:
- - integrated design of case studies
- - process integration
- - acoustical, visual and thermal comfort
- - building physical basics
- - heat losses and energy balance

Research project on the modern building in respect of environmental systems
modelling and analysis. Both analogue and digital means of simulation will be taught. Daylight modelling, building fabric U-value calculations, air-tightness, and CFD modelling of buildings are some examples of the types of essential simulation during the design process. The emphasis of the course is on the acquiring analytical techniques and skills required to evaluate the environmental performance of a set of elements under a specific condition.

Building on observation, analysis and design, students will develop skills for critical inquiry into the nature of architectural design and how it engages with the concepts of site, place and comfort. The idea of ‘boundary conditions’ will be developed in the context of an integrated understanding of structure + environment + materials.

The following subjects will be covered:
- Day-lighting and artificial lighting design in relation to a large-scale physical model
- Thermal energy losses and gains through envelope
- Performance of a building in relation to air movement inside and outside (applied CFD modelling tools)
- Material selection and embodied energy considerations
- Energy/Water/Waste systems integration/design

Prerequisites: AR4054

AR4073 - DESIGN STUDIO 2A
ECTS Credits: 15

School of Design

Phase I Using mapping as a vehicle for speculative architectural analysis, students will map one defined aspect of a particular place as ground, infrastructure, climate and occupation of space. Through mapping, students will confront their first analysis with more specific information: climate, ground, geology, built structures, growing structures, water treatment and flows, infrastructural networks, historic traces, land use and occupation of space. It is about identification of specifics through drawing, registering, measuring, timing, investigating; observe on site at several occasions and document, explain conditions, situations, make drawings, diagrams and sketches to explain conditions

Phase II Explore settings for physical activity and for the interconnection that happens between spectator and sport and between land and the body. Cultural and technical characteristics of sport must be integrated into the land in a way, which will change it consciously. Students first make a first landscape urban proposition (MODEL) plus make a set of drawings showing dimensional sizes for activities include heights PLANS, SECTIONS.

Make a set of investigations of three different structures and how they work with the land.

Development Synthesis Two: Choreography, colour, light, material, crowd versus the individual delineation, studies Development Draw Up and review MODEL

The design studio is co-ordinated with the content of parallel course modules and integration between studio work and course module work is a vital and innovative component of the studio structure.

Prerequisites: AR4002

AR4317 - Advanced Construction 1
ECTS Credits: 3

School of Design

Rationale and Purpose of the Module: An extended and clearly structured curriculum in construction design to induce a more innovative and imaginary approach to materials and details. In order to ensure the expected high level of competency in advanced building construction (at an industrial scale and with respect to contemporary and innovative technologies) SAUL introduces a set of Advanced Construction modules throughout Y4 and Y5 in close relation to and in support of the Design Studio projects.

Syllabus: The series of modules in Advanced Construction expands the scope of students competencies in building technologies and construction beyond traditional methods and their related familiar scale. In the final year, students engage in a tested dialogue with concerns of design, structure, environment, history and theory, representation, digital media, and other related areas and interests.

Staff and student undertake in-depth research into specialist areas of technology. Case studies focus is on an integration of structural and environmental systems in response to specific conditions that require complex skills in analysis and/or design. The students are expected to apply findings from directed and independent research on advanced construction technologies to develop each students thesis proposal individually.

AR4337 - Urban Design
ECTS Credits: 6

School of Design
**Rationale and Purpose of the Module:** Students are offered the opportunity to tailor their education to a larger degree in fourth and fifth year, with the invitation to make choices of modules beside the core Design Studio and adjacent modules. The introduction of architecture electives is intended to provide a flexible framework to accommodate the diverse field of interests and (short-term) research projects within architecture, and to allow students to pursue their own personal interests within architecture. Smaller classes allow for in-depth interrogation of the subject at an advanced level.

The elective modules have been conceived and created to give venue to research, to permit the students particular (and varying) interests to diversify and develop - apart from the Design Studio. This is markedly different from the lower three years of the course, where integration is the focus of the course, coordination between modules and Design Studio is essential, and particular student interests are less relevant than developing competence as an architect. Therefore the content of the elective modules cannot be specifically related to the Design Studio - this is to allow the student the space to start making their own decisions and setting their own direction.

**Syllabus:** Architecture electives provide a flexible framework to accommodate (short-term) research projects on a wide spectrum of issues, and to allow students to pursue their own personal interests within architecture. Focusing on case studies, the elective module will be delivered through a programme of lectures, seminar discussions and case study presentations. - The subject matter can change depending on the interest and availability of academic staff.

The module addresses the recent history, current discourse and emerging processes of urban design and place-based planning governance, with an emphasis on the design of civic space. It explores directly the meaning and application of sustainable development policies in urban development. It investigates, particularly, contemporary examples of interdisciplinary practice in urban design and emerging, bottom-up approaches to place making as a design practice. The course will develop a context for understanding the role of design in shaping the urban environment, both physically and culturally.

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**AR4347 - Design Philosophy**  
ECTS Credits: 6

**School of Design**

**Rationale and Purpose of the Module:** Students are offered the opportunity to tailor their education to a larger degree in fourth and fifth year, with the invitation to make choices of modules beside the core Design Studio and adjacent modules. The introduction of architecture electives is intended to provide a flexible framework to accommodate the diverse field of interests and (short-term) research projects within architecture, and to allow students to pursue their own personal interests within architecture. Smaller classes allow for in-depth interrogation of the subject at an advanced level.

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**Syllabus:** Architecture electives provide a flexible framework to accommodate (short-term) research projects on a wide spectrum of issues, and to allow students to pursue their own personal interests within architecture. Focusing on case studies, the elective module will be delivered through a programme of lectures, seminar discussions and case study presentations. - The subject matter can change depending on the interest and availability of academic staff.

Considering a wide array of research processes from the scholarly to the wildly eccentric, this module will analyse the relationship between inquiries into archives, sites and objects and the structures used to organize the results. Taking research beyond a mundane or tedious task, this module will uncover the researchers power to make strange and unpredictable the world of neat certainties. Subsequently, it will relate the way we position ourselves in the world, the way we describe it, to the way we act within and upon it.

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**AR4397 - UTOPIAN STUDIES**

**School of Design**

**Rationale and Purpose of the Module:** Students are offered the opportunity to tailor their education to a larger degree in fourth and fifth year, with the invitation to make choices of modules beside the core Design Studio and adjacent modules. The introduction of architecture electives is intended to provide a flexible framework to accommodate the diverse field of interests and (short-term) research projects within architecture, and to allow students to pursue their own personal interests within architecture. Smaller classes allow for in-depth interrogation of the subject at an advanced level.

The elective modules have been conceived and created to give venue to research, to permit the students particular (and varying) interests to diversify and develop - apart from the Design Studio. This is markedly different from the lower three years of the course, where integration is the focus of the course, coordination between modules and Design Studio is essential, and particular student interests are less relevant than developing competence as an architect. Therefore the content of the elective modules cannot be specifically related to the Design Studio - this is to allow the student the space to start making their own decisions and setting their own direction.

**Syllabus:** Architecture electives provide a flexible framework to accommodate (short-term) research projects on a wide spectrum of issues, and to allow students to pursue their own personal interests within architecture. Focusing on case studies, the elective module will be delivered through a programme of lectures, seminar discussions and case study presentations. - The subject matter can change depending on the interest and availability of academic staff.

This module will examine the nature and history of utopianism, especially in relation to the processes of the imagination and social design. It will consider utopianism in all its manifestations, including books and buildings, intentional communities and political movements; and it will especially pay attention to the role of the utopian method in producing the built environment. To do so, students will read and discuss work that describes and enacts utopia in description and theory and in fiction and film (especially science fiction). Classes will be comprised of a lecture, followed by close discussion of assigned texts.
AR4407 - ARCHITECTURE INTELLIGENCE UNIT
ECTS Credits: 6

School of Design

Rationale and Purpose of the Module: Students are offered the opportunity to tailor their education to a larger degree in fourth and fifth year, with the invitation to make choices of modules beside the core Design Studio and adjacent modules. The introduction of architecture electives is intended to provide a flexible framework to accommodate the diverse field of interests and (short-term) research projects within architecture, and to allow students to pursue their own personal interests within architecture. Smaller classes allow for in-depth interrogation of the subject at an advanced level.

The elective modules have been conceived and created to give venue to research, to permit the students particular (and varying) interests to diversify and develop apart from the Design Studio. This is markedly different from the lower three years of the course, where integration is the focus of the course, coordination between modules and Design Studio is essential, and particular student interests are less relevant than developing competence as an architect. Therefore the content of the elective modules cannot be specifically related to the Design Studio this is to allow the student the space to start making their own decisions and setting their own direction.

Syllabus: Architecture electives provide a flexible framework to accommodate (short-term) research projects on a wide spectrum of issues, and to allow students to pursue their own personal interests within architecture. Focusing on case studies, architectural scenarios and design strategies, the elective module will be delivered in an intense workshop format. - The subject matter will vary depending on research interests, collaboration agreements, and additionally available funding.

As part of a university, IU offers an unbiased platform to allow a discussion and exploration with every interested party - local authorities, stakeholders, companies, conservation bodies, planners, professional architects, engineers etc. The research will engage both interested professionals and students of architecture in an exciting opportunity to demonstrate the capacity of architecture in a wider set of imminent and pressing questions. As a group, IU works in a strategic way, located within the context of ongoing work at SAUL.

AS2391 - MANUFACTURING TECHNOLOGY AND CAD
ECTS Credits: 6

School of Engineering

Rationale and Purpose of the Module: Introduce students to engineering principles and techniques prior to them starting an undergraduate engineering programme.

Syllabus:
* Understanding the role of a measurement and calibration system in engineering.
* Understand the basic techniques used in joining components/materials.
* Understand the principles of machining.
* Acquire a basic understanding of a CAD package and principles of engineering drawing.

AW6001 - ACADEMIC LITERACIES FOR INTERNATIONAL POSTGRADUATE STUDENTS 1
ECTS Credits: 3

School of Modern Languages and Applied Linguistics

Rationale and Purpose of the Module: This module is intended to replace EF6001, which provides language support at Proficiency Level for students on the MA TESOL programme whose L1 is not English. This modification requires broadening EF6001 to offer support to all international students undertaking PG programmes with the aim of enabling students to adapt better to their new learning environment. The University’s strategic goal is to increase the number of International students coming to UL and the number of UL students who have an overseas experience as part of their degree. With an increase in international students comes a new set of challenges such as different educational structures, teaching and learning styles, as well as social and cultural differences. This module is intended to assist international students undertaking PG Programmes with the aim of enabling students to adapt better to their new learning environment. In order to ensure that the transition from their home system to UL is as smooth as possible and the student’s maximum academic and social potential is met, this module aims to:

* Equip International students with the practical skills necessary to succeed in UL
* Enable International students to become critical thinkers and researchers
* Equip International students with the written and oral communication skills necessary to participate effectively in the academic community
* Encourage students to become autonomous/independent learners
* Enhance the learning experience of students

Syllabus: There are many challenges facing International students (culture shock, language shock and academic shock), and this module offers strategies for managing this experience and for providing a rich and engaging learning environment for such students. This module will raise students’ awareness of the academic support systems, cultures, and protocols within UL; provide students with information sourcing and management skills; and provide students with strategies for successful integration and learning in UL. This module will also offer practice in skills such as academic reading (reading methods; reading abstracts; fact versus opinion; critical thinking; assessing internet sources critically), writing (the planning process; analysing titles; brainstorming; outlining) and presenting (learning and practising how to write an outline of a project presentation; learning how to give an oral presentation of a research paper by using PowerPoint (or other software).

Proposed Content:
1 x 12 hour Pre-Sessional Block
- Session 1: Academic Support Systems and Cultures
- Session 2: Information Sourcing
- Session 3: Information Management
- Session 4: Academic Protocols (Plagiarism)
- Session 5: How to Become a Successful Learner
1 x 12 hour Training (Weeks 3-8)
- Weeks 3&4: Academic Reading Skills
- Weeks 5&6: Presenting Skills
- Weeks 7&8: Introduction to the Research Project

BC4201 - VALIDATION PRINCIPLES AND PRACTICES FOR THE MEDICAL DEVICE INDUSTRY
ECTS Credits: 9

Chemical Sciences

BC4803 - MICROBIAL TECHNOLOGY 1A
ECTS Credits: 6
Chemical Sciences

Rationale and Purpose of the Module: To introduce students to the fundamentals of microbiology. To develop skills in handling and manipulating micro-organisms. To illustrate the role of microbiology in the environment.


Prerequisites: BY4001

BC4825 - MICROBIAL TECHNOLOGY 2
ECTS Credits: 6

Chemical Sciences

Rationale and Purpose of the Module: To build on the fundamental concepts of microbiology. To develop skills in manipulating and identification of micro-organisms. To develop an understanding of metabolic pathways. Understanding basic concepts in microbiology for the development of diagnostic kits. To illustrate the role of microbiology in the clinical and food environment. Understand viruses and their life cycles.


Prerequisites: BC4803, BY4001

BC4903 - BIOMOLECULES
ECTS Credits: 6

Chemical Sciences

Rationale and Purpose of the Module: To impart an understanding of the structure, properties and biochemical function of the major groups of biological molecules found in living organisms, along with selected biotechnological applications of such biological molecules. To impart some basic biochemical laboratory skills, principally how to detect & quantify selected biomolecule types.


Prerequisites: BC4904

BC4905 - GENETIC ENGINEERING
ECTS Credits: 6

Chemical Sciences

Rationale and Purpose of the Module: To introduce the techniques involved in genetic engineering and to familiarise the students with their theoretical basis and practical uses

To demonstrate the diverse applications of the techniques of molecular biology in research and development and quality control in a wide variety of industries

To impart core laboratory skills relevant to molecular biology

To prepare the students for careers in the biotechnological/biopharmaceutical/etc industries

Syllabus: DNA structure, transcription, translation; Gene structure function and control. Molecular techniques to manipulate DNA, restriction enzymes and other DNA modifying enzymes; DNA transfer methods; polymerase chain reaction; cDNA and genomic cloning; cloning and expression vectors; selection and screening methods; phenotypic Vs genotypic screening; Northern, Southern and Western blotting; heterologous protein expression; cloning in plants and animals; introduction to bioinformatics - databases and genome analysis; gene therapy; transgenic animals; ethics of genetic engineering. Nucleic acid diagnostics: DNA profiling and DNA fingerprinting.

Prerequisites: BC4903, BC4904

BC4957 - BIOINFORMATICS IN GENETIC AND PROTEIN ANALYSIS
ECTS Credits: 6

Chemical Sciences

Rationale and Purpose of the Module: To introduce students to the uses and applications of modern bioinformatics in elucidation of protein and genetic information using both theoretical and practical approaches


Prerequisites: BC4904, BC4905

BR4103 - AUTUMN PRACTICUM (AHSS - 6 CREDITS)
ECTS Credits: 6

Politics and Public Admin
BR4503 - AUTUMN PRACTICUM (SEN - 6 CREDITS)
ECTS Credits: 6
Politics and Public Admin

BS4001 - PRINCIPLES OF INTERNATIONAL BUSINESS
ECTS Credits: 6
Management and Marketing
Rationale and Purpose of the Module: This module aims to provide students with an understanding of the international dimensions of business. It provides students with a foundation in the theory and practice of businesses operating within a globalised context. The module introduces students to the extensive remit of international business activity and to key concepts concerning companies operating internationally.
Syllabus: The course will introduce topics concerning international business while illustrating its scope and importance. Topics will include the impact of geography, culture and politics on business dealings. Students will study formal institutions (economic and political) and informal factors such as culture, religion, language and ethics. Other topics may include: globalisation; international trade; corporate social responsibility; global branding; international management strategy.

BY4007 - NEW DEVELOPMENTS IN AGRICULTURAL SCIENCE
ECTS Credits: 3
Biological Sciences
Rationale and Purpose of the Module: The purpose of the module is to provide students with both an understanding and appreciation of new developments in the practice and teaching of agricultural science. This will enhance their technical and pedagogical skills in agricultural science and increase their confidence in teaching the subject. In addition the module will equip students with the skills necessary to conduct independent research in agricultural science.
Syllabus: The module is delivered through a combination of lectures, field trips and online resources. Emphasis will be placed on mixed ability teaching utilising a variety of approaches to assessment to include formative, summative and diagnostic strategies; fostering a community of learning (FCL) and self-directed learning in agricultural science. The module content will cover the following topics:
1. Agricultural Pedagogy
   There is a need to provide student with subject specific skills. Emphasis will be placed on investigative and inquiry based approaches in the classroom, laboratory and field based situations.
2. Precision Agriculture
   Information technology is increasingly deployed across all farming systems for a variety of purposes such as efficient resource usage (e.g. fertilisers, fuel), animal fertility, grazing management and mitigation of the environmental impact of agriculture (e.g. greenhouse gas emissions). This content will advance student knowledge of IT use in agriculture.
3. Agriculture and the Environment
4. Health and Safety in Agriculture
   Health and Safety is an often under-appreciated but crucial issue in farm management. Students will be aware of the need for farm level health and safety procedures and be able to recognise basic steps for its implementation.
   The course is examined through a series of term tests, written reports and an end of semester exam based on multiple choice questions and essay style questions.
Prerequisites: BY4016

BY4015 - PLANT PHYSIOLOGY
ECTS Credits: 6
Biological Sciences
Rationale and Purpose of the Module: To introduce the students to the principles and applications of plant physiology.
Prerequisites: BY4002
**BY4023 - ANIMAL DIVERSITY**
*ECTS Credits: 6*

**Biological Sciences**

Evolution of animal diversity; Animal architecture; Environmental considerations; Invertebrate classification and relationships - the Protozoans, the Porifera and Placozoa, Introduction to the hydrostatic skeleton, the Cnidarians, the Platyhelminthes, the Nemertines, the Moluscs, the Annelids and sipunculans, the Arthropods, the Nematodes, the Echinoderms; An overview of invertebrate reproduction and development.

Comparative vertebrate morphology; Historical predecessors-evolution; Definition of the phylum Chordata; Chordate characteristics; Protocordates; Vertebrate classification Agnathans, Gnathostomes, Teleostomi, Tetrapods, Amniotes; Biological design size and shape, structural analysis, functional analysis, ecological analysis; Introduction to animal behaviour and the influences of environment on such behaviour; Comparison of the processes of homeostasis and control in vertebrate and invertebrate body systems; Assessment of the importance of animal diversity to biological sciences and the environment.

**Rationale and Purpose of the Module:** To provide a solid understanding and knowledge of fundamental biochemical processes which will underpin the ability of secondary school educators to communicate effectively the central principles of biology.

**Syllabus:**

- **Topic 1:** Carbohydrates
- **Topic 2:** Lipids
- **Topic 3:** Amino acids
- **Topic 4:** Protein
- **Topic 5:** Nucleic acids
- **Topic 6:** Enzymes
- **Topic 7:** Membranes
- **Topic 8:** Muscles
- **Topic 9:** Nerves
- **Topic 10:** Hormones
- **Topic 11:** Metabolism

This is supported by a series of laboratory based practical investigations covering the following areas:

- **Area 1:** Analysis of carbohydrates
- **Area 2:** Exploring Lipids
- **Area 3:** Behaviour of Amino acids and Proteins
- **Area 4:** Enzymes
- **Area 5:** Nutrition

The course is examined through a series of term tests, practical laboratory write ups, and an end of term exam based on multiple choice questions and essay style questions.

**BY4024 - Principles of Human Physiology**
*ECTS Credits: 6*

**Biological Sciences**

**Rationale and Purpose of the Module:** To introduce students to the basic concepts and principles of human physiology.

On completion of the module students will be able to:
- demonstrate a knowledge of the structure and function of major human physiological systems. Additionally, the influence and relationship between various human physiological conditions and metabolism of nutrients will be considered.

**Syllabus:**

This module will examine the structure and function of the major human physiological systems. Physiology of the blood, circulation and lymphatic systems. The nervous system: central, peripheral and autonomic. Physiology of skeletal, muscle and integumentary systems. The respiratory system: mechanical properties of breathing, pulmonary and bronchial circulation, the transport of oxygen and carbon dioxide. The digestive system: the gastro-intestinal tract, intake and absorption of nutrients. The renal system: kidney structure and function, osmoregulation and homeostasis, regulation of acid balance. The endocrine system: regulation of calcium and phosphate metabolism. Reproductive system: Sensory system: perception of taste and aroma. The influence of physiological conditions on nutrient absorption will be considered e.g. inborn errors of metabolism on iron metabolism. The impact of food constituents on physiology will be examined e.g. ingestion of toxins.

**Prerequisites:** BY4002, BY4001

**BY4025 - Crop and Grassland Science**
*ECTS Credits: 6*

**Biological Sciences**

Climate in Ireland, climate and plant growth, agricultural policy. Fruits crops, protected crops, horticultural pests, weeds and diseases, integrated crop production. Landscape management. Fertilisers and manures; tillage machinery; cultivation, management and harvesting of arable crops and root crops; farm forestry; energy crops; grassland establishment and management; agriculture and the environment.

**BY4035 - Cellular Biology and Biochemistry**
*ECTS Credits: 6*

**Biological Sciences**

Rationale and Purpose of the Module: To provide a solid understanding and knowledge of fundamental biochemical processes which will underpin an understanding of nutrition, metabolism and exercise physiology.

**Syllabus:**

- **Topic 1:** Carbohydrates; Lipids; Amino acids; Protein; Nucleic acids; Enzymes; Membranes; Muscles; Nerves; Hormones; Metabolism

This is supported by a series of laboratory based practical investigations covering the following areas:

- **Analysis of carbohydrates**
- **Exploring Lipids**
- **Behaviour of Amino acids and Proteins**
- **Enzymes**
- **Nucleic acids**

The course is examined through a series of term tests, practical laboratory write ups, and an end of term exam based on multiple choice questions and essay style questions.

**BY4045 - Cell Biology and Biochemistry**
*ECTS Credits: 6*

**Biological Sciences**

Rationale and Purpose of the Module: To provide a solid understanding and knowledge of fundamental biochemical processes which will underpin an understanding of nutrition, metabolism and exercise physiology.

**Syllabus:**

- **Topic 1:** Carbohydrates; Lipids; Amino acids; Protein; Nucleic acids; Enzymes; Membranes; Muscles; Nerves; Hormones; Metabolism

This is supported by a series of laboratory based practical investigations covering the following areas:

- **Analysis of carbohydrates**
- **Exploring Lipids**
- **Behaviour of Amino acids and Proteins**
- **Enzymes**

The course is examined through a series of term tests, practical laboratory write ups, and an end of term exam based on multiple choice questions and essay style questions.

**BY4204 - Soil Science**
*ECTS Credits: 6*

**Biological Sciences**

Rationale and Purpose of the Module: To introduce students to the basic concepts and principles of human physiology.

On completion of the module students will be able to:
- demonstrate a knowledge of the structure and function of major human physiological systems. Additionally, the influence and relationship between various human physiological conditions and metabolism of nutrients will be considered.

**Syllabus:**

This module will examine the structure and function of the major human physiological systems. Physiology of the blood, circulation and lymphatic systems. The nervous system: central, peripheral and autonomic. Physiology of skeletal, muscle and integumentary systems. The respiratory system: mechanical properties of breathing, pulmonary and bronchial circulation, the transport of oxygen and carbon dioxide. The digestive system: the gastro-intestinal tract, intake and absorption of nutrients. The renal system: kidney structure and function, osmoregulation and homeostasis, regulation of acid balance. The endocrine system: regulation of calcium and phosphate metabolism. Reproductive system: Sensory system: perception of taste and aroma. The influence of physiological conditions on nutrient absorption will be considered e.g. inborn errors of metabolism on iron metabolism. The impact of food constituents on physiology will be examined e.g. ingestion of toxins.

**Prerequisites:** BY4002, BY4001

**BY4215 - Soil Science**
*ECTS Credits: 6*

**Biological Sciences**
Rationale and Purpose of the Module: The purpose of the module is to educate students about the nature, properties and functions of soils with particular reference to soils in Ireland.

Syllabus: 1. Introduction:
2. Physical properties of soil:
   Mineral matter, organic matter, water and air in soil, structure, structural stability and measurement of these, soil water and water movement, soil air, soil temperature.
3. Soil chemistry:
   Soil colloids, cation exchange, soil pH
4. Soils and plant nutrition:
   Nutrient elements, soil testing, availability of elements, soil pH and liming, calcium, magnesium, sulphur and trace elements
5. Soil biology:
   Soil organisms, soil organic matter, C:N ratio
6. Soil genesis and classification (these 5 lectures not taken by Equine Science, who transfer to crop and grassland instead for grassland):
   Factors in soil formation, soil formation in Ireland, soil profiles and horizons, classification and mapping of Irish soils, Great soil groups, series and types, Great soil groups found in Ireland, County soil maps, soils and land use. Functions of compost, compost materials and growth substrates, making an organic compost. Nutrient requirements and deficiencies in horticultural plants & use of artificial and organic fertilisers.
Lab:
Preparing a compost for seeds and a blocking compost
Preparing a compost for actively growing plants
Preparing cuttings composts

CE4007 - WATER MANAGEMENT SYSTEMS
ECTS Credits: 6

Rationale and Purpose of the Module: This module is proposed to enhance the existing water and environmental engineering content and to supplement existing modules in the development of the B.E. in Civil Engineering. The module seeks to train students in the design and modeling of water distribution and water collection systems including hydraulic design of treatment plants and will synthesise the principles learned in the prerequisite modules.

Syllabus: Context and principles of water management from catchment to consumer; structural and hydraulic components of water distribution systems (reservoirs, pump stations, surge tanks) and water / wastewater collection systems (manholes, combined sewer overflows, siphons, pumping stations, attenuation tanks); pipeline construction techniques and their application for specific site and ground conditions; development and use of simple numerical analysis tools for the design and sensitivity analysis of hydraulic systems; analysis and design of water storage and distribution systems, including flow demand, storage requirements, flow pressure and control; analysis and design of surface / wastewater collection systems, including assessment of hydraulic loads, network capacity, flow velocity, sediment transport, design & application of hydraulic structures; hydraulic design of treatment plants; hydraulic profiles; long term economic and sustainability design and operation of hydraulic systems.

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CE4005 - STRUCTURAL THEORY
ECTS Credits: 6

School of Engineering
Rationale and Purpose of the Module: This module introduces the theory and practice of modern water engineering looking at water in the natural Hydrological cycle and the fundamental concepts in water treatment technologies and water supply.

Syllabus: Hydrology: The hydrological cycle; Water balance equation; Hydrologic Budgets; Precipitation: intensity, duration & return periods; Surface run-off and drainage systems; Sustainable urban drainage systems, flow attenuation, Aquifers; Groundwater flow; Measurement and monitoring

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CE4003 - FLUID MECHANICS
ECTS Credits: 3

School of Engineering
Rationale and Purpose of the Module: Aims & Objectives:
Introduce the physical processes which govern the behaviour of liquids at rest and in motion, relating to hydraulic engineering.

Key objectives
* Develop the fundamental principles underlying hydrostatics.
* Introduce hydrodynamic principles and the basic laws of fluid flow.
* Explain pipe flow and network design and basic hydraulic machinery.
* Include theoretical and practical aspects of open channel flows.
* Practical applications of hydraulic principles will be applied to different hydraulic structures to provide experience and confidence in problem-solving.

Syllabus: * Review the properties of Fluids, Hydrostatic forces and Pressure measurement.

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CE4014 - HYDRAULICS AND WATER ENGINEERING
ECTS Credits: 6

School of Engineering
Rationale and Purpose of the Module: This module introduces the theory and practice of modern water engineering looking at water in the natural Hydrological cycle and the fundamental concepts in water treatment technologies and water supply.

Syllabus: Hydrology: The hydrological cycle; Water balance equation; Hydrologic Budgets; Precipitation: intensity, duration & return periods; Surface run-off and drainage systems; Sustainable urban drainage systems, flow attenuation, Aquifers; Groundwater flow; Measurement and monitoring
of stream flow and groundwater; Hydrograph generation run-off, unit, synthetic; Channel Storage; Mass diagrams; Routing flood, reservoir & channel. Water Treatment: Characteristics of water; Water demand rates and peak flows; Distribution systems and service reservoirs; Physical treatment - screening, sedimentation; Clarification and settlement; Filtration with granular media and mechanical; Biological oxidation; Aerobic oxidation plants; Chemical treatment - coagulation, flocculation; Disinfection chlorine, ozone & other; Fluoridation; Sludge dewatering and disposal; Treatment plant design. Applied Hydraulics: Design of water distribution pipe networks, pump types and characteristics, surface profiles and backwater curves, design of hydraulic structures.

Prerequisites: CE4003

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**CE4015 - SOIL MECHANICS**
**ECTS Credits: 6**

School of Engineering

**Rationale and Purpose of the Module:** This module builds on the material covered in WT4014 by further exploring soil mechanics using critical state theory. The course is designed to challenge the student to master the key concepts in soil mechanics and apply these concepts in projects and self-directed learning to achieve the following key objectives:

* To master the concepts of critical state theory.
* To introduce the concepts in the design of un-reinforced concrete and masonry with the following key objectives:

**Key objectives**
- Basic mechanisms of consolidation and 1-D consolidation theory; Solutions and applications for 1-D consolidation; Determination of cv, cc and cs from oedometer tests; Calculation of foundation settlement
- Critical state strength of soil
  - Soil behaviour in shear; Peak, ultimate and residual strengths; Critical states; Undrained strength; Estimation of critical state strength parameters from classification tests
  - Cam clay model
  - Basic features of the cam clay model and its application in computer predictions of soil behaviour; State boundary surface; Yielding and hardening

**Prerequisites:** WT4014

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**CE4027 - ADVANCED STRUCTURES**
**ECTS Credits: 6**

School of Engineering

**Rationale and Purpose of the Module:** Module modified to reflect movement of more advanced topics from earlier structural engineering modules. This provides students with the opportunity to study the key concepts in pre-stressed concrete and steel structures.

**Syllabus:** Structural scheme design of specialist structures - examples include grandstand, hospital, high-rise, long-span, reservoir, etc. Overall stability of structural schemes. Preliminary sizing of structural components in a variety of materials. Suitability of different structure types / components. Communication of concepts using hand sketches and oral presentations. Detailed design and detailing of structural components for a specialist structure therefore typically two of the following component types: pre-stressed and post-tensioned concrete; water retaining concrete; steel-concrete composite; steel plate- and box- girders; Long span components with stiffness critical design criteria.

**Prerequisites:** CE4015

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**CE4033 - MODELLING AND ANALYSIS OF FLUID SYSTEMS**
**ECTS Credits: 3**

School of Engineering

**Rationale and Purpose of the Module:** The purpose of this module is two-fold. Students are introduced to scale analysis techniques and taught how to interpret and use existing correlations, as well as develop their own from experimental data. Secondly, students are introduced to the concept of potential flow and apply the theory to solve various problems commonly encountered by civil engineers.

**Syllabus:** Introduction to dimensional analysis/scale analysis/similarity analysis; comparison with design of experiments; conditions of similarity; derivation of dimensionless parameters; overview of dimensionless groups commonly employed in engineering; reading correlations and extracting useful data; derive correlations from experimental data; flow structures and transition regimes.

Introduce conservation equations; concept of potential flow; streamlines and equipotential lines; stream functions, point/line sources and sinks; flow around bodies and corners; superposition theory; flow nets.

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**CE4035 - REINFORCED CONCRETE AND MASONRY DESIGN**
**ECTS Credits: 6**

School of Engineering

**Rationale and Purpose of the Module:** This module introduces the design of structural elements in reinforced concrete and masonry with the following key objectives:

Key objectives
- To master the concepts of design in steel reinforced concrete.
- To develop the key concepts in pre-stressed concrete design.
- To introduce the concepts in the design of un-reinforced and reinforced masonry.

**Syllabus:** Properties of reinforced concrete (RC); Principles of limit state design; Analysis of the RC section; stress-strain characteristics of steel and ultimate strain of concrete, stress block and strain profile, balanced, over- or under-reinforced sections; Design of single span, flanged and continuous RC beams; flexure and shear resistance; Serviceability and durability of reinforced concrete; Limiting span/effective depth ratios; Choice of appropriate RC slab type; Design of RC slabs, one-way,
two-way and flat slabs; Punching shear resistance; Design of RC Columns, design formulae and design standard procedure for short/slender columns, principles of axial load-moment interaction diagram, balanced failure design, load and moment analysis; Design of RC retaining walls and foundations; RC Detailing; bondage, anchorage and curtailment.

Design of unreinforced masonry subjected to vertical and lateral loading.

Introduction to pre-stressed and post-tensioned concrete technology.

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CE4045 - PROFESSIONAL PRACTICE 1
ECTS Credits: 6

School of Engineering

Rationale and Purpose of the Module: The objective of this module is to engage the student in professional practice skills through the medium of problem-based learning. The module involves an overview of Health and Safety in the construction industry and project work integrates core skills in CAD and land surveying in advance of cooperative education in semester 6.

The module is 100% continually assessed and non-repeatable.

Syllabus: The Planning System: Making a simple planning application.

Health & Safety: Overview of health & safety in the construction industry. Roles and responsibilities of the civil engineer. Processes and procedures, risk assessments.

Computer Aided Drafting: Overview of current industry practice and trends in drawing and integration of CAD with the design process. Operate a proprietary 2-D CAD system to produce survey and planning drawings. Operate a proprietary 3-D CAD system to produce a rudimentary 3D model and associated plan and sections.

Land Surveying: Overview of land surveying methods and principles. Overview of GIS. Surveying and setting out using total station and levelling equipment operation, data recording and production of a topographical survey drawing. Setting out of a simple building.

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CE4047 - WIND, OCEAN AND HYDRO ENERGY
ECTS Credits: 6

School of Engineering

Rationale and Purpose of the Module: The purpose of this module is to introduce civil engineering and energy students to national and EU policy, resource assessment, conversion principles and electricity generation potential associated with renewable energy generated from wind, ocean & hydro resources. This will equip students with the knowledge and analytical skills necessary to advise on their appropriate use at specific sites.

Syllabus: Wind Energy Onshore & Offshore: Market status and current trends; Site and Resource Assessment; Supporting Structures; Aerodynamic and Power Conversion Principles; Power Predictions with Statistical Analysis; Economic Assessment with review of National and EU policy; Storage Mechanisms

Hydro-Energy: Market Status and Current Trends; Catchment Areas; Dams; Weirs; Hydrodynamic and Power Conversion Principles; Environmental Impact; Layout of Hydro Power Systems; Power Output; Economic Assessment; Peak Load Management


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CE4205 - MICROCOMPUTER SYSTEMS
ECTS Credits: 6

Electronic & Computer Engineering

Rationale and Purpose of the Module: This module is designed for 'transferee students'. Students must be capable of writing programs at assembly language level for some modern computer or microprocessor.

The main purpose is to:
1. Teach 8086 assembly language programming.
2. To introduce operating system design and implementation concepts based on a complete single-user, disk based operating system. MS-DOS and Microsoft Windows will be the example operating systems.


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CE4607 - COMPUTER NETWORKS 1
ECTS Credits: 6

Electronic & Computer Engineering

Rationale and Purpose of the Module: This module provides a unified view of the field of computer communications and networks. The module seeks to introduce and examine the main issues in current networking technology and computer networks. The module is divided into the following sections: Introduction to computer networks, networking protocols, networking architectures, current networking technologies and applications.

Syllabus: * [Introduction to Data and Computer Communications] Communications tasks; Protocol elements, characteristics, and functions; Protocol architectures; Reference communications models overview: OSI vs. TCP/IP (layers/E description and functions, PDU encapsulation).
* [Physical Transmission] Transmission modes (simplex, half duplex, full duplex) and transmission types (baseband, broadband); Analogue and digital signals; Transmission impairments (attenuation, delay distortion, noise); Channel capacity; Data encoding and modulation; Physical interfacing; Asynchronous & synchronous transmission; Transmission media; Multiplexing techniques (FDM, TDM, WDM).
* [Link-by-Link Communication] Line disciplines (ENQ/ACK, poll/select); Framing; Frame synchronization & data transparency, Flow control; Error control; Addressing; Link management; Protocol examples (character-oriented, byte-count, bit-oriented).
* [Network Services] Switching (circuit-, message-, packet switching); Addressing (classful vs. classless IP addressing); NAT operation (static and dynamic); IP subnetting and supernetting; Routing (concepts and principles; routing algorithms: SPF flooding, static, dynamic; central and distributed control; distance vector vs. link...
state routing; hierarchical routing; routing protocols examples: interior vs. exterior; Congestion control; QoS provision; IP protocol: main functions and operation (IPv4 vs. IPv6); Mobile IP; Address resolution with ARP and RARP; Internet multicasting (MBone operation) and group management (IGMP protocol); Control and assistance mechanisms (ICMP protocol: v4 vs. v6). Modular design of protocols.

* [Transport Services] Overview (connection-oriented vs. connectionless; segmentation and re-assembly; end-to-end delivery, flow control & buffering; crash recovery); Unreliable datagram transport with UDP; Real-time transport with RTP and RTCP; Reliable connection-oriented transport with TCP and SCTP; Wireless TCP; Modular design of protocols.

* [End-to-End Communication] Session management (SIP and SDP protocols); Data presentation (ASN.1 and NVT); Client-server communication model; Domain Name System (DNS); TCP/IP configuration: static (BOOTP protocol) vs. dynamic (DHCP protocol); Terminal networking with Telnet; File transfer with FTP and TFTP; E-mail service (SMTP, POP, IMAP protocols); Browsing with HTTP; Network management with SNMP.

* [Practical Implementation] Building and testing different types of patch cables; Serial interface configuration; Device configuration: IOS software, managing configuration files, updating software; Router configuration: initialisation, commands and modes of operation; Routing protocols/E configuration, operation and evaluation: RIP, IGRP etc.; Network configuration: testing established connectivity and routes. Analysing and interpreting IP addresses and subnets; Scaling the IP address space: CIDR, private addressing, secondary IP addressing, MTU and fragmentation; NAT configuration; TCP/IP protocols configuration and operation.

Prerequisites: EE4616

**CE4701 - COMPUTER SOFTWARE 1**  
ECTS Credits: 6

Electronic & Computer Engineering  
Rationale and Purpose of the Module: Introduce students to a high level object-oriented programming language and its software development environment  

Syllabus: The focus of this module is to introduce a modern high level object-oriented programming language to enable the student to develop the programming skills necessary to write simple but useful applications. The following topics will be covered:

- Introduction to software development.
- Short comparative study of different programming languages.
- Simple program design techniques e.g. flowcharts.
- Basic data types, control statements, methods, scope.
- Relationship between the program, the run time environment and the operating system.
- Introduction to programming language documentation.
- Introduction to Class Libraries.
- Interactive Development Environments.
- Introduction and demonstration of a low level graphics toolkit.
- Basic test practices and test case definition.

Rationale and Purpose of the Module: To introduce the domain of software engineering from a programmers perspective focusing on object oriented analysis, design and programming.  
- To revisit and develop existing computer software skills and competence.
- To emphasise good Software Engineering Practices
- To enhance individual and team working skills


Prerequisites: CE4704

**CE4703 - COMPUTER SOFTWARE 3**  
ECTS Credits: 6

Electronic & Computer Engineering  
Rationale and Purpose of the Module: To introduce the student to algorithms and dynamic data structures (e.g. queue, trees, and dynamic arrays).

Syllabus: The following will be covered:

- Algorithms
- Growth of functions
- Data structures - Linked lists, Stacks, Queues and Red-Black Trees.
- Greedy Algorithms
- Hash functions and search minimisation techniques
- Class/Object unit testing
- Analysis of algorithms
- Case study/Project

Prerequisites: CE4702

**CE4706 - SOFTWARE ENGINEERING 1**  
ECTS Credits: 6

Electronic & Computer Engineering  
Rationale and Purpose of the Module: To provide the student with a solid grounding in the theoretical and practical foundations of artificial intelligence and expert systems.

Syllabus: Section (i) - Introduction to Prolog and "Logic Programming"  
- Section (ii) - State-Space Search  
Admissibility, Monotonicity, Informedness.

Section (iii) - Expert Systems

Section (iv) - Neural Networks

Prerequisites: EE4817

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CG4001 - PROCESS ENGINEERING COMPUTATION METHODS
ECTS Credits: 6

Chemical Sciences


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CG4003 - BIOPROCESS ENGINEERING 1
ECTS Credits: 6

Chemical Sciences


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CG4007 - SUSTAINABLE ENERGY PROCESSES
ECTS Credits: 6

Chemical Sciences

Rationale and Purpose of the Module: To give students knowledge and understanding of (i) methods for estimation of pure component properties, (ii) methods for correlation and prediction of phase equilibria, and (iii) the thermodynamics of energy conversion cycles.

Syllabus: Application of the first and the second law of thermodynamics in chemical engineering: identify and describe open and closed systems; conditions and limitations for conversion between different kinds of energy; describe the theoretical energy conversion processes of Carnot-, Rankine- and Brayton, and understand the differences with their corresponding technical applications: steam turbines, gas turbines, cooling machines and heat pumps. Fundamental thermodynamics of phase equilibria and methods of correlation and prediction: understand standard states and the use of activity and fugacity coefficients, understand the use and limitations of models for correlation and prediction of excess free energy and activity coefficients.

Application of chemical thermodynamics to reaction engineering: spontaneity of chemical reactions, chemical reaction equilibrium, equilibrium conversion calculations.

Methods of correlation and prediction of physical properties for chemical engineering calculations. Availability and application of electronic data bases for physical properties, and software for prediction of physical properties.
Heat transfer in biochemical systems. Heat exchanger design in bioprocessing units.

Bioreactor sizing and design for the following reactor types: fed batch, stirred fermenter, bubble column, airlift, packed bed, fluidised bed, trickle bed, and perfusion. Bioreactor scale-up. Operation and feeding regimes: chemostat with recycle, fed batch operation, and multistage reactors. Control methods: feedback, indirect metabolite control, programmed control, and emerging AI-based methods. Modelling and simulation of bioreactors.

Bioreaction product separation processes including: cell disruption, solvent extraction, adsorption, filtration, and centrifugation.

Final product purification methods: gel filtration, process chromatography, protein crystallisation, spray drying, and lyophilisation.

Regulatory and licensing systems in the pharmaceutical, biopharmaceutical, and biotechnology industries.

CG5011 - PRINCIPLES OF CHEMICAL ENGINEERING
ECTS Credits: 6

Chemical Sciences

Rationale and Purpose of the Module: To allow students with varying backgrounds to become familiar with those core aspects of chemical engineering that might be lacking in their prior experiences. Tutorials are tailored to the previous academic background of the individual student.

Syllabus: Fundamentals of material and energy balances. Introduction to chemical process design and analysis. Introduction to Process Control and Instrumentation. Solid Materials Handling (size reduction, settling, elutriation, filtration, etc.)

Among typical tutorial topics are the following:
Review of Introductory Inorganic and Organic Chemistry
Review of Chemical or Engineering Thermodynamics
Review of Chemical Kinetics

CG5031 - CHEMICAL ENGINEERING DESIGN METHODS 1

ECTS Credits: 6

Chemical Sciences

Rationale and Purpose of the Module: To introduce the student to quantitative design methods and procedures.

To develop skills in process flowsheeting and in the use of an industry-standard computer package for modeling/simulation of steady state and non-steady state chemical processing operations

To learn methods for industrial energy management and become familiar with their application in industrial operations.

To become familiar and apply concepts and principles of health and safety.

To give the student a thorough grounding in the principles and application of HAZOP methods.

To provide a working knowledge of environmental impact and sustainability assessment, as applied to chemical processing operations.

Syllabus: Review of quantitative design methods. Thermodynamic options for process design and simulation. Procedures for sustainability assessment of industrial processes including the sustainability metrix as prescribed by the professional organisation IChemE.


Industrial process simulation and sensitivity analysis of chosen design process. Graphical presentation.

Flow sheet synthesis, analysis and evaluation: modular- and unit equation-based modes for flowsheet synthesis; rigorous unit equation models for flash, distillation, and heat exchange operations. Recycle of process mass and energy streams; partitioning, precedence ordering and tearing; convergence criteria. Synthesis of separation systems: ideal distillation; azeotropic mixtures; distillation sequences.

Use of industry-standard computer package for modeling/simulation of steady state and non-steady state chemical processing operations.

Main design project selection. Preparation of preliminary mass and energy balances for main design project.
CH4001 - CHEMISTRY FOR ENGINEERS
ECTS Credits: 3

Chemical Sciences

Rationale and Purpose of the Module: Many students that enter the University of Limerick to study engineering courses do not have chemistry as a leaving certificate subject. The rational of this module is to introduce all students to some basic concepts in Chemistry. More specifically:

i. To give students an understanding of the fundamental concepts of modern chemistry.
ii. To familiarise the student with the various reaction concepts of modern chemistry.
To familiarise students with the various applications of chemistry in everyday life.

Syllabus: Simple characterisation of atoms and molecules: basic atomic structure, ions and isotopes, atomic and molecular weights, the mole concept.

- Early chemical concepts and their present day uses: e.g. Dalton Atomic Theory, Avogadro's Law, Oxidation and reduction.

- Introduction to chemical bonding. Bond representation by Lewis dot, valence bond and molecular orbital theories.
- Classification of chemical reactions. The Electrochemical Series.
- Chemical equilibrium. Liquid solution chemistry. Acids and bases.
- Selected applications of chemistry in domestic, medical and industrial environments.

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CH4002

Syllabus: - Reaction Process, role of thermodynamics
- Arrhenius equation, collision theory, activated complex theory
- Mechanism of reaction, steady state approximation
- Lindemann hypothesis, role of equilibria
- Photochemistry, fast reactions, polymerisation reactions
- Michaelis-Menten kinetics
- Catalysis
- Langmuir adsorption isotherm
- Applications to selected examples of industrially important reactions

Prerequisites: CH4002

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CH4005 - PHYSICAL CHEMISTRY 4
ECTS Credits: 6

Chemical Sciences

Rationale and Purpose of the Module: To build on the functional group chemistry covered in CH4102, CH4103 and CH4104. To impart to the student a detailed understanding and working knowledge of the applied use of organic compounds as pesticides and as medicinal drugs and on the synthesis of selected structures.

Syllabus: Insecticides: The role of acetylcholine and acetylcholinesterase (AChE) in nerve impulse transmission; organophosphates and carbamates: Malathion, parathion and carbaryl, synthesis, mode of action as inhibitors of AChE.

- Herbicides: 2,4,5-T and 2,4-D, synthesis, nucleophilic aromatic substitution reactions, dioxin formation; mode of action as auxin analogs.
- Antibiotics: sulphonamides, synthesis, mode of action; penicillins: role of transpeptidase enzymes in bacterial cell wall synthesis, mode of action of penicillins as inhibitors of transpeptidase enzymes, synthesis of semi-synthetic penicillin stuctures.

Surface analysis techniques, atomic force microscopy, scanning tunneling microscopy, scanning electrochemical microscopy.

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CH4007 - ORGANIC PHARMACEUTICAL CHEMISTRY 1
ECTS Credits: 6

Chemical Sciences

Rationale and Purpose of the Module: To build on the functional group chemistry covered in CH4102, CH4103 and CH4104. To impart to the student a detailed understanding and working knowledge of the applied use of organic compounds as pesticides and as medicinal drugs with an emphasis on mode of action at the molecular level and on the synthesis of selected structures.

Syllabus: Analgesic and antiarthritic compounds: aspirin, ibuprofen...
and naproxen, synthesis of naproxen, resolution and racemisation aspects. Review of functional group chemistry.

Prerequisites: CH4007

CH4013 - ORGANIC CHEMISTRY
ECTS Credits: 6

Chemical Sciences

Rationale and Purpose of the Module: To introduce the student to fundamental aspects of organic chemistry and the different families of compounds: their nomenclature, structure (2D and 3D) and isomerisation (if any). To highlight the functional group of each family and relate structure to reactivity; to examine associated reactions/reaction mechanisms of the different functional groups; to introduce aromatic chemistry and study the chemical behaviour of aromatic compounds; to highlight current trends and applications in the areas of organic chemistry.

To carry out practical work to support and reinforce some of the theoretical aspects encountered; to encourage self-directed learning through the use of software and web sources.


Haloalkanes: Structural formulae; Nomenclature; Substitution/Elimination Reaction Mechanisms- SN1, SN2; E1, E2.

Alcohols/Ethers: Structural formulae; Nomenclature; Classification; Physical properties; Occurrence and Uses. Alcohols only: - Acidity; Preparation; Reactions: Oxidation, Esterification.

Aldehydes/ Ketones: Structure & Basicity of the Carbonyl Group; Nomenclature; Properties; Preparation; Typical Carbonyl Group Reactions (Nucleophilic Addition Reactions); Imine formation; Reaction with Grignard Reagents; Synthesis; Occurrence/Applications.

Carboxylic Acids and Carboxylic Acid Derivatives: - Esters, Acyl Halides, Acid Anhydrides and Amides. Functional Group; Nomenclature; Physical Properties; Acidity of the Carboxyl group; Preparation; Nucleophilic Acyl Substitution Reactions (Simple Carboxylic Acids and Esters only).

Amines: Classification; Aliphatic and Aromatic Amines; Reactions; Occurrence.


CH4015 - ORGANIC CHEMISTRY 4
ECTS Credits: 6

Chemical Sciences

Rationale and Purpose of the Module: To describe the main methods of polymer production relating synthesis detail to chain architecture. To explain the molecular basis of structure-property relationships in polymers. To develop an understanding of the structure and function of proteinaceous biopolymers.


CH4021 - LABORATORY CALCULATIONS
ECTS Credits: 3

Chemical Sciences

Rationale and Purpose of the Module: Many students entering the University of Limerick to study science courses do not have chemistry as a leaving certificate subject. Given that by its nature chemistry is a very conceptual subject, the rationale for this module is to introduce all students to some of the more basic concepts in fundamental chemistry and appropriate calculations associated with common laboratory practice.

Syllabus: Valency- the periodic table, valency as applied to the periodic table grouping, combining atoms to form molecules. Common Ions & Molecules- sulphates, chlorides, nitrates, phosphates, hydrochloric acid, sulphuric acid, nitric acid, phosphoric acid, acetic acid, sodium hydroxide, sodium carbonate, sodium chloride. Moles-The Moles triangle, grams, moles, gas volume, molecules, interchangeability of grams, volume and number of molecules through moles. Concentrations- moles, molarity, percentage solutions, volume over volume, weight over volume, parts per million, parts per billion, conversion of one form of unit to another. Serial Dilutions- moving between concentrations, dilutions. Acids/Bases- balancing equations-titrations and titration calculations. Redox Reactions- balancing equations-titrations and titration calculations. pH -strong acids, strong bases, weak acids and weak bases, dissociation of acids and bases, solution pH, pOH.

Prerequisites: CH4701, CH4711, CH4721

CH4051 - INTRODUCTION TO APPLIED CHEMISTRY AND BIOCHEMISTRY
ECTS Credits: 3
Chemical Sciences

Rationale and Purpose of the Module: To introduce the student to the disciplines of Applied Chemistry and Industrial biochemistry. To provide the student with a reference framework for future core course modules. To generate student interest and enthusiasm for the subject areas by focusing upon relevant, topical issues of broad public interest

Syllabus: Importance of chemical and biopharmaceutical industry globally and use of fundamentals relating to chemistry and biochemistry underpinning consumer chemicals (such as detergents, shampoos, cosmetics etc), pharmaceuticals (eg aspirin, paracetamol, penicillin), oil industry (diesel, petrol, tars) and semiconductor industry (materials and processes involved in silicon processing and etching for microchip devices) as well as biopharmaceuticals, such as antibodies, insulin and other proteins.

Chemistry: Case studies where chemistry has solved major problems e.g developments in glass manufacture that makes iphones possible, the advances in synthetic chemistry that allowed antibiotics to be produced at a global scale; the fundamentals of chemistry in polymers and polymeric processes; the chemistry of how aluminium is produced from bauxite and chemistry that makes lithium ion batteries possible. Analytical chemistry and its role in forensics; The role of an industrial chemist in a work environment.


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CH4055 - ENVIRONMENTAL CATALYSIS
ECTS Credits: 6

Chemical Sciences

Rationale and Purpose of the Module: To introduce catalysts and catalytic processes to students, with particular emphasis on end-of-pipe technologies for the control of gaseous pollutant from flue gasses.

To present on overview of procedures for the preparation and characterisation of catalysts, in particular catalysts relevant for the conversion of polluting substances into more environmentally acceptable components.

Syllabus: Introduction to catalysis, Defining the environmental problem, Catalyst structure and preparation. Study of various end-of-pipe technologies including deNOx from stationary sources, deNOx from mobile sources (petrol and diesel), destruction of VOCs, SO2 control. Catalyst characterisation: Surface area analysis, Elemental analysis, XRD and XPS.

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CH4103 - ORGANIC CHEMISTRY 2A(1)
ECTS Credits: 6

Chemical Sciences

Rationale and Purpose of the Module: To build on the functional group chemistry covered in CH4102. To extend the students comprehension and working knowledge of functional group chemistry; to expand the range of reagents, reactions and associated mechanisms. To establish a foundation in stereochemistry and to develop the students understanding of its relevance to organic reactions.

Syllabus: Aldehydes and ketones (Part 2): Carbon-based nucleophiles continued Û Wittig reaction and enolate anions; Aldol and Claisen condensation reactions; alkylation at the α-position. Carboxylic acids: methods of preparation; using pKa as a measure of acid strength; formation of derivatives such as acid chlorides and esters. Carboxylic acid derivatives Û acid halides, anhydrides, esters and amides; nucleophilic displacement reactions; Aromatic structure and reactivity (Part 1): defining aromaticity and understanding aromatic stabilization; HückelÆs rule; electrophilic aromatic substitution reactions; Stereochemistry: defining and naming chiral centres, enantiomers, diastereomers and meso forms; Fisher projections; understanding the stereochemical course of SN1 and SN2 reactions; applying use of stereochemistry and kinetic measurements to deduce the nature of a chemical reaction pathway.

Prerequisites: CH4103

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CH4153 - ORGANIC CHEMISTRY 2B
ECTS Credits: 6

Chemical Sciences

Rationale and Purpose of the Module: To build on and extend the functional group chemistry initiated in CH4152; develop the associated reactions/reaction mechanisms of the various functional groups; to cover, in depth, aromatic chemistry and the chemical behaviour of aromatic compounds; to introduce the field of stereochemistry; to carry out practical work to support and reinforce some of the theoretical aspects encountered; to encourage self-directed learning through the use of software and web sources.

Syllabus: Syllabus: Functional Group Chemistry Ctd; Aromaticity; Stereochemistry; Kinetics: Aldehydes and Ketones: Typical Carboxyl Group Reactions (Nucleophilic Addition Reactions); Imine formation; Reaction with Grignard Reagents; Reduction Rxns; Wittig Rxn; Synthesis; Occurrence and Applications. Carboxylic Acids and Carboxylic Acid Derivatives: - Esters, Acyl Halides, Acid Anhydrides and Amides. Nomenclature; Physical Properties; Acidity of the Carboxyl group; Preparation; Nucleophilic Acyl Substitution Reactions; Interconversion of Carboxylic Acid Derivatives; Reduction Rxns; Pharmaceutical Applications. Fats, Oils, Soaps, Detergents; Current Trends. Amines: Classification; Aliphatic and Aromatic Amines; Heterocyclic Amines; Basicity; Reactions; Occurrence.
Chemistry of the lanthanides and second and third row transition metals. Properties of first row transition metals. Comparison of spectroscopic properties. Reaction mechanisms.

Complexes: structure, isomerism, magnetic and transition metals. Hard and soft acids.

Electrode potential diagrams. Comparison of main group and transition metals. Polarising power. Chemistry of hydrogen and s and p block elements group by group.

Prerequisites: CH4122

CH4253 - INORGANIC CHEMISTRY 2B
ECTS Credits: 6

Chemical Sciences

Rationale and Purpose of the Module: To describe and explain the main features of the chemistry of the main group elements (s and p block) in relation to position in the Periodic Table, and to understand the principles underlying the chemistry of metallic elements in the s-, p-, d- and f- block elements and to describe and explain the main features of this chemistry in relation to position in the Periodic Table. - To introduce students to the chemistry of transition metal complexes

Prerequisites: CH4701, CH4252

CH4403 - ANALYTICAL CHEMISTRY 1A
ECTS Credits: 6

Chemical Sciences

Rationale and Purpose of the Module: To give the students an understanding of and an appreciation for the qualitative and quantitative aspects of analytical chemistry through a working knowledge of the theory and applications of spectrophotometry and spectroscopy.

Syllabus: The analytical process, measurements and experimental error, fundamentals of spectrometry, Beer-Lambert law, applications of spectrometry, spectrometers, atomic spectroscopy, calibration and analytical methods, infrared spectroscopy, modes of stretching and bending, fourier transform ir, correlation charts for ir, functional group survey, nmr basic concepts, chemical shift & shielding, Pulsed FT nmr, integration, spin-spin splitting in 1H spectroscopic constants, combined ir/1Hnmr spectra interpretation.

Prerequisites: CH4303
CH4405 - PROCESS TECHNOLOGY 2
ECTS Credits: 6

Chemical Sciences

Rationale and Purpose of the Module: The Process Technology 2 semester course is a continuation of Process Technology

To provide the student with a broad understanding of the principles of fluid flow and momentum transfer. To acquaint the student with the significance of particle-fluid interaction in processing operations. To enable the student to develop expertise in the analysis and design of heat transfer processes


Prerequisites: CH4404

CH4407 - PROCESS TECHNOLOGY 4
ECTS Credits: 6

Chemical Sciences

Rationale and Purpose of the Module: - To provide the student with a broad understanding of the principles of mass transfer and its applications
- To enable the student to develop expertise in the analysis and design of separation processes.
To give the student practical experience in the operation of separation processes.


Separation operations, vapour-liquid systems, plate and packed columns, McCabe - Thiele plots, equilibrium stages, stage efficiencies, HETP and HTU.NTU approaches to packed column design. Distillation continuous and batch. Gas absorption and stripping. Use of triangular composition diagrams, leaching and liquid - liquid extraction, mixer-settlers. Evaporation, forward and back-feed operation, efficiency.

Prerequisites: CH4403, CH4404, CH4405, CH4405, CH4415

CH4417 - PHARMACEUTICAL FORMULATION
ECTS Credits: 6

Chemical Sciences

Rationale and Purpose of the Module: To draw on a knowledge of basic physical chemistry and chemical unit operations in order to understand the efficient design and formulation of medicines as well as the manufacture of these medicines on both a small (compounding) and a large (pharmaceutical technology) scale.

Syllabus: Physical Chemical principles of dosage from design
Particle science & powder technology
Biopharmaceutics
Dosage form design & manufacture

Prerequisites: CH4003, CH4004, CH4005, CH4405, CH4415

CH4701 - GENERAL CHEMISTRY 1
ECTS Credits: 6

Chemical Sciences

Rationale and Purpose of the Module: Many students that enter the University of Limerick to study science and engineering courses do not have chemistry as a leaving certificate subject. The rational of this module is to introduce all students to some basic concepts in Chemistry. More specifically:
To give students an understanding of the fundamental concepts of modern chemistry.
To familiarise students with the various applications of chemistry in everyday life.
To develop the basic laboratory skills associated with practical chemistry.

Syllabus: Simple characterisation of atoms and molecules: basic atomic structure, ions and isotopes, atomic and molecular weights, the mole concept. Early chemical concepts and their present day uses: e.g. Dalton Atomic Theory, Avogadro's Law, Oxidation and reduction. Chemical nomenclature. Modern theories of atomic and molecular structure. Quantum mechanical description of the atom: Schroedinger Wave Equation, atomic orbitals and quantum numbers.


CH4901 - SCI FDN 1, CHEM, BIOCHEM AND PHYS FOR NURSING AND MIDWIFERY
ECTS Credits: 3

Chemical Sciences

Rationale and Purpose of the Module: The purpose of this module is to provide the student with a fundamental
understanding of Chemistry, Biochemistry and Physics in relation to the study of health and illness.

Syllabus: (a) Chemistry
Coverage of selected aspects of atoms, molecules, bonding, chemical reactions, acids, bases, ph. Chemistry of body fluids. Solutions, suspensions, osmosis and diffusion.
(b) Biochemistry
The structure and function of proteins, carbohydrates and lipids, nucleic acids, enzymes, metabolism, metabolic pathways, cholesterol, hormone function, will be examined.
(c) Physics
Coverage and application to Nursing and Midwifery of selected aspects of matter, gravity, motion, pressure, heat, light, electromagnetic spectrum; including UV and X-rays, radioactivity, diagnostic radiology, ECT

CM4203 - COMMUNICATIONS
ECTS Credits: 6

Management and Marketing
Rationale and Purpose of the Module: This module facilitates students in thinking strategically about communication. It aids them in improving their written, presentation and interpersonal communication skills. The module examines a set of 'best practices' or guidelines that have been derived from both research and experience. It gives students the opportunity to put those guidelines into practice and encourages them to reflect on the role of communication in personal, academic and business contexts.

Syllabus: This module introduces Communications in personal, academic and professional contexts. Students are introduced to communication theory and develop their practical communication skills. Topics covered include the following: the communication process; culture and intercultural communication; interpersonal communication including listening and feedback skills; understanding conflict and its impact on communication; referencing and library skills; non-verbal communication; presentation skills; communication channels, contexts, strategies and audiences.

SCIENTISTS 1
ECTS Credits: 6

Computer Science & Information Systems
Rationale and Purpose of the Module: To provide the student with a practical and comprehensive set of skills for the acquisition, management, manipulation, and presentation of scientific information. This module is entirely practically based, with the emphasis on information technology applications in the areas of chemistry, biochemistry, environmental science and health & safety.

Syllabus: - Scientific literature retrieval - use of Internet/Intranet databases e.g. Science Direct, ASTI, Medline, Ullmanns and OHSIS.
- Presentational skills: (i) Scientific drawing - use of a chemical drawing package (e.g. ChemSketch) to produce 2- and 3-d representations of molecular structures; (ii) Scientific graphing - use of e.g. Advanced Grapher to create professional quality graphs. Computer-aided audio-visual presentations using MS Powerpoint.
- Rudiments of spreadsheets: entering names, numbers and formulas into cells; calculations and simple formulae; display of equations in the spreadsheet; editing, deleting, copying and pasting cell contents; formatting cells in a spreadsheet; relative and fixed (absolute) cell references; ordering data within spreadsheets; creating and embedding charts and graphs; saving and formatting for printing;
- Built-in functions for summarizing and evaluating data e.g. count, sum, minimum, maximum, average, mode, median, standard deviation, frequency, permutations and combinations, geometric mean, harmonic mean, probability and distributions, regression analysis;
- Descriptive statistics: ranking by percentile, calculating moving averages, exponential smoothing, generating random numbers, sampling data;
- Importing and Exporting Data: Import/export data from/to another file, e.g. a text file, a web page.
- Pivot tables and pivot charts;
- Creating Macros;
- Introduction to Visual Basic for spreadsheet applications in chemistry, biochemistry, environmental science and health & safety.

Computer Science & Information Systems
Rationale and Purpose of the Module: The aim of the module is to gain an understanding of the social and cultural implications of new media. The impact new media have had on information sharing, processing and the changes on cultural attitudes and practices new media provoked. The course should also introduce students to the body of literature regarding social theory and new media and to the current research studying the impact of new communication technologies into our everyday lives.

Syllabus: Constituent elements of the course will be:
- definition of basic conceptual tools to understand research issues on media, and specifically new media
- discussion of the main theoretical frameworks developed for interpreting the social impact of new media
- critical analysis of the relationships between new media and their economical, organisational and cultural implications
Particular attention will be devoted to understanding communication technologies and technical innovations that contributed to shape the existing system of media, particularly with respect to the way media are perceived and internalised into the social community. A specific part will be focusing on the study of the features of new emerging media (e.g. internet agents, distributed systems, intelligent environments) and the probable future social impact of these new communication technologies on culture.

CS4006 - INTELLIGENT SYSTEMS
ECTS Credits: 6

Computer Science & Information Systems
Rationale and Purpose of the Module: The purpose of this module is to familiarise students with a targeted subset of the principles and methods of Artificial Intelligence and Intelligent Systems. Given that students from a number of programmes will be taking this module, examples and projects work will be relevant to each group of students in so far as possible

Syllabus: To provide students with an understanding of the basic principles, methods and application domains for Artificial Intelligence. To introduce students to the development of Intelligent Systems, Knowledge Representation, and Machine Learning.

CS4003 - Information Society 1: Social Theories of New Media
ECTS Credits: 6
This module introduces the history and development of Intelligent system concepts. It includes discussions on AI and Expert Systems, Heuristic Search, Evolutionary Algorithms, Artificial Neural Networks, Cognitive Science, and issues in representation, reasoning and machine learning, together with a set of design principles for intelligent autonomous agents.

Real world applications of the course topics are also presented in areas such as robotics and financial prediction.

CS4007 - Information Society 2: The Information and Knowledge Society
ECTS Credits: 6

Computer Science & Information Systems

Rationale and Purpose of the Module: This module offers a socio-economic, political and cultural exploration of the "internet society". The course will provide a series of perspectives on the network society, examining its conceptual foundations, critiquing its more polemical exponents, and subjecting the claims of the electronic sublime to critical scrutiny. This module will help students understand some of the current debates in the media about the effects of information and communications technology on society.

Syllabus: This module will examine the claims of those who argue for the emergence of a radically new Information Society, as against those who see the emerging society as being fundamentally a continuation of existing socio-economic forces. The differing perspectives of technological determinism and social determinism will be examined. More nuanced frames for understanding human-technology relations, such as actor-network theory, will also be examined. These issues will be explored through practical examination of such areas as e-learning, e-commerce, e-communities, and virtual worlds. The emergence and use of the Internet will be one major theme of this module. This module will embody a strong historical perspective, examining earlier technological developments, e.g. electricity, and first-order, second-order and third-order effects. The notion of "information ecologies" will be examined, as well as the current debate about the "knowledge society".

CS4012 - REPRESENTATION AND MODELLING

ECTS Credits: 6

Computer Science & Information Systems

Rationale and Purpose of the Module: This module aims to provide students with an understanding of how different kinds of phenomena are represented as digital information. Its objectives are to give students an appreciation of the role of software in rendering and manipulating digital representations, and an introduction to the skills and techniques of abstract representation (modelling) of social and economic phenomena.

Syllabus: What is a representation? the represented world, the representing world and the mapping between the represented and representing world; intrinsic versus extrinsic mappings;

Representing information in various forms of media (images, graphics, video, audio and text); characteristics of multimedia data; hypertext and hypermedia; document content and structure; content model; semantic structure; metadata and metatags; modelling media objects; modelling correlations among media objects; simulation versus animation;

What is a model? model criteria: mapping criterion, reduction criterion, pragmatic criterion; models versus real systems; abstraction and similarity; iconic, analogic and symbolic models; static and dynamic models; descriptive and prescriptive models; metaphor as a special type of model; purposes of models;

Analyzing social, biological and business phenomena, in order to design and construct models of those phenomena, using spreadsheets and databases;

Models in software development; use of descriptive and prescriptive models; risks associated with model usage; formal approach to building models; problem conceptualization; collection and examination of data; model structure, content and layout; development and use of macros; model validation and documentation; developing model templates.

Prerequisites: CS4411

CS4013 - OBJECT ORIENTED DEVELOPMENT
ECTS Credits: 6

Computer Science & Information Systems

Rationale and Purpose of the Module: On successful completion of this module students will be able to identify, design, code and construct systems using inheritance hierarchies, encapsulation and polymorphism to solve specified programming problems.

Syllabus: Key terminology: objects, attributes, behaviours, states, classes, instances, associations; abstraction, inheritance, generalisation/specialisation, parent (base/superclass/ancestor) and child/children (subclass/descendant) classes, encapsulation/information hiding, polymorphism, message passing, dynamic binding;

Problem solving using a procedural approach versus an object oriented approach;

Representing classes, objects, attributes: build generalisation relationships; define is-a relationships; divide into superclasses/subclasses; build associations between classes; draw an analysis-level diagram;

Methods: method definitions; static keyword; location of methods; arguments/parameters; method invocation; return types; method modifiers;

Classes and objects: defining classes, member variables and member methods; access modifiers; creating and destroying objects/instances; class and instance variables, static variables; object values including predefined object values (null, this, super);

Constructors: constructor method; overriding defaults; sending arguments; overloading methods including constructor methods; overriding a method; blocks and scope;

Exceptions: how to handle exceptions/errors; the throw clause; try, catch and finally blocks; rethrowing an exception;

Extending classes: abstract classes; nested classes and interfaces; interfaces and polymorphism; constructors in extended classes, constructor phases; single inheritance versus multiple inheritance; single inheritance of implementation; accessing and initialising superclasses; named and anonymous inner classes; member and local inner classes; iteration, exception-safety and delegation idioms based on inner classes;

Prerequisites: CS4512

CS4019 - DIGITAL ARTS 1
ECTS Credits: 6
Rationale and Purpose of the Module: This module offers a socio-economic, political and cultural exploration of the "internet society". The course will provide a series of perspectives on the network society, examining its conceptual foundations, critiquing its more polemical exponents, and subjecting the claims of the electronic sublime to critical scrutiny. This module will help students understand some of the current debates in the media about the effects of information and communications technology on society. The module will help the student to develop critical thinking around key issues of the Information Society.

Syllabus: In this module, the students will cover a series of available approaches to the study and understanding of technological innovation and social change in the Information Society. In particular, the module covers three main approaches to investigate issues related to the Information Society: technological determinism, social constructivism, and alternative theoretical approaches such as Actor Network Theory. The module will then cover a series of specific case studies regarding recent technological innovation and social change. Key issues of the Information Society (security vs. privacy; copyright vs. copy-left) will be discussed through practical examination of selected case studies in different areas (proprietary systems and IP, user generated content platform and online communities, open source movements).

CS4023 - OPERATING SYSTEMS
ECTS Credits: 6

Computer Science & Information Systems

Rationale and Purpose of the Module: On successful completion of this module a student should have a clear understanding of the
(1) Logical structure of, and facilities provided by, a modern OS
(2) Concepts of processes, threads and multitreading and how they are implemented in a modern OS
(3) Problems that arise when processes collaborate and compete and well as being able to demonstrate practical experience of mechanisms for handling this situation
(4) Different ways of implementing virtual memory
(5) Use of system calls

Syllabus: (1) Positioning the operating system (OS) between the user and the hardware; the need for the OS; different types of OSs; interfaces to an OS and the interface with the hardware;
(2) The concept of a process and a thread; representation of processes and threads; process and thread state; process creation and termination; thread creation, scheduling and termination; multitreading;
(3) Scheduling; context switching; concurrency, including interaction between threads;
(4) Inter process communication (IPC); synchronization and mutual exclusion problems; software algorithms for IPC; 2 processes, n processes;
(5) Low and high level mechanisms for IPC and synchronization: signals; spinlocks; semaphores; message passing and monitors; deadlock; use of semaphores for synchronization, mutual exclusion, resource allocation; implementation of semaphores; use of eventcounts and sequencers for classical IPC problems; conditional critical regions; monitors and condition variables;
(6) Physical and virtual memory; address translation; base and length registers; segmentation and paging; cache memory; system services for memory management;
(7) I/O subsystem, directory name space; inodes; synchronous and asynchronous I/O; locking; buffering;
(8) File systems and file management; file system types; disk organization; mounting a file system; device drivers; file system based IPC; pipes; the socket mechanism; IPC using sockets;
(9) Fault tolerance and security;

Prerequisites: CS4211

CS4025 - DIGITAL AUDIO FUNDAMENTALS
ECTS Credits: 6

Computer Science & Information Systems

Rationale and Purpose of the Module: An introduction to digital audio aimed toward preparation for studio applications.

Syllabus: Nature of analog and digital sound; Principles of digital signal processing for audio including sampling theory and spectral representation, digital sound synthesis techniques; Digital audio recording techniques including selection and use of microphones; Multitrack recording; Manipulation of digital audio files; Digital audio and compression; Digital audio distribution including storage, internet and digital audio broadcasting.

CS4028 - E-BUSINESS ARCHITECTURES
ECTS Credits: 6

Computer Science & Information Systems

Rationale and Purpose of the Module: The rationale for including this module is that students reading degrees with a substantial computing component should have an understanding of the e-business domain.

Web application validation: problems, solutions, vulnerabilities
Web Application Frameworks (WAFs): the value of WAFs; WAF functionality; WAF types; WAF categories; enabling technology; Selecting an Web Application Frameworks (WAF): overview and architecture of a WAF; criteria for evaluating WAFs; E-marketing and e-advertising concepts; e-marketing communications; e-business payment systems; e-advertising charge models; e-advertisement types; affiliate marketing, e-customer relationship management (E-CRM)
Social, legal and ethical issues in e-business;
Network Security: Security threats: malicious code, web application attacks, cyber vandalism, spoofing, denial of service attacks; Security solutions: encryption, digital signatures, digital certificates, firewalls, proxies
Wireless Technology and M-Business: location-identification technologies; wireless marketing; wireless payment options; privacy and the wireless internet;

Prerequisites: CS4135

CS4031 - INTRODUCTION TO DIGITAL MEDIA
ECTS Credits: 6

Computer Science & Information Systems

Rationale and Purpose of the Module: To introduce students to some of the seminal developments in technology and to provide them with a historical perspective on how these developments have impacted on human development.

Syllabus: The influence of technology on cognition and activity; An overview of conceptual development of computer media. The relationship of Technology to Practice, Form, Content and Remediation. Case studies will consider the influences, consequences and interrelationship of media and thought, including examples from the world of work, education, video games, social media, ubiquitous computing, personal fabrication and so forth.

CS4053 - DIGITAL VIDEO FUNDAMENTALS
ECTS Credits: 6

Computer Science & Information Systems

Rationale and Purpose of the Module: To introduce students to the principles and technologies applied to digital video representation and recording.

Audio technology for video.

CS4055 - DATA MINING AND DATA WAREHOUSING
ECTS Credits: 6

Computer Science & Information Systems

Rationale and Purpose of the Module: To introduce students to the concepts and strategies for the design, development and implementation of data warehouses and repositories in order to enable their exploitation by knowledge discovery and data mining technologies.

Syllabus: What is data mining; why data mining; cross-industry standard process (CRISP-DM); CRISP-DM in action; data warehousing and enterprise intelligence; basic elements of data warehousing; what tasks can data mining approach; Data pre-processing: data cleaning, handling missing data, identifying misclassifications. Graphical methods for identifying outliers. Data transformation, numerical methods for identifying outliers. Hypothesis testing versus exploratory data analysis: dealing with correlated variables, categorical variables, using exploratory to uncover anomalous fields, numerical variables, multivariate relationships, selecting intersecting subsets of the data for further investigation.

Data warehousing with intelligent agents: integration of database and knowledge-based systems, the role of artificial intelligence in warehousing.

Data warehouse performance: measuring data warehouse performance, performance and warehousing activities; data warehousing and OLAP, relationship between data warehousing and OLAP.

Aspects of building data warehouses: physical design, using functional independence, loading the warehouse, metadata management, operation phase, coherent management of warehouses for security.

Data mining task in discovering knowledge in data: statistical approaches to estimation and prediction, univariate methods: measures of centre and spread, statistical inference, confidence interval estimation, bivariate methods: simple linear regression, confidence interval for the mean value of y given x, prediction intervals for a randomly chosen value of y given x, multiple regression, verifying model assumptions.

Nearest neighbour algorithm, supervised versus unsupervised methods, classification task, k-nearest neighbour algorithm, distance function, combination function, quantifying attribute relevance, k-nearest neighbour algorithm for estimation and prediction.

Classification and regression trees, C4.5 algorithm, decision rules, comparison of the C5.0 and CART algorithms applied to real data.

Neural networks: neural networks for estimation and prediction, sigmoid activation function, back-propagation, gradient descent method, back-propagation rules, termination criteria, momentum term, sensitivity analysis.

Clustering task: hierarchical clustering methods, k-means clustering.

Self-organising maps, Kohonen networks, cluster validity, using cluster membership as input to downstream data mining models.

CS4057 - MACHINE LEARNING AND AI FOR GAMES
ECTS Credits: 6
CS4061 - MEDIA PROGRAMMING 1
ECTS Credits: 6

Computer Science & Information Systems

Rationale and Purpose of the Module: This module will familiarise media students with computer programming and make them aware of how it can be of benefit to them in their careers. Students will learn how to write their own programs to manipulate images.

Syllabus:
- Introduction to classes and objects;
- Primitive data types; declaring and defining variables/data; constant definitions; mixed data types; assignment statements; input and output;
- Arithmetic operators; casting; relational operators; logical operators; precedence rules;
- Working with turtle objects to create and display picture objects and to create and play sound objects; sending messages to objects; creating methods; method arguments and parameters;
- Introduction to how images are digitized/encoded; different models for colour and colour representations;
- Looping constructs; modifying images using loops to undertake lightening and darkening, creating a negative, increasing and decreasing colour values, converting to greyscale;
- Using nested looping constructs for processing elements of arrays to mirror images, to compose images, to blend greyscale;
- Introduction to selection statements; using conditional constructs to replace one colour or a range of colours, to average nearby pixels and to replace the background of an image;

CS4063 - DIGITAL MEDIA SOFTWARE AND SYSTEMS 2
ECTS Credits: 6

Computer Science & Information Systems

Rationale and Purpose of the Module: To develop knowledge and competence of digital media systems.

Syllabus: To develop knowledge and competence of digital media systems:
1. A survey of sound synthesis techniques from early electronic music to contemporary software
2. Creation of synthesis techniques in industry-standard software
3. Examination of additive synthesis, modulation synthesis and contemporary techniques
4. Basics of frequency-domain processing
5. Real-time computer methods for sound design and processing
6. Aesthetics and development of sound design and processing

CS4067 - WRITING GAMES ANALYSIS
ECTS Credits: 6

Computer Science & Information Systems

Rationale and Purpose of the Module: The primary objective of this module is to define the art and practice of writing computer games. Students discover how to analyse Games Discourse and are introduced to Wittgensteinian definitions of language-games as a tool for understanding and critiquing formal descriptions of language, thought and the process of story creation and revelation. Students are given a heuristic for investigation that results in their discovery of a complicated network of similarities, overlapping and criss-crossings within the structure of an essentially hypertextualised story. The final objective is that students learn how a game may resemble a simulation that tries to model a phenomenon by isolating the essential features of that phenomenon and plays them out in a way that does not affect the phenomenon and ultimately the students are required to produce their own written phenomenon.

Syllabus:
- history and development of games' story development;
- character development;
- discourse analysis;
- hypertextual narratology;
- gaming as hermeneutical play;
- game-states and rule definitions;
- iteration, repetition and rapture;
- Derrida's "Structure, Sign and Play";
- game criticism, speculation and theory;
- rules and metarules; winning conditions;

Prerequisites: CS4006
Computer Science & Information Systems

**CS4075 - COMPUTER GAMES PROGRAMMING - TOOLS AND TECHNIQUES**  
ECTS Credits: 6

**Rationale and Purpose of the Module:** The aim of this course is to increase student's competence in the area of computer games development with the focus on programming activities. It will introduce all the elements constituting computer games and familiarize the student with existing libraries providing required functionality.

**Syllabus:** Introduction to programming interactive computer games. This module provides an introduction to computer game application elements. Areas covered include:

- Components of Game
- Resource Management Techniques
- AI and Interaction Techniques
- Networking for Games
- Physics Simulation
- Collision Detection
- Use of Scripting Engines

It introduces required tools and libraries facilitating the job of computer games programmer. After finishing this module student will gain competence in programming basic, but complete, computer game applications.

**Prerequisites:** CS4815

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**CS4076 - EVENT DRIVEN PROGRAMMING**  
ECTS Credits: 6

**Computer Science & Information Systems**

**Rationale and Purpose of the Module:** This module will provide students with a comprehensive introduction to event driven programming where a strong emphasis will be placed on practical application in at least two high level development environments. In addition, students will be introduced to multiprocessor support for event driven programs and shown how to improve event processing performance through parallel event transformation.

**Syllabus:** Imperative versus event driven paradigms. Introduction to GUI creation; graphical structures: frames, boxes, layout managers, menus, windows. Event handling process, event handling mechanisms: event classes, event sources, event listeners. The Delegation Model of event handling. Avoiding deadlocks in GUI code. Limits of message passing libraries and thread libraries. Event processing performance. Introduction to multiprocessor support for event driven programs. Techniques to improve event processing performance through parallel event transformation.

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**CS4083 - SOUND SYNTHESIS**  
ECTS Credits: 6

**Computer Science & Information Systems**

**Rationale and Purpose of the Module:** To develop knowledge and competence of digital media systems. (Existing module CS4063 "Digital Media Software & Systems 2" is part of a suite of modules core to both LM113 (Digital Media Design) and LM114 (Music, Media & Performance Technology). The course board has decided that the titles of this suite of DMSS modules do not adequately describe the course content and therefore wish to change the titles to better communicate the content. The content itself of these modules remains the same - only the title itself is changed.)

**Syllabus:** To develop knowledge and competence of digital media systems:
1. A survey of sound synthesis techniques from early electronic music to contemporary signal processing
2. Creation of synthesis techniques in industry-standard software
3. Examination of additive synthesis, modulation synthesis and contemporary techniques
4. Basics of frequency-domain processing
5. Real-time computer methods for sound design and processing
6. Aesthetics and development of sound design and processing

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**CS4101 - INTRODUCTION TO MODEL-DRIVEN DEVELOPMENT**  
ECTS Credits: 6

**Computer Science & Information Systems**

**Rationale and Purpose of the Module:** This module aims to introduce students to the field of model-driven software development, that is, to techniques that simplify development by allowing applications to be created by constructing models (like e.g. UML Activity Diagrams, Process Models, or Simulink state transition diagrams) rather than by direct coding in conventional programming languages (like e.g. Java, C++, or Python). Its objectives are to give students an appreciation of the use and impact of models in software design, development, analysis, testing quality assurance, compliance, and maintenance. The module furthermore introduces them to tools that support (parts of) the model-driven development process.

**Syllabus:** Software development is much more than coding. Analysis of the software development process and which activities are involved.

What is a model? model criteria: mapping criterion, reduction criterion, pragmatic criterion; models versus real systems; abstraction and similarity; iconic, analog
Rationale and Purpose of the Module:
The role of models in software development; use of descriptive and prescriptive models; risks associated with model usage; formal approach to building models; problem conceptualization; collection and examination of data; model structure, content and layout; development and use of macros; model validation and documentation; developing model templates.

Concrete examples of software models and tools used in model-driven development. Executable models: interpretation and code generation. Design-time validation and verification.

CS4107 - PERFORMANCE TECHNOLOGY 2
ECTS Credits: 6

Computer Science & Information Systems

Rationale and Purpose of the Module: Students will develop their knowledge of performance technology in the context of interactive environments for digital media through a combination of laboratory based small group project work and lecture based learning.

Syllabus: This module will focus on the use of electronic sensors and actuators in combination with software and PC based approaches in the development of performance systems and interactive environments.

Key topics will include:
The software and hardware development of a performance system.
Implementing performance systems for multimedia (movement triggering, dance, installation, virtual spaces, enhanced environments).
Implementing performance software for composition (composition with instruments and electronics, dynamic reactive audio and video playback).

CS4123 - INFORMATION MODELLING AND SPECIFICATION
ECTS Credits: 6

Computer Science & Information Systems

Rationale and Purpose of the Module: This module serves to introduce the concepts that will be developed later on in the Systems Analysis and Design and Database Systems modules. Focusing on Data modelling, relational database languages and a formal specification notation, in particular using typed sets, n-ary relations and predicate logic, students are introduced to an integrative systematic approach linking system specification and implementation.

Syllabus:
System development life cycle models. Specification and implementation; verification and validation.
Modelling facts in terms of Predicates, Sets, Relations.
The Relational Model of Data. Relations and Tuples. Relational Algebra: the 8 operators; Select, Project, Product, Join, Union, Intersection, Difference and Division. Relational calculus. Tuple variables.
SQL, simple queries, conditions and expressions.
Join queries and sub-queries.
Query nesting, Union and views in SQL.
Data analysis: attributes and values.

CS4115 - DATA STRUCTURES AND ALGORITHMS
ECTS Credits: 6

Computer Science & Information Systems

Rationale and Purpose of the Module: To provide a uniform theoretical treatment of the data structures and algorithms used in systems and applications programming. This module includes a practical component to reinforce learning and to encourage students in the practical use of theoretical material.

Syllabus:
- Mathematics Review;
- Review of the ADTs, internals and usage of simple data structures and associated algorithms, in particular recursive algorithms;
- Linked Lists and Networks;
- Recursion, and the elimination of recursion from algorithms;
- Study of sorting algorithms: quicksort, heapsort, mergesort and bucket and radix sorting;
- Analysis of general divide-and-conquer algorithms;
- Searching: tree searching, AVL trees, splay trees;
- Graph algorithms: graph traversal and spanning forests, depth and breadth first search of graphs; connectivity; minimal spanning trees for weighted graphs; shortest path algorithms; networks.

CS4125 - SYSTEMS ANALYSIS AND DESIGN
ECTS Credits: 6

Computer Science & Information Systems

Rationale and Purpose of the Module: The development of large-scale complex software-based systems proceeds from analysis through design and implementation to system verification and validation. This module covers the analysis and design phases of the software development cycle with particular emphasis on the use of Object-oriented approaches to specification.

Syllabus:
- Software lifecycles: review of the waterfall model, prototyping, spiral, and object-oriented (OO) development models.
- Focus on the Unified Software Development Process (USDP).
- Characteristics of good software design - modules, cohesion, coupling or dependency, encapsulation, abstraction, etc.
- Requirements investigation.
- Requirements classification: functional and non-functional requirements.
- Requirements modelling: use case diagrams and use case descriptions.
- Computer aided software engineering (CASE).
- Review of OO concepts: classes and objects, abstract classes, class interfaces, inheritance, polymorphism, etc.
- Analysis using OO method and UML: identification of classes using key domain abstraction, CRC cards, collaboration and sequence diagrams, state transition diagrams, and activity diagrams.
- Overview of object-oriented software architectures: layering and partitioning, open versus closed, MVC, broker, etc.
- Design using OO method and UML: concurrency, object design, collection classes, GUI design, and data management design.
- Additional diagramming notation: packages,
subsystems, and implementation.
- Analysis and design patterns.
- Frameworks.
- Other methodologies - DSDM, Agile approaches, Extreme Programming.

CS4141 - INTRODUCTION TO PROGRAMMING
ECTS Credits: 6

Computer Science & Information Systems

Rationale and Purpose of the Module: To provide a language independent introduction to programming using one programming language - the programming language and its operating environment is selected by the Department and the selection is reviewed regularly.

Syllabus: a. Programming process: understanding the problem, planning the logic, designing the solution, code the program, translate the program into machine language, test the program; syntax and semantics.
b. Declaring and defining variables/data; primitive data types; constant definitions; mixed data types; arithmetic expressions and precedence; assigning statements.
c. Relational expressions, logical expressions and precedence; selection statements; problem solution considerations; data validation; error handling.
d. Looping constructs; problem solution considerations.
e. Introduction to classes, objects and encapsulation.
f. Modules, subroutines, procedures and functions; flow of control; design considerations; library functions; user defined functions; local and global variables; scope, visibility and lifetime of variables/data; actual and formal arguments/parameters.
g. Desk checking solutions; dry running code; writing self-checking code; systematic debugging approaches.
h. One dimensional arrays and their manipulation.
i. String manipulation
j. Input and Output.

CS4158 - PROGRAMMING LANGUAGE TECHNOLOGY
ECTS Credits: 6

Computer Science & Information Systems

Rationale and Purpose of the Module: To provide students with an understanding of production systems, phrase structure generative grammars, the languages generated by these grammars, and the abstract state machines that elucidate the parsing process. To provide students with an understanding of how recognition/parsing programs can be systematically derived from grammars, especially by means of parser generators. To provide an understanding of the notion of syntax directed translation, and how it can be implemented in parser-based tools, especially applied to code-generation, and documentation of programs.

Syllabus: - Notion of Phrase Structure;
- Notion of Post's Production Systems;
- Chomsky's definition of Phrase structure Generative Grammars, and Hierarchy of Grammars. Sentential Forms and Languages generated by Context Free Grammars;
- Regular expressions, Regular sets, and Regular Grammars;
- Classification of Abstract State Machines, Configurations, Transitions;
- Construction of Recognising Finite State machines from Regular Grammars and Coversely Program Design based on Regular Expressions;
- Construction of Lexical Analysers including use of Generators such as LEX/FLEX;
- Leftmost and Rightmost derivation of sentences from Context Free Grammars, Parse trees, and ambiguity of Grammars;
- Top Down Parsing (Recursive Descent) Techniques;
- Bottom Up (LR) Parsing Techniques;
- Notion of an Item, Closure of a set of Items, Transitions between sets of items, and canonical collections of valid items;
- Parser Generators such as YACC/BISON and their use in syntax directed translation.

Prerequisites: CS4111, CS4112, CS4411, CS4512, CS4013

CS4187 - PROFESSIONAL ISSUES IN COMPUTING
ECTS Credits: 6

Computer Science & Information Systems

Rationale and Purpose of the Module: Information and Communication Technology (ICT) industries employ large numbers of people who create technologies affecting a wide range of different types of communities within society as a whole. It is very important that students who will be entering these industries do so with an understanding of ethical professional and cultural issues that they will need to engage with as professionals. To this end Professional Issues in Computing focuses on the ethical, legal and social consequences of the design, implementation and use of computer and information systems.

Syllabus: What is a computer professional?
Ethical theories including: consequentialism and non-consequentialism; utilitarianism; deontological theory.
Ethical decision making frameworks.
Applying ethical theories to moral problems in ICT.
Codes of conduct of professional bodies in ICT.
Legal implications of being a professional including: Intellectual property law; privacy and data protection; computer crime; Irish, European and American laws and potential for conflict.
Conflict between the legal and the ethical approaches.
Social impacts of ICT including: Digital divide - exclusion based on: race, gender, age, language; North/South divide, power and democracy, unstoppable progress, physical and social disability.

CS4227 - SOFTWARE DESIGN AND ARCHITECTURE
ECTS Credits: 6

Computer Science & Information Systems

Rationale and Purpose of the Module: The objectives of this module are to equip students with the fundamental knowledge and techniques necessary to design quality software at the object and component level. The emphasis is on the support of architectural use cases through patterns at the architectural and design level, refactoring and Component Based Development (CBD) at both theoretical and applied level.

Syllabus: Topics presented include:
- Challenges facing the Object Oriented (OO) and Component Based Development (CBD) paradigms. Characteristics of good software focusing on modular decomposition, coupling, cohesion, interfaces, encapsulation and architecture centric component based development.
- Modelling of architectural use cases.
- Object Oriented Design (OOD) with a focus on extensibility and performance using a generic OO method in conjunction with the Unified Modelling Language (UML).
- Design of software architecture focusing on architectural patterns such as those presented in the volumes on Pattern Oriented Software Architecture series.
Detailed design focusing on creational, structural and behavioural design patterns.
Introduction to refactoring, code smells and refactoring to patterns.
Component Based Development in theory and practice.
Overview of topics such as Service Oriented Architecture, Domain Specific Languages etc.
Comparison of OO versus CBD.

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**CS4911 - INTRODUCTION TO INFORMATION TECHNOLOGY**
**ECTS Credits: 6**

**Computer Science & Information Systems**

**Rationale and Purpose of the Module:** This module is designed to give 1st and 2nd year students from disciplines other than Computing a historical and theoretical introduction to information technology: concepts, terminology and possible future developments; together with practice in standard productivity software.

**Syllabus:** This module is designed to give 1st and 2nd year students from disciplines other than Computing a historical and theoretical introduction to information technology: concepts, terminology and possible future developments; together with practice in standard productivity software.

- Concepts of information technology.
- Data and information.
- Software: general purpose applications, operating systems features, programming development languages, HTML; proprietary software and Open Source Software.
- Hardware: types of computers, input/output devices, CPU, memory and secondary storage disks and solid state memory.
- Development of the PC.
- Communications and connectivity: modems, communications channels, networks: LAN, WAN.
- The Internet and the Web: access, browsers, URLs, search engines, multi-media.
- Security issues: virus, firewall, proxy server.
- Computers and society: dependence of society on computers, development of WP, e-commerce, the WWW impact on the media and advertising.
- Future hardware and software developments.
- Word Processing and spreadsheet practice.
- Data representation.
- HTML exercises.

**CU4037 - EUROPEAN CINEMA FROM ITS BEGINNINGS TO THE 1950s**
**ECTS Credits: 6**

**School of Modern Languages and Applied Linguistics**

**Rationale and Purpose of the Module:** The module intends to give students an overview over the major developments in the various European national cinema traditions up to the end of the 1950s. It aims to introduce students to basic concepts of film historiography as well as key issues of the periods studied such as the role of film within popular culture, aesthetical debates and theories before and after the introduction of sound films, the mutual influences of American and European cinema. The main focus of this module will be on the development of Soviet, French, German, Spanish, Italian and Scandinavian Cinema.

**Syllabus:** Principles of film history; Europe vs. America; the concept of National Cinema; aesthetics of silent vs. sound films; literature vs. moving images; visions of modernity; images of technology and science fiction. Aspects covered will include: Beginnings (Lumière brothers, Georges Meliès); Nordisk Film Companie; Film and World War I; Soviet Cinema (Montage, Eisenstein, an understanding of; 
* the ways in which visual texts have emerged as a dominant mode of cultural communication
* how visuality has emerged as a primary concern within a range of disciplinary formations such as cultural studies, film studies, media studies, sociology and technology.

**CU4027 - VISUAL CULTURAL STUDIES**
**ECTS Credits: 6**

**School of Modern Languages and Applied Linguistics**

**Rationale and Purpose of the Module:** The aim of this module is to provide students with a comprehensive overview of the transdisciplinary formations of visual culture and visual cultural studies. Students will develop an understanding of; 
* the ways in which visual texts have emerged as a dominant mode of cultural communication
* how visuality has emerged as a primary concern within a range of disciplinary formations such as cultural studies, film studies, media studies, sociology and technology.
Dziga Vertov); Weimar Cinema (Expressionism, Fritz Lang, Murnau, mountain films, proletarian cinema, Marlene Dietrich); French cinema (Gance, Renoir); Nazi Cinema (cinema as propaganda; Riefenstahl); Italian Neo-Realism (Rossellini, de Sica), Spanish Cinema (Berlanga, Bunuel).

**CU4121 - INTRODUCTION TO NEW MEDIA AND CULTURAL STUDIES**  
ECTS Credits: 6  
School of Modern Languages and Applied Linguistics

**Rationale and Purpose of the Module:**  
* To introduce students to the fields of cultural studies and new media and to the basic concepts underlying their study of these disciplines over the course of their programme.  
* To give students the theoretical tools to analyse cultural processes and to investigate new media as cultural institutions, particularly in comparative contexts.  
* To raise students’ intercultural awareness as part of a process of preparing for the Erasmus/study abroad semester.  
* To introduce students to the concept of career planning, particularly with the objective of preparing them for cooperative education as an integral part of their course.

**Syllabus:**  
* The notion of culture: defining and describing the notion of culture and cultures; comparing different definitions and traditions of culture in a range of contexts; cultural anthropology; linguistic dimensions of culture; cultural policy and cultural imperialism; language and cultural awareness.  
* Media and culture: identifying and describing cultural dimensions of media processes; the cultural specificity of media in different linguistic and cultural contexts; cultural dimensions of new media processes.  
* Analysing cultural processes: theories and methodologies of cultural analysis.  
* Career planning for students: skills awareness; career awareness; preparation for the off-campus year.

**CU4127 - CULTURAL STUDIES 5: COMPARATIVE LITERATURE**  
ECTS Credits: 6  
School of Modern Languages and Applied Linguistics

**Rationale and Purpose of the Module:**  
* To introduce students to theoretical approaches to comparative literature and apply these to literary texts concerned with specific themes and genres in a variety of cultural contexts. In particular, the module will explore the ways in which such literary texts enable critical inquiry into common experiences past and present across cultures. The module will also provide the setting for further developing the students’ critical and analytical skills in the study of literature.

**Syllabus:**  
The course is structured as follows:  
The students will be introduced to the concept of comparative literature, the development of specific genres and themes and, following on from this, to a range of examples from different cultural and language backgrounds. The students will also focus on the analysis of the prime texts from a comparative approach, looking at various textual strategies of representation.

**DA5001 - ETHNOCHOREOLOGY: HISTORY AND THEORY**  
ECTS Credits: 12

**Humanities**

**Rationale and Purpose of the Module:**  
The primary objective of this module is to inform students of historical and theoretical perspectives of Ethnochoreology, an interdisciplinary subject which considers dance in its cultural context. This means examining the relevant literature in Anthropology, Sociology, Cultural Studies, Linguistics, Gender Studies and Education in addition to other relevant areas of Dance Studies, to highlight the main theoretical developments in the discipline.

**Syllabus:**  
The history and development of ethnochoreological and dance anthropological theory; applications of anthropological perspectives in the discipline including: functionalist, symbolic, structuralist, linguistic, cognitive, practice and interpretive.

**DA5101 - REPERTOIRE AND STYLE IN IRISH TRAD DANCE PERFORMANCE 1**  
ECTS Credits: 12

**Humanities**

**Rationale and Purpose of the Module:**  
The objective of this module is to introduce students to the repertoires of diverse Irish traditional dance performance practices within a variety of theoretical, methodological and dance performance contexts. Students learn and embody the repertoires and their respective aesthetics from master tutors. This develops the performance skills of students.
and enhances their critical awareness and understanding of different performance practices and their respective aesthetic systems within the Irish dance tradition. Students will also learn research methods which they will apply to a dance ethnographic project of their choice.

**Syllabus:** Students will develop their knowledge of traditional dance repertories and styles through practical, studio-based, dance workshops, performances and lectures; the history and development of different dance performance practices; contexts for the performance of traditional dance practices; aesthetic systems and related kinetic vocabularies; and research methods in dance including Labanotation, will inform their analytical perspectives of dance. The combination of theory and practice within the syllabus is designed for deeper understanding.

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**DA5111 - DANCE PRACTICUM 1**

**ECTS Credits:** 12

**Humanities**

**Rationale and Purpose of the Module:** The objective of this module is to provide students with appropriate knowledge and skills to create new work from an Irish traditional dance perspective. The module includes both a theoretical and practical dimension. Literature related to choreographic principles and dance are examined along with practical explorations of both Irish dance practices and modern dance techniques and forms. Students learn from, and collaborate with, choreographers in the creation of new work. This theoretical and practical approach provides a foundation from which students can extend their knowledge and abilities to choreograph new work.

**Syllabus:** The syllabus is structured to extend the students’ knowledge, skill and dance experience: practical dance technique and body awareness classes; theoretical and practical classes on the act of choreography and choreographic principles; analysis and critical evaluation of specific choreographed works (live performances and audio-visual material).

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**DA6021 - DANCE ETHNOGRAPHY**

**ECTS Credits:** 6

**Humanities**

**Rationale and Purpose of the Module:** The rationale for this module is to train students in appropriate methods and techniques in dance ethnography and to critically engage them in ethno/graphic documentation, representation and reflexive writing.

**Syllabus:** The objective of this module is to critically engage students in discourses surrounding ethnographic research methodologies in the field of ethnochoreology. These include issues relating to ethnography and ethnographic inquiry; cultural representation; documentation skills; and reflexive writing. Using appropriate ethnographic tools, students will produce a context-rich portfolio based on a firsthand experience in the field and subsequent critical reflection on the process.

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**DA6031 - CONTEMPORARY DANCE TECHNIQUES**

**ECTS Credits:** 12

**Humanities**

**Rationale and Purpose of the Module:** The aim of this module is to introduce conceptual frames and theoretical perspectives that support the creation and performance of contemporary dance choreographies and to support students to undertake research into performance-making, with a focus on creating work which is thought provoking and imaginative rather than safe and conventional. Throughout the module each student will investigate a range of approaches towards creating and performing original performing set choreographies and improvisational scores.

**Syllabus:** The knowledge is structured according to the principles and practices underpinning history and tradition of Western Contemporary and Post-Modern dance techniques and performance. Its transmission is through live, text, video, DVD and studio-based, methods and modes of inquiry based on aesthetic, historical, cultural theories and concepts that have informed the development Western Contemporary and Post-Modern choreography and performance to date.

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**DA6041 - EMBODYING IRISH DANCE PRACTICES 1**

**ECTS Credits:** 6

**Humanities**

**Rationale and Purpose of the Module:** The rationale for this module is to critically engage students in discourses surrounding ethnographic research methodologies in the field of ethnochoreology. These include issues relating to ethnography and ethnographic inquiry; cultural representation; documentation skills; and reflexive writing. Using appropriate ethnographic tools, students will produce a context-rich portfolio based on a firsthand experience in the field and subsequent critical reflection on the process.

**Syllabus:** The objective of this module is to critically engage students in discourses surrounding ethnographic research methodologies in the field of ethnochoreology. These include issues relating to ethnography and ethnographic inquiry; cultural representation; documentation skills; and reflexive writing. Using appropriate ethnographic tools, students will produce a context-rich portfolio based on a firsthand experience in the field and subsequent critical reflection on the process.

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**DA5141 - PRACTICUM 1 - DANCE PERFORMANCE REPertoire**

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practice through practical studio-based dance workshops, performances and lectures; the history and development of different dance performance practices; aesthetic systems and related kinetic vocabularies; and dance notation skills, will inform their analytical perspectives of dance. Theory and practice are combined to deepen their engagement with Irish dance.

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**DM4003 - OPERATIONS MODELLING (ENG)**  
**ECTS Credits:** 6

**School of Engineering**

**Rationale and Purpose of the Module:** Understand the role of operations in both production and service enterprises. Introduce Lean thinking and structured operations improvement tools. Introduce a range of quantitative methods and highlight their application in the decision making process for solving real world problems. Provide an understanding of optimal decisions under constraints. Provide an understanding of design and analysis of operations under uncertainty. To provide students with modeling and software capabilities that can be applied to operations design and analysis.

**Syllabus:** Lean Thinking and Operations  
Introduce students to lean thinking and operations improvement tools used within DMAIC (Define-Measure-Analyze-Improve-Control) projects. Related lean thinking to operations modeling methods.

Operations Modeling - Software: Introduce and provide students with base skills to use software to solve operations optimization models. The focus is primary on introducing the student to spread sheet modeling, but brief introductions to other modeling and optimization software will be given. Students will apply software modeling skills obtained here to subsequent topics.

Operations Modeling Under Constraints  
Basic definition of Linear programming, demonstrate method via graphical method, model formulation applications in operations. Simplex method, Artificial starting solution method, interpretation of simplex tableau, sensitivity analysis.

Transport model, Assignment model, Shortest Route model, Network Minimisation model, Maximum Flow Model, Transshipment model. Introduce binary and integer applications in operations analysis, integer solution methods such as branch-and-bound and meta heuristics solution methods.

Decision Making Under Uncertainty  
Introduce decision making under uncertainty. Introduce basics of simulation using spreadsheets. Introduce basic queuing and inventory models.

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**DM4007 - DESIGN PROJECT 1**  
**ECTS Credits:** 6

**School of Engineering**

**Rationale and Purpose of the Module:** To enable the student to combine previously learned course material with their individual talents in order to solve real-life engineering projects. To develop in the students the ability to organise and direct their own work and to present this work in written and verbal format in a proper manner. To develop the students research ability.

**Syllabus:** The student is required to complete a project the selection of which is made from a list provided by academic staff members. In some cases the project may be an extension of the work of the student from the Cooperative Education scheme. Projects are selected by the student in the latter part of the Spring Semester in the third year.

During the summer period of the third year the student is encouraged to explore the topic selected and to carry out a literature survey on same. During the Autumn and early part of the Spring Semesters the student meets with the project supervisor at regular intervals where any problems which may arise are dealt with and plans are made for further work. At these meetings the student is always encouraged to show initiative and imagination in developing the project.

Normally students undergo an interim assessment during week ten of the Autumn Semester, this is based on a verbal presentation of the work carried out to date. The final assessment is based on the quality of the presented Project Report and any other relevant associated work.

The Grade for the Project is set after an interview of the student by the supervisor together with at least one other member of the academic staff.

The Project Report is typed on good quality A4 paper using a 12 point font and one-and-one-half line spacing. All drawings are to BS 308 standard and other figures, photos and tables are to be properly annotated and neat in their presentation. The covers should be of soft card with suitable plastic binding.

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**DM4017 - SIMULATION MODELLING AND ANALYSIS**  
**ECTS Credits:** 6

**School of Engineering**

**Rationale and Purpose of the Module:** To provide students with knowledge on discrete event simulation modeling and its application to manufacturing, logistic and services systems. To provide students with modelling and software capabilities to apply simulation to manufacturing, logistic and services systems.

**Syllabus:** Introduction to simulation  
Overview of simulation modelling, introduction to the basic concepts of discrete event simulation. The simulation process steps involved in carrying out a simulation project. Comparison of discrete event simulation with continuous simulation and system dynamics.

Computer simulation packages  
Overview of available computer packages, description of representative packages, computer implementation issues. Development of programming skills to apply simulation to manufacturing, logistic and services systems using a generic simulation package. Provide an overview of available simulation software.

Statistical aspects of simulation  
Input analysis, random number generation, output analysis, experimental design.

Queuing Models  
Provide comparison of simulation with stochastic mathematical models through the introduction of basic queuing models.
Systems Design
Using simulation students will carry out systems (manufacturing, logistic and services systems) design assignments.

DM4027 - MEASUREMENT AND QUALITY SYSTEMS
ECTS Credits: 6
School of Engineering

Rationale and Purpose of the Module: Appreciate the importance of measurement standards and systems. Apply sound principles to a variety of measurement requirements. Understand and apply scientific principles to the analysis of manufacturing data. Use the results of the analysis to identify areas that need improvement.


Rationale and Purpose of the Module: This module builds on the introductory microeconomics module. It extends the analysis of producer and cost theory. It also extends the analysis of market structures (focusing on imperfect market structures) and introduces the issue of pricing and allocation of the factors of production. The latter part of the module looks at the economics of information and how choices are made under conditions of uncertainty. Finally, the student is introduced to the notion of general equilibrium and welfare. Using this framework, market failure and the rationale for government intervention (public sector) are examined.

Syllabus: 1) Theory of Production and Costs; 2) Models of Imperfect Competition and Game Theory; 3) Factor Markets; 4) The Economics of Information and Choice under Uncertainty; 5) General Equilibrium and Welfare
Prerequisites: EC4101

EC4027 - THE EUROPEAN ECONOMY
ECTS Credits: 6
Economics

Rationale and Purpose of the Module: The years since 1945 have been the longest period since 113 B.C. in which no army has crossed the Rhine with war-like intentions. The very idea of war between the European Union’s member States seems as remote as to be nonsensical. The creation of the European Union (EU); a legal, political, economic, cultural, and soon to be military entity, is one of the greatest economic experiments in the history of Mankind. The shape and scope of the EU has the capacity to affect the lives of hundreds of millions of people in different ways, some positive, some negative. Thus a careful study of this experiment is in order.

This module uses economics to understand the history of the EU, its significance in terms of the post 1945 World Economy, the EU’s international interactions with the rest of the world, its development up to today, and the prospects for change most likely in the future. This module builds on introductory micro and macro economic principles and using economic theory as a lens we will use real world examples, data, and current topics to inform our discussions on the evolution of the European Union.

Syllabus: The module is divided into eight sections set out below. Worksheets corresponding to each topic will aid students revise the module content. Core texts will support lecture material along with references and
Economics

Rationale and Purpose of the Module: The aim of this course is to analyse the theory and practice of economic integration and its impact on EU countries in a comparative framework (Asia). The rationale for economic integration, forms of economic integration, monetary integration are among the subjects that are discussed throughout the course.

Syllabus: Topic 1 Introduction - Definitions and economic rationale
- Integration (economic ---)
- Vehicles of EI (trade, investment - financial investment, others)
- Stages of Economic Integration: from the Customs Union to EMU
- Economic motives for EI
  - History of the 'European idea'
- Rationale for a 'historical' approach to EI
  - The "United States of Europe" (an old idea)
  - 'Triggers' of Integration in Europe

Topic 2 Milestones in the process of (Economic) Integration in Europe
- Four broad milestones
- Political stage (Robert Schuman Declaration, May 1950)
- Economic stage (ToR to 1970s)
- Monetary/financial stage (from 1979)
- Political stage ... (from 1997), GFC
- Treaties (Euratom, ECSC, Rome... Lisbon)
- Ensuing policies
- Objectives of early treaties

Topic 3 Institutions, economic policy making in the EU and budget
- 'Deep' versus 'shallow' integration (examples)
- EU Institutions
- Laws and Legislative process in the EU
- The EU budget

Topic 4 Theory of economic integration (1)
- Free trade versus autarky
- Tariff (economic impact of --)
- Two-country model (Customs Union theory)
- Trade creation and trade diversion effects
- Gains arising from integration in practice
- The 1992 programme (completion of the SEM)
the G20 (and IFIs)

Topic 10 EU macroeconomic policies

- Common Agricultural Policy
- EU competition policy
- EU trade policy

Topic 11 The EU in the global economy

- Emerging Countries and Less Developed Countries (LDCs)
- The EU Global strategy
- EU-Asia economic relations
- EU Economic Integration in a comparative perspective

Topic 12 Conclusions, revisions, exam preparation

Prerequisites: EC4101, EC4004, EC4102

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EC4045 - ECONOMICS OF NATURAL RESOURCES
ECTS Credits: 6

Economics

Rationale and Purpose of the Module: The nature, scope and key concepts of natural resource economics is followed by a discussion on the connection between markets, efficiency and sustainability including the concepts of willingness to pay and demand as well as cost and supply. The next topic examines the optimal level of pollution which is then followed by an analysis of public policy instruments in the face of market failure. A practical application here is that of EU carbon emissions trading as well as carbon taxes levies by some countries. This is followed by an investigation of the main theoretical and practical issues relating to exhaustible resources (e.g. energy). Issues relating to the extraction of coal, oil and gas are assessed. In addition, theories on the harvesting of renewable resources with specific application to forestry and fisheries are developed. The latter part of the module focuses on regional and global air pollutants. Finally, we discuss the connection between natural resources and economic growth with specific reference to both developing and developed countries.

Syllabus: The module is divided into two broad sections. The first section of the module deals with the theoretical underpinnings of environmental and natural resource economics. The second part of the module focuses on applying economic theory to the extraction of natural resources while also considers the connection between natural resources and economic growth in developed and developing countries.

Section 1: Economic Theory and Public Policy Instruments

- Topic 1 Environment Issues and Concepts
- Topic 2 Applying Techniques of Economics to Environmental Issues
- Topic 3 A General Model of Pollution Control
- Topic 4 Public Policy Instruments: Decentralised Policies
- Topic 5 Public Policy Instruments: Command and Control strategies
- Topic 6 Public Policy Instruments: Emission Taxes
- Topic 7 Public policy Instrument: Transferable Discharge Permits

Section 2: Extraction of Natural Resources and Development

- Topic 8 Depletable Resources: Peak Oil
- Topic 9 Common Pool Resources: Fisheries
- Topic 10 Renewable Resources: Forestry
- Topic 11 Global Air Pollutants: Climate Change
- Topic 12 Natural Resources and Economic Development

Prerequisites: EC4111, EC4102, EC4101, EC4112

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EC4111 - MICROECONOMICS (NON BUSINESS)
ECTS Credits: 6

Economics

Rationale and Purpose of the Module: The primary aim of this module is to introduce students to the fundamentals of modern market-oriented microeconomic analysis. The economic way of thinking introduced in this module involves the use of key concepts and models to help students to begin to understand how a complex real world micro-economy operates. The module aims to train students to think in terms of alternatives, to understand the cost of individual and firms choices and provide general frameworks to understand key microeconomic concepts and issues.

Syllabus: The question of what is economics is explored. In answering this question emphasis is placed on the importance of key concepts such as scarcity, individual decision-making, trade-offs and opportunity cost. Students are also introduced to the distinctions between microeconomics vs macroeconomics and normative vs positive economics.

Markets as a means of organising economic activity are examined. The model of supply and demand is used to understand how market equilibrium prices and quantities are determined. Intervention in the market via price ceilings and price floors are also examined. The sensitivity of demand and supply to changes in key variables such as price and income is analysed through elasticity. Consumer choice using indifference curve analysis is presented. The latter part of the module focuses its attention on supply and costs of production. The different types of costs and how costs affect revenue and profits are examined. A perfectly competitive firms supply decision along with that of Monopoly (single priced vs price discrimination monopolists) are also studied.
consumers and suppliers to make decisions about the use of society's scarce resources. Supply and demand curves are used to explain the movements of prices and the allocation of resources in a market economy such as ours. Government intervention in the market via the introduction of price ceilings (maximum price) and price floors (minimum price) are also examined. The sensitivity of demand and supply to changes in key variables such as price and income is analysed through measures of elasticity.

Individual decisions are looked at in detail to show how they come together to form the demand curve. Consumer choice using indifference curve analysis is introduced.

Shifting the focus back to the market process the latter part of the module focuses its attention on supply and costs of production. Students examine the different types of costs and how costs affect revenue and profits. Cost concepts and how they relate to a perfectly competitive firm's supply decision are examined. At the other end of the competitive spectrum is the complete absence of market competition. This situation of monopoly (single priced vs price discrimination monopolists) is also studied in detail.

The subject content of this module develops some of the analysis on how their statistical properties can be rigorously estimated and how the techniques can be applied in practice rather than on how their statistical properties can be rigorously derived. The essential purpose of the module is to meet the main empirical research needs of students who typically do not intend to specialise in econometric theory. However, the module also serves as a preparation for students who do wish to proceed to more advanced econometrics courses. Students are expected to have gained experience and show competence in the following transferable skills: data generation, IT (using statistical and econometric software), results interpretation and technical write-up, team-working, directed Web based searches, and use of library resources.

**Syllabus:** Introduction; regression analysis; method of Ordinary Least Squares (OLS); the Classical Linear Regression Model; properties of OLS estimators - Gauss-Markov theorem; interval estimation and hypothesis testing; multiple regression analysis; heteroscedasticity; autocorrelation; multicollinearity; dynamic econometric models - autoregressive and distributed-lag models; time series econometrics (including stationarity, unit roots and cointegration).

The course makes use of Excel, Microfit 4.1 and Stata data analysis and statistical software.

**Prerequisites:** EC4101, EC4111, EC4102, EC4112

**EC4333 - ECONOMICS OF EUROPEAN INTEGRATION**

**ECTS Credits: 6**

**Economics**

**Rationale and Purpose of the Module:** The years since 1945 have been the longest period since 113 B.C. in which no army has crossed the Rhine with war-like intentions. The very idea of war between the European Union's member States seems as remote as to be nonsensical. The creation of the European Union (EU); a legal, political, economic, cultural, and soon to be military entity, is one of the greatest economic experiments in the history of Mankind. The shape and scope of the EU has the capacity to affect the lives of hundreds of millions of people in different ways, some positive, some negative. Thus a careful study of this experiment is in order.

This module uses economics to understand the history of the EU, its significance in terms of the post 1945 World Economy, the EU's international interactions with the rest of the world, its development up to today, and the prospects for change most likely in the future. Using economic theory as a lens we will use real world examples,
data, and current topics to inform our discussions on the evolution of the European Union.

**Syllabus:** The module is divided into eight sections set out below. Worksheets corresponding to each topic will aid students revise the module content. Core texts will support lecture material along with references and recommended readings for each topic, where relevant.

**Topic 1**
Introduction to the Course

**History of European Integration since the beginning of the 20th century.**

**Topic 2**
Economic Growth in Europe

- Growth in Europe: Facts and Figures
- Growth effects and factor market integration
- Solow’s Long Term Growth Model

**Topic 3**
Trade Theory and the EU

- Absolute Advantage
- Comparative Advantage
- Production Possibility Frontier
- Standard Trade Model

**Topic 4**
EU Trade Policy

- EU Trade Effects
- Tariffs
- Quotas
- Welfare analysis of trade
- Measuring consumers’ and producers’ surplus in an open economy

**Topic 5**
History and Future of the Common Agricultural Policy

**Topic 6**
Sustainability including environment, trade and labour markets and of multinational enterprises (MNEs), and Public Policies will all be appraised at the level of the European Union evolving in a globalised context.

**Syllabus:**

- 1. Introduction (Scope and Method of Industrial Economics, S-C-P paradigm...).
- 2. Theories of the firm: Neoclassical and others
- 3. Market Structure
- 4. Structure and Strategy (Oligopoly Theory - Cournot and Bertrand duopoly models)
- 5. Non price strategies
- 6. Technological Innovation

**Barriers to entry in the case of the EU**

**Performance of firms (performance indicators and performance of EU firms)**

**A Case Study: the EU Banking Industry**

**Multinational enterprises, globalisation and regionalism**

**The emerging global ‘Asian’ firm (keiretsu, Chaebol and Chinese SOE)**

**EU Policy with regard to industry**

**Prerequisites:** EC4102, EC4101, EC4004

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**EC4407 - IRELAND IN THE WORLD ECONOMY**

**ECTS Credits:** 6

**Economics**

**Rationale and Purpose of the Module:** This course deals with important macro and microeconomic issues and problems facing the Irish economy in the context of its status as one of the most globally integrated economies. The course covers characteristics of the economy such as demographic and labour market characteristics and distributional aspects. It also examines the principal sectors of the economy including agriculture, services and manufacturing.

- It emphasises the challenges posed by increased integration in the international economy including questions of immigration and environmental sustainability.

**Syllabus:**

- The course begins with a review of the history and characteristics of the Irish economy in terms of its transition to a relatively small closed economy to a regional economy with high levels of integration with the global economy.
- It covers recent demographic and labour market trends as well as distributional issues including poverty and income distribution.
- It proceeds to cover the policy and performance of the agriculture, services and manufacturing sectors. This is followed by the conduct of supply side policies such as competition and regulation policy.
- The course also covers the issues arising from the increased integration of emerging economies such as China as well as developing economies and the challenges posed by their development in terms of different aspects of sustainability including environment, trade and labour market issues.

**Prerequisites:** EC4101, EC4102

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**EC4427 - MANAGERIAL ECONOMICS**

**ECTS Credits:** 6

**Economics**

**Rationale and Purpose of the Module:** This module aims to provide students with insights into how economics can aid managerial decision making within firms that operate in an increasingly global environment. Reflecting the highly globalized nature of tastes, production, labor markets, and financial markets in today’s world it provides tools for understanding managerial decision making under conditions of certainty and uncertainty (including risk analysis).

- It examines the nature of the firm in the global economy and different models of corporate governance.
- It covers economic approaches to decision making on production and cost. It also explores decision making on the demand side of the firm by covering demand estimation and differnet models of pricing.

**Syllabus:** The module begins with economic perspectives on the firm including neo-classical, managerial discretion and behavioural models. It also covers property rights and transaction cost perspectives of the firm. It explores how economic theory contributes a perspective on corporate governance and examines international models.
of corporate governance. It examines decision making in relation to production using cost and production theory. It proceeds to cover demand side issues such as demand estimation, demand analysis and pricing. It extends pricing analysis by covering prices under different market structures such as different models of oligopoly. It examines the make or buy decision in the context of the boundaries of the firm and the growing prevalence of outsourcing in a global context. It also examines decision making under conditions of risk and uncertainty.

Prerequisites: EC4101, EC4102, EC4004

**ECTS Credits: 6**

**EDS011 - DIGITAL ELECTRONICS 1**

**ECTS Credits: 6**

**Electronic & Computer Engineering**

**Rationale and Purpose of the Module:** The aim of the module is to give students an introduction to many of the important hardware elements and topics in digital circuits.

**Syllabus:** The difference between digital and analogue signals

- Binary numbers (unsigned) and how they can represent an analogue signal
- Number systems and codes, Hexadecimal, ASCII code
- Simple ADC and DAC concepts
- Logic Gates: AND, OR and INVERTER gates and their truth tables
- Representing data in parallel and in serial form, RS232 Buses and addressing: the concept of selecting a device by decoding a number on an address bus
- Memory devices: basic types (NO internal workings) of semiconductor memory and how they are used
- LED displays: including single LEDs and 7-segment displays and how to drive them
- Modern Basics
- Sequential circuits: D-type flip-flops and registers; Counters and their applications; Shift registers and serial to parallel conversion (and vice-versa); Simple state diagrams
- Mass Storage: Discs, Magnetic storage, sectors, data rates, Optical storage; Flash memory

**EDS021 - C++ PROGRAMMING**

**ECTS Credits: 6**

**Electronic & Computer Engineering**

**Rationale and Purpose of the Module:** To introduce the C++ language and develop C++ programming skills.


**EDS031 - SOFTWARE ENGINEERING**

**ECTS Credits: 6**

**Electronic & Computer Engineering**

**Rationale and Purpose of the Module:** To understand and apply the object-oriented approach to software development. To emphasise Good Software Engineering Practices. To enhance individual and team working skills via individual investigative project and presentation, individual exercises and a team project.

**Syllabus:** Object Oriented Analysis/Design: Object Oriented Paradigms (one in detail e.g. OMT/UML) focusing on architecture and behavioural design and representation. Use Cases: Design Patterns. Software Reuse. Overview of Object Oriented Programming Languages.
Rationale and Purpose of the Module: To provide students with a uni?ed view of the ?eld of multimedia communications and networking infras- tructures and an understanding of how data is represented and reliably transmitted over different media. To provide students with an understanding of the structure of the Internet and world-wide web. To outline the major topics associated with multimedia communications (inter alia/ applications, networks, protocols and standards). To equip students to quantify the communications requirements of various multimedia applications, and the computational overhead of their underlying network protocols.


EE4003 - THE ENGINEER AS A PROFESSIONAL
ECTS Credits: 6
Electronic & Computer Engineering

Rationale and Purpose of the Module: The engineering profession demands more than just technical knowledge as well as the ability to express ideas, to assume leadership, to operate within teams (sometimes interdisciplinary) and organisations and to make ethically considered decisions.

3. The Engineer as a Professional. Professions & The Engineering Profession, Professional Bodies, Life Long Learning & Continuous Professional Development
4. Engineering Ethics, Engineers in Society, Responsibility in Engineering, Common Morality & Codes of Ethics, Analysing the Problem, Utilitarian & Respect for Persons

Philosophies, Creative Middle Ways

EE4005 - ELECTRICAL POWER SYSTEMS
ECTS Credits: 6
Electronic & Computer Engineering

EE4011 - ENGINEERING COMPUTING
ECTS Credits: 6
Electronic & Computer Engineering

Rationale and Purpose of the Module: Engineering computing is the use of computers, software and numerical methods to solve scientific and engineering problems. The module has two distinct aspects. Firstly, the module aims to introduce students to a number of basic numerical methods commonly used in solving engineering problems and the concepts necessary to implement them in a relevant engineering software package. The second aim is to introduce students to a high level object-oriented programming language and a software development environment.

operation, transient conditions, unbalanced loading or faults, operation connected to infinite/non-infinite busbars, stability margin, operational limits, operation at leading power factor, governors and frequency control. Power Factor Correction: Single-phase and three-phase power factor correction. Utility and consumer power factor correction. Active power factor correction and filters. Voltage Regulation: Voltage control standards: methods of voltage control, generator, reactive injection, series compensation, tap-changing, coordination of voltage regulation, voltage control and reactive power.

Syllabus: The students will learn about the fundamental principles of Biomedical engineering, Mechanical engineering, Computer Aided Engineering and Design, Aeronautical engineering, Civil engineering, Chemical and Biochemical engineering, Electronic and Computer engineering, and Design and Manufacturing engineering. Engineers need to be familiar with general engineering practice and with the particular practices of their discipline. Principal amongst these will be the methodology of design and operational practice within their discipline. Engineering is directed to developing, providing and maintaining infrastructure, goods, systems and services for industry and the community in a sustainable manner. It is important that graduate engineers are thoroughly versed in the engineering technologies relevant to their chosen discipline. Examples would include; telecommunications, power systems, control systems, algorithms, data structures, manufacturing processes, highway construction, aeronautical engineering etc. Students will also have the opportunity to become involved in multi-disciplinary projects which require them to draw upon technologies outside their immediate area of interest.

EE4023 - DISTRIBUTED SYSTEMS
ECTS Credits: 6

Electronic & Computer Engineering

Rationale and Purpose of the Module: This module is designed to provide students with a framework for comparing emerging distributed systems, as well as an understanding of the algorithms necessary to support a distributed system. Computing models and data communications will be studied, as well as software development issues relating to the development of distributed applications. Potential security threats in distributed systems will also be discussed.


DISTRIBUTED PARAMETER CIRCUITS: Lossless transmission lines, derivation of wave velocity and characteristic impedance. Step propagation, reflection coefficient, multiple reflections, matched termination. Properties of selected lines, e.g., coaxial cable, PCB tracks, ribbon cable. (Sinusoidal response and SWR are covered elsewhere).

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EE4313 - ACTIVE CIRCUIT DESIGN 1
ECTS Credits: 6

Electronic & Computer Engineering

Rationale and Purpose of the Module: Introduction to Active Circuit Design and Analysis.

Syllabus: REVIEW OF BASIC CIRCUIT ANALYSIS- Basic Circuit Elements, Phasors and Complex Impedence, Circuit Analysis TheoremsAC
CIRCUIT ANALYSIS ô Combining impedances, frequency response, source conversions, Thevenin and Norton Equivalent Circuits, Mesh and Nodal Analysis, Bridge Networks, D-Y and Y-D conversions.
RESONANCE ô Series and Parallel Resonance
CircuitsAMPLIFIERS: Properties of an “ideal” amplifier.

Input and Output impedance. Introduce the Operational Amplifier as an approximation of an ideal amplifier. Simple inverting and non-inverting amplifier circuits.

SMALL-SIGNAL MODELS: Modelling of simple MOS and BJT amplifiers.

AMPLIFIER TYPES: Characteristics of common-emitter (common source), common-base (common gate) and common-collector (common-drain) topologies. Gain characteristics, input, output impedences and key application strengths of each type.

Prerequisites: EE4102

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EE4407 - ASICS 1
ECTS Credits: 6

Electronic & Computer Engineering

Rationale and Purpose of the Module: This module concentrates on the design of digital ASIC (application specific integrated circuits).

EDA Tools.
Description of combinational and sequential digital systems in the Verilog or VHDL Hardware description language (HDL):
Test benches and verification using HDLs. Synthesizeable HDL constructs and inference of common digital structures.
CMOS digital circuit design.
The MOS transistor and long channel model. Parasitic capacitances. Introduction to the short channel model. The static CMOS inverter and its static and dynamic performance.
Static CMOS logic gates, composite CMOS gates and switch based logic.
CMOS latches and flip-flops for ASIC design.
Example common ASIC blocks: adders and multipliers.

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EE4523 - DIGITAL SYSTEMS 2
ECTS Credits: 6

Electronic & Computer Engineering

Rationale and Purpose of the Module: The module covers digital system topics including: Fully synchronous systems; Finite State Machines(FSM); Mealy and Moore type FSMs; Hardware Description Languages and RTL modelling. Modern digital design requires designers to use HDLs for design and verification. (Digital Systems 1 on the programme is a prerequisite for this module.)


Hardware Description Languages: The nature and use of HDLs. Hierarchical modelling concepts and structural specification of logic circuits. Gate-level modelling. Behavioural modelling. Description of basic digital circuits using a HDL.

Register-Transfer-Level (RTL) description.

Design flow and CAD tools. HDL code for FSMs (E.g. serial multiplier).

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EE6011 - CRYPTOGRAPHY AND SECURITY FUNDAMENTALS
ECTS Credits: 6

Electronic & Computer Engineering

Rationale and Purpose of the Module: Introduce cryptography & security fundamentals, including security threats and vulnerabilities as well as security services for modern e-commerce and mobile applications.
Syllabus: [Introduction to information and network security] Why security is an important issue.
[Threats and vulnerabilities] Threats from passive and active attackers, such as: identity interception, masquerade, replay, data interception, manipulation, repudiation, denial-of-service, traffic-analysis, mis-routing and digital pests such as: trojan horse, virus, worms.
[Security services, components and policies] Security services such as: data confidentiality, data integrity and Email security. Security policies. Access control mechanisms.
[Cryptography] Introduction of classical and modern cryptographic techniques and demonstration of the application of cryptography in the provision of security services.
[Symmetric-key cryptography] Stream ciphers and classical Feistel-block ciphers. Examples such as: DES, IDEA, RC-5 and AES.
[Introduction to Cryptanalysis] Cryptanalysis of classical ciphers and determination of cipher strength.
[Key management] Key distribution, key-sharing. Use of key distribution centres, authentication servers and certification authorities.

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EE6031 - MULTIMEDIA COMMUNICATIONS  
ECTS Credits: 6  
Electronic & Computer Engineering

Rationale and Purpose of the Module: Provides students with an understanding of applications and networking infrastructures used in communications for data in form of text, images, audio and video.


Local and wide area networks.  
Routing and Internetworking operation.  
Internet and Internetwork protocols  
Transport level protocols  
Client Server Model  
Application Layer  
ISDN and B-ISDN  
The world-wide web.  
Multimedia applications

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EE6411 - C++ PROGRAMMING  
ECTS Credits: 6  
Electronic & Computer Engineering

Rationale and Purpose of the Module: To introduce the C++ language and develop C++ programming skills.

Syllabus: Basic C++; syntax and semantics of the C++ procedural subset.  
Objects and Classes; what a C++ object is and how it is defined by the use of a C++ Class. The use of C++ classes to represent abstract data types.  
Function and Operator Overloading: function polymorphism.  
Inheritance and Polymorphism: software re-use via composition, inheritance and object polymorphism.  
Input and Output: introduction to the iostream library.  
Memory Management: the new and delete operators; memory leaks and the use of programs such as purify to detect them.  
Templates: class and function templates as a way of writing reusable software. The Standard Template Library: introduction to the components and their use.  
Exception handling: throw, try and catch.  

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EE6421 - SOFTWARE ENGINEERING  
ECTS Credits: 6  
Electronic & Computer Engineering

Rationale and Purpose of the Module: To understand and apply the object-oriented approach to software development. To emphasise Good Software Engineering Practices. To enhance individual and team working skills via individual investigative project and presentation, individual exercises and a team project.

Syllabus: Object Oriented Analysis/Design: Object Oriented Paradigms (one in detail e.g. OMT/UML) focusing on architecture and behavioural design and representation. Use Cases. Design Patterns. Software Reuse.

Overview of Object Oriented Programming Languages (e.g. Java/Smalltalk). Individual Project/Case Study. Team Project in the area of Software Design for Advanced Communication Systems (e.g. Call Handling and Mobility Management Systems for the 3rd generation mobile system, UMTS).

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EE6451 - DIGITAL SIGNAL PROCESSING  
ECTS Credits: 6  
Electronic & Computer Engineering

Rationale and Purpose of the Module: To introduce the theory of digital signal processing, including the following very important topics: the discrete Fourier Transform, the Z-transform and digital ?ilter design.

EE6461 - INFORMATION THEORY AND CODING
ECTS Credits: 6
Electronic & Computer Engineering

Rationale and Purpose of the Module: This module aims to guide the student through the implications and consequences of fundamental theories and laws of information theory and to impart a comprehensive grounding in source coding, random and burst error protection coding theory with reference to their increasingly wide application in present day digital communications and computer systems.


EE6471 - ADVANCED DIGITAL SYSTEM DESIGN
ECTS Credits: 6
Electronic & Computer Engineering

Rationale and Purpose of the Module: This module aims to equip the student with a range of techniques applicable to the design and test of very high speed and fault-tolerant digital circuits.

Syllabus: Review: High-speed design in the time and frequency domains; re:ection, ringing and crosstalk, transmission lines. Transmission lines and termination strategies: Series, Thévenin, diode and AC terminations; Crosstalk, re:ections, ground bounce. Properties and behaviour of stripline and microstrip traces. Technology review: LVDS, ECL/PECL, GTL, SSTL, HSTL, and high-speed CMOS drivers and receivers; mixed voltage systems; bus-hold and bus-loading considerations; hot insertion. Synchronous Design: Clock oscillators and buffering, Clock Distribution, Metastability. System Design and Manufacture: PCB materials; Layer build and spec:ation; Power supply considerations; Decoupling techniques. EMC/ESD: Radiated vs conducted; Filtering; Effects of apertures, gasketing; Conducted emissions, coaxial cables, twisted pair; Shielding. Thermal Aspects: Sources of heat; Thermal resistance; Basic air:ow models; Impact on reliability; Altitude Effects. Reliability: Bathub curves; Highly Accelerated Life Testing (HALT). Models and Simulation: Spice and IBIS-based simulations. Fault-tolerance and redundancy: Fault-tolerant digital circuits. Architecture of fault-tolerant computers.

EH4007 - LITERARY MODERNISM
ECTS Credits: 6
School of Culture and Communication

Rationale and Purpose of the Module: This module studies British literature from the turn of the twentieth century to the end of the Second World War. Students will explore the turn to interiority and experimental modes of writing and will become familiar with major historical, political and social factors involved in this turn. Topics will include the impact of the two world wars; the influence of major theorists of the mind such as Freud, Jung, William James and Melanie Klein; the cross-fertilisation of the arts, including painting, film and photography; the role of the Cambridge Ritualists and the archaeological discoveries; the battle for suffrage and the subsequent debate about the nature of gender and the relation between and among the sexes.

Syllabus: This module covers British literature from 1900-1945. Writers will include major novelists of the period such as E.M. Forster, D.H. Lawrence, Virginia Woolf and James Joyce; and/or major poets such as T.S. Eliot, William Butler Yeats, W.H. Auden and the poets of the First World War. In defining the themes and interpreting the literature of the period, attention is paid to political, social and cultural constructs (for example, the World Wars, the suffrage movement, the impact of other art forms), to significant concepts and philosophies (for example, Primitivism, psychoanalysis, physics) and to literary movements (for example, Bloomsbury).

EH4001 - CRITICAL PRACTICE 1: ACADEMIC READING AND WRITING
ECTS Credits: 6
School of Culture and Communication

Rationale and Purpose of the Module: This module aims to develop the skills of analysis and critical writing with a focus on literature(s) in English.

Syllabus: Intended as a foundational course for students moving from second to third level models of studying literature(s) in English, students will be introduced to the basic skills necessary to develop critical readings of literary texts. Literary genres will be addressed within the module with primary texts drawn from British and American prose fiction. Basic elements of literary theory will also be introduced.

EH4003 - INTRODUCTION TO LITERARY THEORY
ECTS Credits: 6
School of Culture and Communication

Rationale and Purpose of the Module: The aim of this module is to unsettle common sense approaches to literature in English and to theorise the ways in which literature is produced, received and interpreted.

Syllabus: The module provides an introduction to literary theory, incorporating modes of analysis which emphasise the relationships of literature to issues of race, class, and gender. Though theory will be introduced historically, twentieth century literary theory will make up the core of the module. Students are encouraged to compare and contrast the various models of literary discussion presented during the course, and to think about how the following models might be applied to texts: Russian Formalism; ‘new’ criticism; reader-response criticism; psychoanalytic criticism; Marxist criticism; structuralism, post-structuralism, feminism, deconstruction, cultural materialism, new historicism, queer theory and post-colonialism.

EH4013 - SENSIBILITY AND ROMANTICISM
ECTS Credits: 6
School of Culture and Communication

Rationale and Purpose of the Module: This module provides students with a survey of English literature of the eighteenth and early nineteenth centuries, a period in which literature was involved with, and inspired by, revolutionary political activity.

Syllabus: Inspired and subsequently alarmed by French and American revolutions, the writers of this period grappled with issues of race, slavery, gender, democracy, and republicanism. The module will begin with examples of the anxious introspection which characterises the poetry of sensibility; from this point forward is traced a shift from a negative and trivialising concept of ‘the romantic’ to an aesthetic of sentiment and sympathy; from this point forward is also traced a shift from the anxious introspection which characterises the poetry of sensibility; from this point forward is traced a shift from a negative and trivialising concept of ‘the romantic’ to an aesthetic of sentiment and sympathy; from this point forward is also traced a shift from a negative and trivialising concept of ‘the romantic’ to an aesthetic of sentiment and sympathy.

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EH4023 - THE NEW WORLD: AMERICAN LITERATURE TO 1890
ECTS Credits: 6

School of Culture and Communication

Rationale and Purpose of the Module: This module offers students a survey of some of the primary literary themes and cultural concerns that have contributed to the formulation of a distinct tradition of American literature from the initial colonisation of the continent to 1890.

Syllabus: American literature pre-1620 (for example, Columbus, de Vaca, Harriot, Smith); American literature from 1620 to the early 18th century (for example, Bradford, Bradstreet, Rowlandson, Byrd); the Puritan influence (for example, Williams, Taylor, Mather, Edwards); the Age of Enlightenment and Revolution 1750-1820 (for example, Paine, Jefferson, The Federalist, Murray); 19th century American literature (for example, Emerson, Hawthorne, Thoreau, Whitman, Melville, Dickinson); incipient American modernism.

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EH4027 - CONTEMPORARY WOMEN’S WRITING
ECTS Credits: 6

School of Culture and Communication

Rationale and Purpose of the Module: To introduce students to key texts and themes in contemporary women’s writing; to introduce students to critical methodologies for the analysis of gender in literary texts.

Syllabus: This course will introduce students to a number of key fictions by British and North American women authors, written between the 1970s and the present day. We will examine the ways in which these fictions respond to the changes in female experience in the second half of the twentieth and beginning of the twenty-first century, as well as exploring how these fictions reflect upon, and re-figure, conventional understandings of gender identity. Key issues for discussion will be the ways in which the texts respond to their social and cultural contexts, and how gender identity is shaped by location and place in these fictions. We will also explore the significant motifs that emerge across texts, such as women and madness; mother-daughter relationships; femininity and desire; fantasy and romance; the body; and the writing of race and gender.

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EH4028 - STUDY OF A MAJOR IRISH AUTHOR
ECTS Credits: 6

School of Culture and Communication

Rationale and Purpose of the Module: This module offers students the opportunity to engage in intensive study of an author whose work has significantly affected the traditions of Irish literature written in English. Students will read an extensive selection of the authors works in order to understand fully his/her individual development and his/her important contributions to literary history.

On successful completion of this module, students will have gained

An understanding of the author in his/her political, historical, and cultural contexts;
Familiarity with a range of the authors works and with a range of his/her thematic, stylistic, aesthetic, and formal concerns;
An understanding of the authors importance in the literary canon;
An understanding of different theoretical and methodological ways of interpreting the major author.

Syllabus: This module will function as a critical survey of the work of a major Irish author. Students will study the authors development from early efforts to mature output and will analyse and discuss the authors overall impact on literary history. The module will position the author historically and politically, considering the authors role as a contributor to intellectual history. By locating the author in different theoretical and methodological frameworks, students will have the opportunity to assess and interpret a wide range of the authors work.

Example One - James Joyce
Addressing the production of Irish cultural and social identities in these texts, students will construct readings of
Joyce’s work using contemporary literary and cultural theory. Focusing on the major fictions of Joyce, the module will also consider his prose and life-writing, and explore the interconnections between these various writings. Joyce’s literary experimentation provides an opportunity to explore narrative form and technique and so the module will consider the ways in which literary conventions and cultural discourses are challenged in his work. Given the range of new media available in this field as well as Joyce’s own commitment to film, we will explore a number of methods of reading Joyce from photographs, to archive footage, to the contemporary documentaries about and film productions of his work, to the Joyce hypertext and other online resources.

**Rationale and Purpose of the Module:**

School of Culture and Communication

**ECTS Credits:** 6

Writing activities, working collectively and individually to develop effective writing. Students will participate in regular writing activities, working collectively and individually to develop effective writing. Students will benefit from lectures and discussions on writing, as well as workshops and smaller group discussions. The module will introduce students to a range of Irish literary work and cultural movements in the period 1880–1930. It aims to introduce students to selected literature from this revolutionary period in Irish culture, attending to innovations in style, structure, and genre in the period, and concentrating on formal as well as cultural experimentation.

Background: from the 1880s on, the ‘Irish Question’ was a central site of struggle in British and Irish public discourse, and in this turbulent period a new generation of writers began to interact with this and other questions in their literary work. Writers such as W. B. Yeats, J. M. Synge, Lady Gregory, George Moore, and Eva Gore-Booth identified (temporarily, in some cases) with cultural nationalism, and became associated with the Irish Literary Revival and cultural arenas including the Abbey Theatre and the Gaelic League. Decadent and ‘New Woman’ writers Oscar Wilde, George Egerton, and Sarah Grand, resisted hegemonies of a different kind, subverting gender and sexual identities and challenging prescribed roles in the family. Against the backdrop of an emerging socialist movement, writers such as G. B. Shaw and Seán O’Casey, tackled class activism; while others, including Anna Parnell, Roger Casement, Ernie O’Malley, and Maud Gonne began to write autobiographical accounts of their involvement in Irish national struggles. Over the course of this period, the work of James Joyce began to draw on these radical discourses and other transnational literary movements in the production of his important literary experiments.

**Syllabus:**

- Exploring selected Irish writers and literary movements 1880–1930, this module aims to introduce learners to one of the most radical periods in Irish culture. Attending to formal and cultural experimentation, and drawing on a range of literary genres, the module will explore the local and transnational dynamics of the Irish literary world. By developing a “thick description” of the period, the module aims to enable students to become better critical thinkers and literary researchers by focusing on close reading, on comparative studies of different writers and (sometimes intersecting) literary movements, and on the reception and critical analysis of this material at the time and since.

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**EH4037 - INTRODUCTION TO CREATIVE WRITING**

**ECTS Credits:** 6

**School of Culture and Communication**

**Rationale and Purpose of the Module:** There is a strong tradition in the Limerick area of creative writing which includes the works of writers such as Kate O’Brien, Frank McCourt, and Kevin Barry. With the creation of the new McCourt Chair in Creative Writing, a general module is needed out of which the first steps towards the creation of undergraduate and graduate creative writing streams might be taken.

**Syllabus:** Ireland has a long and well established tradition of excellence in the genre of short story, theatrical, creative non-fiction and poetry writing. This creative writing module draws on that tradition and offers students an opportunity to develop their skills in creative writing in these four genres. Students will benefit from lectures and workshops in which they will learn about the practices of other writers, and from the exploration of strategies for effective writing. Students will participate in regular writing activities, working collectively and individually to complete a piece of work in their chosen genre.

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**EH4043 - IRISH LITERARY REVOLUTIONS 1880–1930**

**ECTS Credits:** 6

**School of Culture and Communication**

**Rationale and Purpose of the Module:** This module replaces and re-situates in second year an earlier first year module (EH4111 - The Irish Literary Revival). It is a revised and updated module which covers the period of the Revival but also broadens the canon. It will introduce students to a range of Irish literary work and cultural movements in the period 1880–1930. It aims to introduce students to selected literature from this revolutionary period in Irish culture, attending to innovations in style, structure, and genre in the period, and concentrating on formal as well as cultural experimentation.

**Syllabus:**

- The Irish Literary Revival. It aims to introduce students to selected literature from this revolutionary period in Irish culture, attending to innovations in style, structure, and genre in the period, and concentrating on formal as well as cultural experimentation.

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**EN4015 - CURRICULUM AND POLICY STUDIES**

**ECTS Credits:** 6

**School of Education**

**Rationale and Purpose of the Module:** In this module students will be invited to develop their thinking and understanding on the contested nature of the curriculum and policy-making processes in both the national and international arenas. They will become more aware of the influence and increasing significance of national and international organisations on their practice as teachers.

**Syllabus:** The definitions of curriculum as content and experience as well as hidden curriculum; the philosophical and ideological foundations of curriculum are considered from the perspectives of knowledge, society and the individual; the dynamics of curriculum development and policy reform in education; the particularities of curriculum and policy-making development in the Irish context; curriculum and policy developments in education internationally; influence of national and international bodies on education policy and curriculum-making processes nationally; partnership approach; recent curriculum policy developments; core curriculum; the work of the NCCA and their proposals for post-primary reform; curriculum change, reform, innovation and development; curriculum design; key factors associated with the adoption, implementation, dissemination and evaluation of curriculum reform; impact of school and teacher culture on curriculum reform efforts; case studies of recent curriculum reforms; the pedagogy and assessment of the curriculum; purposes, modes and techniques of assessment; assessment for learning; contemporary national and international curriculum issues; some radical alternatives.

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**EN4025 - INCLUSIVE EDUCATION 1:**

**CONTEMPORARY PERSPECTIVES**

**ECTS Credits:** 6

**School of Education**

**Rationale and Purpose of the Module:** Irish society has experienced unprecedented demographic change in recent times resulting in educators responding quickly to the changing nature of cultural diversity in the classroom and other learning communities. This module seeks to explore, recognise and appreciate new expressions of race and culture with the aim of developing students’ awareness and understanding of diversity in society and
School of Education

Rationale and Purpose of the Module: This module requires students to take a detailed look at a variety of planning and teaching skills and concepts that combine to make a teacher effective in the classroom. Students are introduced to the complexities of planning and preparation for student-centred learning in preparation for their school placement in semester 4. A particular emphasis will be placed on planning, implementing learning strategies, assessment and evaluation of practice.

Syllabus: This module will introduce students to the various elements required to establish and maintain an effective/positive learning environment - communication (theory, skills and dynamics); the relational art of teaching; group dynamics. Students will be introduced to models of planning/curriculum models (product, process, teaching; group dynamic theories); learning outcomes (behavioural/non-behavioural); planning and preparing schemes of work and lesson plans. Students will have the opportunity to implement these plans in small group settings with young people (Micro-Teaching) and reflect on their own learning from this experience.

EN4033 - PLANNING FOR LEARNING
ECTS Credits: 6

School of Education

Rationale and Purpose of the Module: During this module students will be exposed to some of the major contemporary thinkers in education. They will be encouraged to critically analyse these through the lens of deconstruction of their own very recent experiences of schooling. It is intended that the module will foster amongst students an appreciation of the interplay between educational theory and practice. Through induction into the scholarship of education, the module will aim to foster an understanding of teacher identity through critical engagement with the nature and purpose of education.

Syllabus: A brief overview of development of early influential thinkers in education exploring the core question what is education: Plato/Socrates (dialogic perspective); Descartes (enlightenment thinking and logical rationalism); Rousseau (Emile) exploration of modern thinkers that have influenced education Dewey (experience and democracy in education) Buber (on relationship); Frankyl (meaning making). An overview of schooling exploring the core question what is schooling; Illich (de-schooling society) Bourdieu & Lortie (cultural reproduction & deconstruction of the apprenticeship of observation) Freire & McLaren (critical pedagogy); Eisner (the art and appreciation of education) Greene (imagination and education); Sugrue (deconstructing lay theories of teaching); Lessing and Robinson (indoctrination and changing educational paradigms); Palmer (courage in teaching).

EN4043 - UNDERSTANDING CLASSROOM PRACTICES
ECTS Credits: 6

School of Education

Rationale and Purpose of the Module: This module focuses on the development of knowledge, skills, and attitudes which will support student teachers in preparing for School Placement (SP) in the spring semester by developing their capacity to engage in and reflect upon effective planning, preparation and management of learning environments.

Syllabus: Students are provided with an introduction to the complexities of teaching to help students fulfil their role as facilitators of learning drawing upon Evidence Based Practice; Teacher as Researcher; Pedagogical Strategies; Classroom Management; Assessment for/of learning; benefits and limitations of using statistical analysis strategies to determine the effectiveness of pedagogical approaches. This module will help students to understand schools and the dominant teaching approaches that are used within them by looking at the history of Irish post-primary schools - educational provision in modern Ireland (school type; patronage/governance). The concept of the reflective practitioner will be central to this module where students will be given an introduction to the knowledge, skills and practices of reflection. The module examines the requirements of the Teaching Council and other bodies in relation to professional conduct, and child welfare issues.
EN6161 - UNDERSTANDING LEARNING
ECTS Credits: 6
School of Education

Rationale and Purpose of the Module: The purpose of this module is to introduce students to different theoretical views of how people learn and the factors influencing this learning. Employing an evidence-based perspective, it aims to challenge the lay theories often associated with learning as a result of formal educational practices.

Syllabus: The purpose of this module is to provide students with a critical understanding of key topics in learning theory, examining behavioural, cognitive and constructivist theory. The role of motivation is also discussed and an introduction to learner differences is included. Several concepts, such as intelligence and learning style will be critically examined as part of this module. An introduction is given to the personal, social and emotional development of young people, including ways in which this impacts on the second level school. Students will reflect on their own learning and show an awareness of how their approach differs from that of others. Students will be introduced to key educational thinkers and will be expected to develop an initial outline of their own educational philosophy.

EP4005 - NEW ENTERPRISE CREATION
ECTS Credits: 6

Management and Marketing

Rationale and Purpose of the Module: Small firms are a critical component of the Irish economy and play key roles in the stimulation and development of all economies. In recent years high-profile success of both Irish and international entrepreneurs in building profitable business has been inspiring. Creating a new enterprise is a challenging task, one that requires specific knowledge as well as general business and entrepreneurial skills. Successful entrepreneurship and the transformation of creative ideas into commercially viable businesses requires more than merely luck and money. It is a cohesive process of creativity, risk taking and business planning. This module will expose students to the process of opportunity recognition, the elements of business planning and provides hands-on experience in the creation and development of a new business enterprise. Students will apply the knowledge they learn in the classroom to real-world business opportunities and subsequently will develop a more entrepreneurial mindset.

Syllabus: The aim of this module is to provide students with an understanding of the stages involved in creating a new venture, including the development of skills in evaluating, preparing and presenting a business plan. It will provide an entrepreneurial mindset and a sense of entrepreneurial behaviour, which can be effectively used in a number of different work environments. The module will facilitate students in the development and application of the analytical and decision-making skills necessary in formulating, implementing and controlling a business plan. The module will also establish project credibility and improve students’ presentation and communication skills. The module will therefore address the following:
- the importance of SMEs and business planning
- developing and screening business ideas
- feasibility analysis
- components of the business plan
- financing options for the business
- presenting the business plan with confidence

EP4315 - ENTERPRISE FORMATION
ECTS Credits: 6

Management and Marketing

Rationale and Purpose of the Module: The aim of the module is to provide participants with an understanding of the entrepreneurial process and the role of small firms in economic development. Students will also benefit from identifying the external and internal factors that impact on business start-up. Students are expected to prepare a feasibility analysis on a business idea to examine the viability of starting this business in a real-life situation.

Syllabus: Mode of Instruction is lecture and tutorials workshops. Knowledge is structured in two main sections, theory and application of theory to real life economic conditions. Initially the concepts and factors affecting the entrepreneurial process are imparted to students, following which students work together in teams engaging in experiential learning in assessing the feasibility and viability of their business idea.

EP4407 - ENTERPRISE DEVELOPMENT
ECTS Credits: 6

Management and Marketing

Rationale and Purpose of the Module: Creating a new venture is a challenging task, one that requires specific technical and business knowledge as well as general business and entrepreneurial skills and competencies. The aim of this module is to introduce students to the stages involved in the establishment and management of a new business. This includes opportunity recognition, analysis of market potential, the analysis and acquisition of resources required to capture market opportunities and the launch of a new business. In addition the module content explores the backgrounds, motivations, characteristics and skills of enterprising individuals. On completion of the module the student will have a better understanding of the issues involved in forming a business enterprise. The module will serve as a strong foundation for those aspiring to own and operate their own business.

Syllabus: The module will address the following topics: Understanding the role and importance of the small firm sector to the Irish economy. The entrepreneur/owner/manager characteristics and classifications; identification and evaluation of business opportunities; product/service development; market research; industry analysis; market/sales strategies; management structure; manufacturing/operations; sources of start-up finance; financial projections (projected cashflow, profit and loss and balance sheet); managing the new business (people and process management) and exit strategies for a new business.

EQ4013 - FOUNDATIONS OF EQUINE LOCOMOTION
ECTS Credits: 6

Biological Sciences

Rationale and Purpose of the Module: The module provides students with the knowledge on the principles of athletic movement in the horse, which includes simple gait evaluation and consideration of various factors that impinge on efficient movement / locomotion. The module also develops a greater understanding of the physical preparations necessary for performance and the use of effective and efficient training and post exercise. These are key skills in industry to prevent and recognise injury and maximise performance in race and sport horses.
Syllabus: Locomotion; the role of nervous, skeletal and muscular systems in locomotion, use of body segments - head and neck, back and ribs, hindquarters, ring of locomotion, limiting factors - joint range of movement, injury, willingness, opposing muscle groups, stance and flight phases of movement, simple gait - walk, trot, canter, gallop. Common misconceptions in equine movement. Qualitative and quantitative analysis of equine movement, comparison with competition requirements, locomotion and soundness. Common simple gait abnormalities; lateral and medial deviation, skeletal foundations of gait abnormality, farriery and gait abnormality. Video analysis of simple gait abnormality. Developing equine movement; use of simple techniques on the flat over ground poles and jumping to promote efficiency, co-ordination and power in equine movement. Factors affecting equine locomotion; tack and equipment, the rider, ground surfaces. Lungeing methods and equipment, loose schooling methods and safe practice in accordance to established guidelines.

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**EQ4025 - THE YOUNG HORSE**  
ECTS Credits: 6

**Biological Sciences**

Rationale and Purpose of the Module: The module provides the students with the skill to examine the physical and mental pre-requisites for training the young horse, which includes the evaluation of young horse conformation, maturity and developmental stage of the horse ready to begin training. Additionally, it aims to develop the students ability to critically evaluate different training approaches and techniques commonly used in industry in the context of horse behaviour, welfare and learning ability, which are critical skills necessary to evaluate the effectiveness and ethics of standard industry practices currently in use.

Syllabus: Conformation and suitability; indicators of maturity, estimation of maturity, suitability for purpose, muscular development. Training the young horse; behavioural bases, alternative approaches, developing understanding of and obedience to simple cues, timing of initial training by discipline and maturity, commonly used approaches for sport horses and racehorses, establishing trust and confidence, improving balance and strength, developing athletic technique on the flat and jumping both loose and on the lunge, accustoming the horse to the rider early riding of the young horse. Equipment; lungeing and longreining equipment, side reins, De Gouge, Chambon, training aid systems, mouth examination and bitting for the young horse, use of a mounted dummy for rider introduction.

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**EQ4027 - EQUESTRIAN FACILITIES**  
ECTS Credits: 6

**Biological Sciences**

Analysis of requirements for equine facilities with regard to; racing, sports horses, breeding, competition, exercise and training, client facilities, horse welfare and soundness, disease control, isolation and quarantine facilities. Ancillary facilities; feed stores, gallops, arenas, fixed and portable fences, dry and water treadmills, solaria, wash boxes, weighing facilities, loading bays, equipment storage, farriery and breeding areas, road and air transport environments. Planning and building requirements; materials, environmental impact, waste disposal, aesthetics. Use of ICT in equestrian establishments; staff training, monitoring horses, entries and administration, horse and client records, veterinary applications.

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**EQ4037 - PERFORMANCE RIDER DEVELOPMENT**  
ECTS Credits: 6

**Biological Sciences**

Analysis of performance demands on the rider; sports disciplines, racing (flat and National Hunt), endurance, mental and physical capacities. Characteristics of performance riders; body morphology, attitudes to training, relationships with coach and supporters, technical, tactical, physical, mental and lifestyle capacities. Analysis of rider motor and proprioceptive capacity; video analysis, appropriateness and efficiency of sport movement, common difficulties in movement patterns, developmental plans for riders in various disciplines. Developing the rider; use of technology and equipment to provide feedback and support practise, use of novel development tools, athlete diaries, athlete driven reflection and goal setting, maintaining technique and focus in stress environments - race finishes, jump offs. Models of motor skill development and use of appropriate technology and equipment to support motor skill development.

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**EQ4051 - INTRODUCTION TO HORSEMANSHIP**  
ECTS Credits: 6

**Biological Sciences**

Rationale and Purpose of the Module: The purpose of this module is provide the students with the basic understanding of horsemanship, a foundation level of knowledge and practical skill in working with the horse in a safe manner, to highest industry standards.

Syllabus: Safety around the horse in all working environments; health and safety legislation, best safety practice, individual responsibility for recognising and minimising risk, equine behavioural bases of established safety practice. Gaits and movement; analysis of basic gaits, effect of equipment and the rider on the qualitative and quantitative aspects of movement. Horse management; basic methods of management for horses stabled, at grass and at competition, simple health indicators. Tack and equipment; recognition and application of simple commonly used items, principles of design and function, physiological and psychological effect on the horse. Rider/trainer capacities; proprioception, communication, simple work from the ground and ridden, simple methodologies of horse training.

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**ER4001 - ENERGY AND THE ENVIRONMENT**  
ECTS Credits: 6

**Chemical Sciences**

Rationale and Purpose of the Module: To draw upon core scientific module of the program e.g, thermodynamics while exposing students to the local, regional & global environmental effects that arise from the generation and use of energy.

Syllabus: Energy Resources & Supply  
Thermodynamics of energy conversion  
Electricity generation & storage  
Fossil fueled power generation  
Transportation  
Clean Technology for energy generation and transmission  
Nuclear power generation
ER4011 - INTRODUCTION TO ENVIRONMENTAL & BIOSCIENCES
ECTS Credits: 3

Chemical Sciences

Rationale and Purpose of the Module: Environmental and Biosciences are broad interdisciplinary subject areas. It is important that first year students, entering through the common science intake programme, gain a useful understanding and knowledge of the scope of these subject areas to effectively ensure that they can make appropriate choices at the end of their first year in UL. This module provides an overview of the broad areas and current topics within both the bioscience and environmental science areas.

Syllabus: Sustainable development; environmental impact assessment; ecosystems and functioning: fossil fuels and the environment; water and air pollution; waste management. Topics in Biosciences include: development in cancer therapies; new immunotherapies; understanding cell communications; the human condition - us and our microbes

Prerequisites: CH4701, CH4711, CH4721, BY4001

ER4405 - CONSERVATION ECOLOGY
ECTS Credits: 6

Chemical Sciences

Rationale and Purpose of the Module: To explore the purpose of biodiversity conservation, and how expenditure of resources on conservation may be justified. To examine the concept of ÒbiodiversityÓ and explore its significance. To understand the impacts of humanity on biodiversity and possible mitigation measures. To provide a theoretical and practical understanding of ecological evaluation.

Syllabus: To review case studies in the management of conservation areas, and habitat restoration.

ER4407 - ENVIRONMENTAL MANAGEMENT 1
ECTS Credits: 6

Chemical Sciences

Rationale and Purpose of the Module: To understand the relationship between economic development and the environment: The evolution and contemporary application of the concept of environmental management. The interaction between nature, society and enterprise.

Syllabus: Biodiversity is defined, its importance to humanity explained in terms of ecosystem services and functioning. Human impacts on biodiversity under a range of categories and mitigation measures are explored. Students are required to read and explore case studies relevant to the conservation of biodiversity.

ER4438 - ENVIRONMENTAL FATE MODELING
ECTS Credits: 6

Chemical Sciences

Rationale and Purpose of the Module: To provide the student with a scientific understanding of the important principles in relation to pollutant transport and degradation in the environment.

To facilitate the student in using both computational and computerised approaches to environmental fate modelling.

To facilitate the students' understanding of the role and relevance of environmental fate modelling in the prediction of environmental impacts and human/ecological risk.

ER4507 - EFFLUENT CONTROL - WASTE MANAGEMENT
ECTS Credits: 6

Chemical Sciences

Rationale and Purpose of the Module: To provide an understanding of the principles underlying wastewater treatment.


Prerequisites: ER4507

ER4627 - Safety and Industry
ECTS Credits: 6

Chemical Sciences

Rationale and Purpose of the Module: To provide an understanding of the principles of accident causation and prevention in the workplace.

To familiarise the student with hazard and process safety analysis techniques as practised in industry.

Syllabus: Principles of accident prevention; accident causation modes, risk identification, evaluation and control, hazard reduction techniques, design out, safety devices, warning devices. Hazard analysis, HAZAN, frequency, consequence, ALARA, Fatal Accident Rate, Hazard rate. Process Safety Analysis, HAZOP, guide words, what if reports, Fault tree analysis, primary and intermediate events, gate symbols, transfer symbols, Fire & explosion Indices. Fire safety management, current legal requirements, fire hazard identification, and risk assessment, active and passive fire protection, safe operating procedures, fire training, information and communication. Selected industrial case studies.

ER4707 - MONITORING AND RESEARCH METHODS
ECTS Credits: 6

Chemical Sciences

Rationale and Purpose of the Module: To familiarise the student with the chemical and physical nature of a broad range of pollutant types which are currently of environmental concern.

To facilitate the student in understanding the nature of environmental sampling and the industrial origin of specific pollutants and associated environmental impacts.

Assessment of sampling technologies covering a range of environmental samples from a variety of media including air, soil, surface water and groundwater.

Development of the students' working knowledge of industrial and ambient monitoring techniques on a practical and quantitative basis.


[Groundwater Pollution] subsurface environment, groundwater movement, sources of pollution, point sources û diffuse sources û microbial activity.

[Pollutant transport in groundwater], non-aqueous phase liquid pollution (NAPL) û (DNAPL).


[Surface Water Pollution] emissions to water, water quality monitoring, water quality assessment.

[Atmospheric Pollution] odour, SOx, NOx & Acids, organics, temperature pressure, humidity, molar volumes, converting ppmv to mg/m3, STP/NTP - time weighted averages, dust, USEPA methods, isokinetic sampling methods

ER4708 - BIOMETRICS
ECTS Credits: 6

Biological Sciences

Rationale and Purpose of the Module: To provide a practical course in analysis of the type of data encountered in environmental science and health and safety.

Syllabus: Practicals for this module consist of a weekly two hour session on computers where the students use the following packages: Microsoft Excel, SPSS for Windows and MVSP (Multivariate Statistical Package, W. Kovach). The students learn to input ecological data and transfer it between the various packages; carry out preliminary data analysis and descriptive statistics; move on to more advanced analyses. Finally, using MVSP, the students undertake simple multivariate procedures including dendrograms and correspondence analysis.

ES4001 - EUROPEAN STUDIES: A GLOBAL PERSPECTIVE
ECTS Credits: 6

School of Modern Languages and Applied Linguistics

Rationale and Purpose of the Module: This module aims to provide an induction into third-level study for European Studies students and to mediate to new third-level learners the nature of European Studies as a combination of different academic disciplines and interdisciplinary possibilities. The module seeks to develop critical analytical skills, oral and written presentational skills and to provide new students with a critical overview of the contemporary state of their field of study. It will also have the goal of enhancing group experience and dynamic within the course with a view to maximising the educational benefit students derive from their disciplinary and linguistic studies. It will foster an awareness of the importance of autonomous learning and participatory research in the undergraduate educational experience. Finally, it will promote awareness among students of the fact that they will be working in an intercultural field and of the consequent importance of developing intercultural
Syllabus: This introductory module is organised around selected set of themes in the interdisciplinary field of European Studies. Each theme set is formulated as a question put to participants, for unpacking, development, autonomous research, and intensive, teacher-facilitated discussion. The central focus of the module will be on fostering in new entrants the skills necessary for full engagement with the European Studies degree. Topics for study may include the following: Geographical and territorial definitions of Europe. Linguistic issues in Europe. Unity and diversity of European culture. The `cultural industry in Europe. `European values, democracy and diversity as case studies. The question of a `European economic model. Citizenship in European and global contexts. The role(s) of Europe within globalisation and a wider `world system. Colonialism, its practices and its legacies. Ireland in a European and a global context.

ET4003 - ELECTRO TECHNOLOGY (ED)
ECTS Credits: 6

Electronic & Computer Engineering

Rationale and Purpose of the Module: This module provides an introduction to electrotechnology for students studying in the area of enterprise engineering, materials and construction.

The electronics content of the LM095/LM094 programmes is being expanded to meet the requirements of the impending revised leaving cert. syllabi in Technology and Engineering Technology. Replaces ET4111 Electrotech. ID

Syllabus: Electrical concepts: electric current, voltage, resistance, power. The relationship between them, units of current, voltage, resistance, power and frequency. The resistor colour code. Measurement of current, voltage, resistance, capacitance, frequency (V, A, W, F, Hz). Indirect measurement of power. The difference between AC and DC. Interpretation of circuit diagrams. Assembly of simple circuits using strip and breadboard. Passive components, resistors, capacitors, inductors, magnetic and electric field effects of charge and current. Diodes. The transistor switch. Voltage regulators, photoresistors, photodiodes, LEDs, phototransistors, variable resistors, potential dividers, potentiometers and relays. Sensors for sound, heat, light (photoreisistive and photovoltaic), movement. Electric motors, The mode of operation of the DC motor; back EMF; the variation of current requirement with the load, Reversing a DC motor. Strategies for teaching this subject area at second level. Designing, planning and managing appropriate teaching and learning activities for this subject area.

ET4008 - TEST ENGINEERING 2: DIGITAL CIRCUIT AND SYSTEM TEST
ECTS Credits: 6

Electronic & Computer Engineering

Rationale and Purpose of the Module: The increasing complexities and speed of operation of modern digital circuits and systems is increasing the demand on product testing. The purpose of the module is to introduce the students to modern semiconductor integrated circuit (IC) test methods, including automatic test equipment (ATE), design for testability (DFT) and built-in self-test (BIST) for digital ICs.

Syllabus: The increasing complexities and speed of operation of modern digital circuits and systems is increasing the demand on product testing. The module will concentrate on IC designs, with the following key areas covered:-
1. Semiconductor test overview:- test points for semiconductor devices from wafer to package.
2. Test Engineering requirements.
3. Digital logic test concepts:- sequential and combinational logic.
4. Memory test:- RAM and ROM.
5. Fault modelling and fault simulation
6. Design for Testability (DFT).
7. Built-In Self-Test (BIST).
8. Problem with design complexity: System on a Chip (SoC) test problem.
9. ATE systems.
10. IEEE Standard 1149.1 (Boundary Scan).

Prerequisites: ET4015

ET4013 - COMMUNICATIONS NETWORKING FUNDAMENTALS
ECTS Credits: 6

Electronic & Computer Engineering

Rationale and Purpose of the Module: The aim of this module is to provide an introduction to data communications and networking. The module includes an overview of essential foundation topics and also introduce students to the internetworking principles and concepts.
Syllabus: Introduction to telecommunications:
Definitions and concepts, standards bodies, communications tasks, protocol elements, characteristics and functions; reference communications models (OSI vs. TCP/IP). History/evolution of telecommunications networks. Physical Layer: Transmission modes and types; analog vs. digital signals; baseband vs. broadband; modulation/demodulation; transmission impairments (attenuation, delay distortion, noise); channel capacity; data encoding and compression; physical interfacing; asynchronous vs. synchronous transmission; transmission media (guided, unguided); structured cabling standards; multiplexing techniques (FDM, TDM, WDM). Network topologies (star, ring, bus, tree, mesh). Data link layer: Line disciplines (ENQ/ACK, poll/select); framing; frame synchronisation and data transparency, flow control; addressing; link management; protocol examples (HDLC, LAPB, LAPD, LAPM, PPP). Introduction to higher communications layers: Switching (circuit-, message-, packet-); routing (main types, concepts and principles), congestion control, QoS management, connection-oriented vs. connectionless transport services; segmentation and re-assembly; session management; data presentation; client-server model; internetworking principles and concepts (repeating, hubs, bridges, routers, gateways).

ET4017 - COMMUNICATIONS NETWORKING STANDARDS
ECTS Credits: 6

Electronic & Computer Engineering
Rationale and Purpose of the Module: The aim of this module is to provide further education in communications networks and provides detailed overview of the main international networking standards. The module also introduces students to modern communications standardised infrastructures and associated business models and paradigms.

Syllabus: Personal Area Networks (PANs): Bluetooth, IEEE 802.15 standard.
Local Area Networks (LANs): Medium Access Control (CSMA/CD vs. CSMA/CA); logical link control (LLC), IEEE standards: 802.3/u/z/ae (ethernet), 802.5 (token ring), 802.11 (WiFi), 802.1Q (VLAN).
Metropolitan Area Networks (MANs): IEEE 802.16 (WiMax) standard.
Wide Area Networks (WANs): Frame relay: Asynchronous Transfer Mode (ATM); Multi-Protocol Label Switching (MPLS); Integrated Services Digital Networks (ISDN). Broadcast audio/video carrier technologies: Terrestrial (DAM, DRM, DVB-T/DVB-H, MBMS), satellite (DVB, S-DMB, Digital Audio Radio Satellite).
Modern communications business models and paradigms: Subscriber-centric model; consumer-centric model; integrated heterogeneous networking, infrastructural elements.

ET4025 - NETWORK PROTOCOLS LABORATORY
ECTS Credits: 6

Electronic & Computer Engineering
Rationale and Purpose of the Module: The aim of this module is to offer the students a learn-by-doing approach in communications and computer networks, for a better understanding of how networking technologies, mainly network protocols, operate in practice. Using appropriate laboratory facilities (real network equipment, protocol analysis software), the students will be allowed to observe, measure and experiment various communications protocols. It provides the student with a comprehensive coverage of computer networking and their protection, with a strong practical emphasis.
At the completion of the module, students should have an understanding of the important issues in providing communications software for various types of computer networks. This includes LAN medium access protocols, WAN data link protocols and the TCP/IP protocol stack, mainly focusing on application protocols for file transfer, network management network security.

Syllabus: Introduction to layered architectures, basic concepts: open systems, layering, peer protocols, primitives and services. Reference models: telecommunications vs. computing approaches, OSI vs. TCP/IP, layers functions. Layer 2 LAN protocols: Ethernet, token ring and FDDI: basic characteristics, frame types, fields and troubleshooting tips, capture and decode frames.
WAN protocols: HDLC, frame relay, PPP; ATM: basic characteristics, frame types, fields and troubleshooting tips; capture and decode frames.
TCP/IP protocol stack: IPv4 and IPv6, TCP and UDP: functions and PDU structure, protocol analysis, debugging tips; capture and reassemble PDUs, extract data.
Client/server software used by TCP/IP protocols; design and implementation for client programs.
Network management: SNMP case study.
Network security: Using routers as firewalls, PGP case study.

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**ET4035 - COMPUTER LAW, INVESTIGATION AND ETHICS**
ECTS Credits: 6

Electronic & Computer Engineering
Overview of computer forensics technology.
Compute forensics evidence - capture and analysis.
Legal permissions and restrictions on investigations of incidents.
Collecting evidence for trial: evidence integrity, chain of custody and admissibility.
RFC 1087 - Ethics and the internet including the 10 commandments of computer ethics.
ISC2 Code of ethics.
Irish Information Society Commission Ethics and Values in a Digital Age.

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**ET4047 - EMBEDDED SOFTWARE**
ECTS Credits: 6

Electronic & Computer Engineering
Rationale and Purpose of the Module: The aim of the module is to provide an introduction to embedded processor systems and applications. The main objectives are to provide the student with an overview of the architecture of a simple microprocessor, to explain the operating principles and provide a functional understanding of assembly language.

Syllabus: Introduce a simple microprocessor architecture - Registers, buses and memory organisation and how it is used in embedded applications. Describe memory and I/O devices. Explain memory and I/O accesses.
Introduce instruction sets, addressing modes, data move instructions, arithmetic instruction, stack operation and usage, program flow control instructions, sub routines and loops.
Detail assembler directives and the program translation process. Review the build and load process for embedded application programs. Introduce simulation tools and debugging techniques. Introduce the monitor program and how to use it to test applications using target hardware.
Describe how to control/communicate with I/O devices through polling and interrupts. Interrupt service routines, interrupt priority, multiple interrupts, nesting.
Use practical programming examples to illustrate concepts.

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**ET4077 - CLOUD COMPUTING**
ECTS Credits: 6

Electronic & Computer Engineering
Rationale and Purpose of the Module: To introduce the student to Secure Cloud Computing. This is to enable them to fully understand the Cloud, its vulnerabilities and how to offset them.

Syllabus: Cloud Computing Fundamentals:
- Characteristics, Technology and Operational issues.

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**ET4087 - ELECTRICAL AUTOMATION**
ECTS Credits: 6

Electronic & Computer Engineering
Rationale and Purpose of the Module: This module provides the necessary understanding, knowledge and skills for students to design automated systems for industrial, built environment and other domains.

This module replaces modules EE4207 - Industrial Automation, ET4315 Robotics 1: Industrial Automation and EE4057/EE4067 Electronics Systems for the Built Environment 1 on the BSc Electronics, and BSc Energy degrees. The modules have significant overlap and the change is to rationalise and update the modules. The purpose of this module is to equip students with the necessary skills to design, build and install automated systems in the built environment, in industry and elsewhere.


Prerequisites: ET4224

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**ET4111 - ELECTROTECHNOLOGY ID**
ECTS Credits: 6

Electronic & Computer Engineering
Rationale and Purpose of the Module: An introduction to the overall basics of electrotechnology and electrical machines.

Syllabus: Electric charge, movement of charge as a current, conductors and insulators, what makes electrical current flow
potential difference, voltage, resistance to electric current, simple dc circuit analysis, series and parallel connection of components, capacitors and charge storage, charging capacitors
magnetic fields generated by electric current, electromagnetics.
alternating current (ac), simple ac circuits.
magnetism, magnetic flux, electro-magnetic induction.
electrical generators, transformers, rectification, direct current (dc) generators, dc motors, induction motors.
electronics, semi-conductor theory, diodes - rectification, transistors - switches/digital, amplifiers/analogue, IC's.

ET4132 - INTRODUCTION TO WEB AND DATABASE TECHNOLOGY
ECTS Credits: 6

Electronic & Computer Engineering

Rationale and Purpose of the Module: This module will introduce you to the concepts and techniques underlying the World Wide Web, such that you will gain a working knowledge of how to design and build web sites. The module will also present an introduction to relational databases and data models and manipulation.

Syllabus: Overview of the Internet and World Wide Web; standards and specifications
Web browsers, Web servers and protocols
Designing & creating Web Pages with HTML
Web programming: overview of XHTML, XML, CSS and ActiveX controls
Multimedia on the WWW including Audio, Video and graphics
Data & information: characteristics, differences and structures
Data management: simple file storage & retrieval;
Introduction to data modelling
Introduction to the concept of Database Management System (DBMS)
Introduction to Structured Query Language (SQL)

ET4203 - ANALOGUE ELECTRONICS 3
ECTS Credits: 6

Electronic & Computer Engineering

Rationale and Purpose of the Module: Introduction to structures of semiconductor devices and their use in basic amplifier circuits and systems.

Syllabus: Semiconductor materials: p-n junctions.
Basic semiconductor diode: structure and operation
Other forms of semiconductor diodes: zener diode, Light Emitting Diode, photodiode.
Use of the diode: voltage rectifiers in power supplies, LED displays.
Transistors: transistor operation.
Bipolar Junction Transistor (BJT): structure and operation of npn and pnp transistor.
Metal Oxide Semiconductor Field Effect Transistor (MOSFET): Structure and operation of nMOS and pMOS transistor.
Use of transistors in amplifiers: voltage amplifiers, amplifier class, analysis of amplifier operation.
Power semiconductor devices: thyristor and triac.
Data converters: ADC and DAC converters: architectures and operation.

Prerequisites: ET4141, ET4122

ET4244 - OUTCOME BASED LEARNING LABORATORY 2
ECTS Credits: 6

Electronic & Computer Engineering

Rationale and Purpose of the Module: In this module students will further develop skills to study, experiment and report on representative electronics based real world systems through interfacing via a PC or over communications networks. The students will apply programming skills, data management skills and theoretical and practical knowledge developed in preceding and concurrent modules in programming, databases and computer systems.

Study will be through a problem-based approach that will integrate material from elsewhere in the programme of study and look forward to future modules.

Syllabus: The module is a follow-on from the Outcome-based Learning Laboratory 1. It will further develop the concepts from the 1st year laboratory modules and will target user-oriented web based design and interactive on-line data acquisition and control, for example, write programs to use the external system to carry out specified task, e.g. temperature control, weather observation, lift control.

* Design of dynamic web based user oriented systems, top down, bottom up design.
* Extraction and display of real world data, data transmission point to point and through networks.
* Data exchange in multipoint systems
* Data manipulation and storage on a PC
* Interfacing PC to external system directly/over a network.
* Control of simple devices via active web pages
* Data display in user-friendly format, graphic displays, data on demand.

Prerequisites: ET4112

ET4253 - COMPUTER SYSTEMS ARCHITECTURE 2
ECTS Credits: 6

Electronic & Computer Engineering

Rationale and Purpose of the Module: The aim of this module is to introduce students to advanced processor architectures and processing concepts, such as RISC, pipelining, and superscalar instruction execution. Students will understand the architecture of modern motherboards, internal buses, modern external interfaces, and interactions between application software, BIOS and device drivers.

Syllabus: Pentium and later microprocessors and simple RISC and CISC concepts; Protected Mode operation and relationship to Windows operating system; P4 incorporation of RISC techniques. Architecture of a modern PC, showing memory and bus hierarchies, use of caches in memory hierarchy; Legacy of ISA bus and Real Mode; Introduction to PCI and other internal PC buses. Use of the BIOS in a PC and its relationship to application programs and the operating system; The use of device drivers in a PC; I/O standards, including USB, IEEE 1394, serial and parallel interfaces; Disk and mass storage interfaces and standards; Video and graphics standards. Role of the Motherboard in a PC; Evolution of the PC. Project Work: Write simple programs to illustrate aspects of the PC architecture, detailed study of a PC motherboard, configuration of a PC, installation of an operating system on a PC.
**Prerequisites:** ET4142

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**ET4305 - INSTRUMENTATION AND CONTROL 1**  
ECTS Credits: 6  
Electronic & Computer Engineering

**Rationale and Purpose of the Module:** This module introduces students to the fundamental principles of practical control engineering, the use and specification of instrumentation and the use of a computer to instrument control systems and processes.


**Prerequisites:** ET4224, ET4204

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**ET4345 - OPERATING SYSTEMS 2**  
ECTS Credits: 6  
Electronic & Computer Engineering

**Rationale and Purpose of the Module:** The prerequisite module, Operating Systems 1, introduces operating system concepts for uniprocessor systems. This module builds on the previous module by introducing a specific operating system, UNIX, and covering the underlying design and implementation features of the UNIX operating system. A set of laboratory exercises exposes the student to the internals of the UNIX operating system.

**Syllabus:** UNIX Overview: History, standards, shells, interfaces. UNIX architecture: Features, partition of functions and position in the layered structure.

Kernel organisation: Control flow, execution, daemons, timers, interrupts, clocks, modules.

Process Management: Process manager, system calls, task creation, blocking, wait queues, scheduling, IPC, booting.

Memory management: Virtual address space, secondary memory, shared memory, addressing, performance issues, system calls.

File management: File I/O, file access, different file systems, performance issues, system calls.

Device management: Device drivers, streams, interrupt handling, disk drive example.

Laboratory: A set of laboratory exercises based on skeleton example programs will guide the student through the internals of the UNIX operating system. The example programs will be developed in shell scripts and C/C++ programming environments.

**Prerequisites:** ET4725

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**ET4407 - ELECTRONICS AND THE ENVIRONMENT**  
ECTS Credits: 6  
Electronic & Computer Engineering

**Rationale and Purpose of the Module:** The protection of the environment in conjunction with economic growth will become one of the great challenges of the 21st century for a multitude of reasons. If the electronics industry is to sustain its growth levels of the last number of decades going forward this challenge will become foremost in the job function of its employees. This module will introduce the concepts which underpin this challenge. It seeks to inform students of the necessity of environmental awareness in the electronics industry and to introduce the means by which these environmental issues can be addressed.


3. Green materials: lead free interconnects, halogen free materials, all other materials outlined in WEEE and ROHS, packaging.
4. Sustainability, energy efficiency, alternative power supply.
5. Case studies discussing such issues as environmental challenges in the semiconductor industry, producer responsibility in the electronics industry and sustainable trade in the electronics sector of emerging economies among other topics.
6. Invited talks: Seminars by the local electronics industry on environmental challenges in their company.

**Prerequisites:** ET4355

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**ET4437 - DISTRIBUTED COMPUTING AND JAVA**  
ECTS Credits: 6  
Electronic & Computer Engineering

**Rationale and Purpose of the Module:** To introduce the student to Java and Distributed Computing including Remote Method Invocation and JavaBeans. To examine the role of Java in Distributed Systems and Web based Services including Security issues. In addition XML and advanced GUI features will be investigated.

On completion of this module the student should have an appreciation of the issues pertaining to the use of Java in a large Distributed Enterprise Environment.


**Prerequisites:** ET4725
Rationale and Purpose of the Module: This module provides an introduction to multi-tasking operating system concepts. Topics include: processes, threads, memory management and file systems. Focus is on a single processor machine. The module will include a laboratory project.

Syllabus: Operating System: Definitions, types of operating systems.

Processes: Concurrency, states, queues, scheduling, threads.

Interprocess communication and synchronisation: Mutual exclusion, race conditions, busy-waiting solutions, TSLs, semaphores, monitors, simple message passing, classical problems.

Deadlock: Conditions for deadlock and solutions.

Memory Management: Swapping, virtual memory, paging and segmentation.

File systems to support multi-tasking: Disk organisation, space management, file sharing, file protection, performance issues.


Laboratory: The students will become familiar with one operating system: UNIX or Microsoft Windows. Exercises will involve: shell scripting, system calls using C/C++, solving synchronisation problems in a concurrent programming environment.

Prerequisites: ET4253, ET4263

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EV4005 - GRASSLAND AND GRAZING MANAGEMENT
ECTS Credits: 6

Rationale and Purpose of the Module: To educate students in the principles of grazing and grassland management with particular reference to the equine industry in Ireland

Syllabus: 1. Introduction
2. Soil formation
3. Physical and chemical properties of soil
4. Soil fertility
5. Lime and pH
6. Major and minor elements in soil
7. Fertilisation in horse pastures
8. Grass growth
9. Re-seeding of pastures
10. See mixtures
11. Grazing management
12. Hay production
13. Silage production
14. Poisonous plants
15. Racing track management

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EV4023 - EQUINE HEALTH AND ENVIRONMENTAL MANAGEMENT
ECTS Credits: 6

Rationale and Purpose of the Module: The purpose of this module is to give students an understanding of the concept of 'dis-ease' as a departure from health and the multifactorial nature of disease pathogenesis. The module provides basic information on the individual components (host, disease agent and environment) and a perspective on the interactions of these components (the disease triad) in determining the outcome for the host.

Syllabus: The causes and effects of infectious and non-infectious agents on the health of the horse; the Disease Triad and the multifactorial nature of disease; overview of bacterial and viral diseases affecting the horse; environmental requirements of the stabled horse and the role of the environment as a pre-disposing factor to disease in the horse, vis a vis ventilation, temperature, dust and waste; Heat and moisture balance; Dust Control in Animal Production Buildings; Ventilation Systems; Temperature Regulation; Effects of Environment on Various Body Systems; Management of the Environment to optimise animal health.
**EV4025 - EQUINE BREEDING AND GENETICS**
*ECTS Credits: 6*

**Biological Sciences**

Basic genetics including, cells, chromosomes, genes, alleles, gametes, genotype, phenotype; mitosis; meiosis and its role in genetics, genetic recombination; distances between genes; linked genes, Gene mapping; chromosome structure; DNA; replication, transcription, translation and the genetic code; Inborn errors of metabolism; Sex limited inheritance; PCR; Mendelian genetics including recessive, dominant, X linked and polygenic inheritance. Gene interaction, codominance and incomplete dominance; epistasis; Equine coat colour loci including extension, agouti, colour diluting loci, epistatic modifiers, tobiano, overo and spotting loci, mendelian and non mendelian aspects of equine coat colour; Biological basis of sex; X chromosome inactivation; Pedigree analysis and inheritance, determination of inheritance patterns; the normal karyotype; parentage testing of horses, including blood group testing, biochemical polymorphisms, DNA testing; Abnormal chromosome number and structure; including sex chromosome abnormalities and autosomal trisomies; population genetics, The Hardy-Weinberg law, extensions to the Hardy-Weinberg law including multiple alleles and X linked genes; genotype frequencies; heritability; narrow and broad sense heritability; quantitative trait loci; genotype-environment interaction; estimated breeding values and selection; BLUP; Relationship; Inbreeding and linebreeding.

**FI4003 - FINANCE**
*ECTS Credits: 6*

**Accounting & Finance**

**Rationale and Purpose of the Module:** The course provides an introduction to corporate finance and financial theory. The aim of the course is to develop students understanding of fundamental topics in corporate finance and financial theory. The course provides students with the skills needed to engage in basic analysis of projects and financial assets.

**Syllabus:** The primary focus of this introductory course is on discounted cash flow techniques, and their application to corporate finance. This course introduces the concept of the time value of money, and the key methods of project appraisal including the net present value method, the payback period, the book rate of return, internal rate of return, profitability indices etc. the merits and demerits of each are explained. Qualitative aspects of capital budgeting and investments are also covered. The concept of market efficiency and of the link between risk and return are illustrated by reference to historical returns. Basic issues around share valuation are also discussed, and the students are introduced to derivative instruments, and how they may be used both defensively and aggressively.

**FI4007 - INVESTMENTS: ANALYSIS AND MANAGEMENT**
*ECTS Credits: 6*

**Accounting & Finance**

**Rationale and Purpose of the Module:** The module is designed to provide students with a thorough understanding of international financial investments. In particular the module will provide students with an appreciation of the investment environment and the skills and critical awareness necessary to make good investment decisions. More specifically, key material includes portfolio and capital market theory, asset valuation, investment management and behavioural aspects of investment decisions.

**Syllabus:** The topics covered include an introduction to the investment environment: equity securities, fixed income securities; the efficient market hypothesis and behavioural finance; risk and return: measures of risk and returns; Portfolio and capital market theory: dealing with uncertainty, portfolio risk and return, analysing portfolio risk, the role of diversification, modern portfolio theory; Portfolio selection: efficient portfolios and diversification; Asset Pricing Models: risk-return trade-off, capital market line, security market line, Capital Asset Pricing Model (CAPM), Arbitrage Pricing Theory (APT); Equity valuation: dividend discount models, technical analysis, the role of sentiment; Evaluation of investment performance.

**Prerequisites:** FI4003

**FI4407 - FINANCIAL INSTITUTIONS AND MARKETS**
*ECTS Credits: 6*

**Accounting & Finance**

**Rationale and Purpose of the Module:** The aim of this module is to give students an awareness and understanding of the current issues in, and key features of, the financial markets; Money Markets, Bond Markets, Foreign Exchange Markets and Derivative markets. It builds on the basic knowledge of finance obtained from the second year core module in Finance. It introduces the students to the various types of financial institutions and explores the function, typical activity and risk profile of each.

**Syllabus:** The determinants of interest rates and how interest rates affect bond valuations; primary and secondary markets; money markets; bond markets; equity/stock markets; foreign exchange markets, derivative markets; the differences between investment
Rationale and Purpose of the Module: (i) To present key issues in contemporary French society;
(ii) to enable students to develop receptive and active language skills;
(iii) to review French grammar;
(iv) to examine developments in the French language;
(v) to introduce students to the study of French literature.

Syllabus: Lectures introduce students to the study of social, historical, linguistic and literary aspects of contemporary France. Themes presented this semester are:
(i) the world of work and business in France;
(ii) representations of French modernity in film and literature;
(iii) French discourse genres. Tutorials explore these subjects and students reading and writing skills are improved through regular exercises. Oral and aural skills in French are stressed and they are developed through the discussion of a broad selection of contemporary oral and written texts from diverse media. A review of French grammar is carried out at a more advanced level.

Prerequisites: FR4142

FR4241 - FRENCH LANGUAGE, CULTURE AND SOCIETY 1
FRANCE, EUROPE AND B
ECTS Credits: 6

School of Modern Languages and Applied Linguistics

Rationale and Purpose of the Module: (i) To provide students with an introduction to major aspects of contemporary French society and culture;
(ii) to familiarise students to issues related to the evolution of the French language;
(iii) to introduce students to the study of French literature;
(iv) to give a solid grounding to a number of points of French Grammar.
(v) to enable students to develop practical language skills (oral and written).

Syllabus: Students are introduced in lectures to the study of social, historical, linguistic and literary aspects of French society and culture. Themes explored this semester are
(i) the Republican heritage
(ii) the modern short story
(iii) the history of the French language. These topics are discussed in depth in the more active setting of weekly tutorials. Oral and aural skills in French are a particular focus, and they are developed through the discussion of a broad selection of oral and written material from diverse media. An overall review of French grammar is carried out with special emphasis on French grammatical metalanguage.
FR4243 - FRENCH LANGUAGE CULTURE AND SOCIETY 3
ECTS Credits: 6

School of Modern Languages and Applied Linguistics

Rationale and Purpose of the Module: (i) To deepen students' awareness of major developments and issues in business in contemporary France; (ii) to provide students with the language skills needed to communicate and work in a French business context; (iii) to extend students' reading and analytical skills in the study of French literature; (iv) to build on students' understanding of advanced French grammar.

Syllabus: The module is devoted to the study of a selection of poems from the 1930s to the 1960s and of a francophone African novel.

Prerequisites: FR4242

FR4247 - FRENCH LANGUAGE CULTURE AND SOCIETY 5
ECTS Credits: 6

School of Modern Languages and Applied Linguistics

Rationale and Purpose of the Module: This module aims to: (i) to enable students to develop their written and oral language skills; (ii) to provide a detailed study of aspects of France in a European and global perspective; (iii) to provide an understanding of the postcolonial cultural context through a study of selected literary texts; (iv) to provide practice in translation in the context of theoretical issues in Translation Studies.

Syllabus: The module is centre on a series of lectures analysing the major issues with respect to France and wider world. Tutorials explore some of the issues raised in the lectures through close reading and discussion of relevant authentic texts. Language tutorials focus on the theory and practice of translation in two specific contexts (literature and computer science). Literary tutorials are devoted to the study of a selection of poems from the 1930s to the 1960s and of a francophone African novel.

Prerequisites: FR4246

FR4621 - FRENCH LITERATURE AND CULTURE 1: 20TH CENTURY LITERATURE
ECTS Credits: 6

School of Modern Languages and Applied Linguistics

Rationale and Purpose of the Module: To introduce students to the study of twentieth-century literature in French from a variety of critical perspectives.

Syllabus: A number of literary texts of an appropriate linguistic level and representativity in terms of period and genre will be studied in this module.

FR4627 - FRENCH LITERATURE AND CULTURE 5: INTELLECTUAL MOVEMENTS
ECTS Credits: 6

School of Modern Languages and Applied Linguistics

Rationale and Purpose of the Module: To study modern intellectual movements in France in the context of crisis and change in French society and culture in the twentieth century. To enable students to engage critically with cultural theories, and to apply such theory to their understanding and analysis of modern French texts. To develop students' skills in communicating ideas in oral and written French.

Syllabus: Two/ three topics will be chosen each year, and a variety of theoretical and literary texts will be addressed in relation to each topic, for example existentialism; structuralism/semiology; post-modernism; feminist theory.

FR4921 - FRENCH FOR BUSINESS 1A
ECTS Credits: 6

School of Modern Languages and Applied Linguistics

Rationale and Purpose of the Module: (i) To introduce students to Business French relevant to their future professional needs, (ii) to provide students with an understanding of key aspects of contemporary French society, (iii) to enable students to develop practical skills (receptive and active), (iv) to consolidate students' knowledge of French.
vocabulary and grammar.

**Syllabus:** Students are introduced to the study of social, historical, linguistic and literary aspects of French culture and society.

Themes studied in this semester are
(i) the Republican heritage
(ii) the modern short story and
(iii) the history of the French language. Oral and aural skills in French are improved through the discussion of a broad selection of contemporary oral and written texts, from diverse media. With the use of authentic material and with a variety of linguistic activities simulating a business environment students are asked to deal competently with tasks encountered in specific situations; the areas of focus include: applying for a job, job interview, working in a company. Students are also asked to do oral presentations on contemporary French society and culture. Students grammatical competence acquired in secondary school is further developed.

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**FR4923 - FRENCH FOR BUSINESS 3A**
ECTS Credits: 6

**School of Modern Languages and Applied Linguistics**

**Rationale and Purpose of the Module:**
(i) To deepen students awareness of key aspects of the contemporary French world of business;
(ii) to provide students with an understanding of key aspects of contemporary French and Francophone societies;
(iii) to further develop practical language skills (receptive and active);
(iv) to promote students critical reading of French literature;
(v) to build on the grammatical skills acquired in year 1.

**Syllabus:** Students are introduced in lectures to the study of social, historical, linguistic and literary aspects of contemporary France. Themes presented this semester are
(i) the French world of work and business,
(ii) representations of French modernity in film and literature, and
(iii) French discourse genres. Oral and aural skills in French are a particular focus, and they are developed through the discussion of a broad selection of contemporary oral and written texts from diverse media.

With the use of authentic material (both written and oral) and with a variety of linguistic activities simulating a business environment students are asked to deal competently with tasks encountered in specific situations. The areas of focus include: insurance, advertising and export. Students also study a literary text related to one of the lecture themes. The study of French grammar -in year 1- is continued.

**Prerequisites:** FR4922

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**FR4925 - FRENCH FOR BUSINESS 5A**
ECTS Credits: 6

**School of Modern Languages and Applied Linguistics**

**Rationale and Purpose of the Module:** To prepare students for study or work placement abroad taking place in semester 6. This is achieved:
by developing studentsÆ knowledge of French for Specific Purposes
by focusing on cultural aspects which will be encountered in and outside the workplace while residing in the target country
by encouraging team-work and intercultural understanding via tandem learning with French speaking students.

**Syllabus:** The French for Business 5 module provides students with a platform to broaden and advance their experience of language learning. Language and culture are interwoven through the four distinct parts of the module. In the lecture on stereotypes, students are introduced to analytic tools (semiotic analysis, stereotypes and advertising strategies, film analysis, etc.) to study particular cultures and identities. In the tutorials, translation work on Newspaper articles is undertaken together with French students making them aware of the vital link between culture and language learning. In addition, students conduct research on a French company via the Internet (company website and other Internet sources) and complete a task based Internet project. Finally, students also work on case studies related to Business issues. This last component includes writing business correspondence with a contextualised grammar revision.

**Prerequisites:** FR4924

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**FR4927 - FRENCH FOR BUSINESS 7A**
ECTS Credits: 6

**School of Modern Languages and Applied Linguistics**

**Rationale and Purpose of the Module:** While building on previously acquired reading, speaking, writing and listening skills, the course aims to enhance studentsÆ ability to engage with and express effectively ideas and concepts through the means of the target language 
-by analysing primary sources relating to institutions and policies of the EU and the place and role of France within Europe
-by giving students opportunities to practice their oral and written skills (e.g. video-viewing tasks)
-by encouraging team-work and intercultural understanding via collaborative learning with Erasmus students.

**Syllabus:** The French for Business 7 module provides students with a language rich environment to further their knowledge and increase their confidence. In the lecture, students are introduced to the main policies and institutions governing the European Union and issues regarding its unity and diversity. In the tutorials, students are taught the techniques necessary to make a detailed presentation on social or economic issues through the use of statistics, graphs and key phrases. In addition, through the study of TV documentaries and news bulletins students explore French and European societies and institutions and their role within Europe. Finally, students will study a literary text related to the module title, currently, VoltaireÆs Candide.

**Prerequisites:** FR4925

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**FT4305 - FOOD ENGINEERING PRINCIPLES**
ECTS Credits: 6

**Biological Sciences**
**Rationale and Purpose of the Module:** To provide students with an understanding of the basic engineering principles underpinning the processing of foods. To provide students with a understanding of the basic principles of heat and mass transfer as applied to food engineering.


Prerequisites: PH4022

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**FT4355 - ADVANCED NUTRIENT METABOLISM AND HEALTH**

ECTS Credits: 6

**Biological Sciences**

**Rationale and Purpose of the Module:** To provide students with an understanding of the basic engineering principles underpinning the processing of foods. To provide students with a understanding of the basic principles of heat and mass transfer as applied to food engineering.

**Syllabus:** 1. Overview of energy metabolism for the whole body including carbohydrate, protein and lipid metabolism. 2. Interplay between various metabolic regulatory systems (metabolic and hormonal) and adaption to various metabolic demands (starvation, overfeeding etc.) 3. The importance of physical activity in energy expenditure and the thermic effects of food. 4. Metabolism of selected nutrients and dietary bioactive components in relation to health (including fat- and water-soluble vitamins, essential fatty acids, phytochemicals, prebiotics). 5. Overview of nutritional strategies to manage disease conditions.

Prerequisites: BY4214

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**FT4375 - FOOD PROCESSING OPERATIONS**

ECTS Credits: 6

**Biological Sciences**

**Rationale and Purpose of the Module:** To provide students with a direct link between the theoretical aspects of different food processing operations with the practical aspects of processing of specific consumer foods

**Syllabus:** A detailed overview of the major unit operations used to convert raw materials into foods merged with specific practical sessions on dairy processing, such as in the manufacture of cheese and yoghurt. Basic principles of evaporation, spray drying, refrigeration, freeze drying, membrane separation technologies (ultrafiltration, microfiltration, reverse osmosis, electro dialysis), canning, freezing and irradiation. Basic principles of mechanical and phase separations. Microbiological, chemical and physical effects of processing on foods. Practical examples of the application of different unit operations in the manufacture of safe and nutritious consumer foods such as cheese, yoghurt and emulsified food products.

Prerequisites: FT4204

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**FT4421 - INTRODUCTORY FOOD SCIENCE AND HEALTH**

ECTS Credits: 6

**Biological Sciences**

**Rationale and Purpose of the Module:** To provide an introductory course in food science and technology, highlighting the linkages between food and health. To highlight factors affecting food quality, safety and nutrition

**Syllabus:** General overview of Food Science and its relationship to human health. Brief introduction to basic food components. Introduction to the scientific principles underpinning food production, preservation and packaging. Control systems to ensure food safety and quality e.g. Hazard Analysis Critical Control Point (HACCP). Impact of food processing technologies on health and nutrition, safety and quality. Introduction to the chemistry of nutritional and anti-nutritional components relevant to human health e.g. Malliard-browning reactions, protein degradation, lipid oxidation. Food and health issues of consumer concern including bovine spongiform encephalitis (BSE), genetically modified foods, E. coli 0157:H7.

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**FT4437 - MILK PROTEINS AS FOOD INGREDIENTS**

ECTS Credits: 6

**Biological Sciences**

**Rationale and Purpose of the Module:** To provide students with an understanding of the basic engineering principles underpinning the processing of foods. To provide students with a understanding of the basic principles of heat and mass transfer as applied to food engineering.

**Syllabus:** Introduction to the chemistry of nutritional and anti-nutritional components relevant to human health e.g. Malliard-browning reactions, protein degradation, lipid oxidation. Food and health issues of consumer concern including bovine spongiform encephalitis (BSE), genetically modified foods, E. coli 0157:H7.
Rationale and Purpose of the Module: To provide students with an advanced understanding of the role of milk proteins as food ingredients.


FT4447 - FOOD QUALITY
ECTS Credits: 3

Biological Sciences

Rationale and Purpose of the Module: To provide a comprehensive course on food quality and safety. To develop an understanding of the physical, molecular, and microbiological basis of food quality.


Prerequisites: FT4204, FT4325

FT4457 - RESEARCH TRENDS IN HEALTH AND FOOD
ECTS Credits: 3

Biological Sciences

Rationale and Purpose of the Module: To develop a high standard of competence in the acquisition and evaluation of scientific research information. To enable students develop a critical awareness of emerging research in the field of food science and health.

Syllabus: Using specific examples, students will be trained how to critically evaluate research information. Students will be made aware of the requirements in technical writing and presentation skills. Demonstration of advanced information retrieval using the web of science and other abstracting services. Individual students will be assigned topics on emerging issues in food science and health research. Students will be required to write scientific reports and give presentations on their findings. Representative areas and specific topics include:

- Food quality and safety (acrylamide, dioxins, genetically modified foods, organic foods)
- Novel food processing (ultrasonic and high pressure processing)
- Diet and health (cardiovascular disease, diabetes, the immune system, cancer, dieting and health)
- Food toxicology and allergenicity (novel food ingredients, food protein allergenicity)
- Neutraceuticals (Hypotensive peptides, peptides and cognitive function)
- Neutrogenomics (Diet and gene interactions)

Prerequisites: FT4335

GA4011 - CELTIC CIVILISATION: CULTURE, LANGUAGE AND REPRESENTATIONS
ECTS Credits: 6

School of Culture and Communication

Rationale and Purpose of the Module: To introduce students from various disciplines (e.g. anthropology, comparative religion, ethnology, history, literature, sociology, etc.) to the area of folkloristics and to the study of Irish folklore

Syllabus: An introduction to Irish folklore with special reference to the following areas: definitions of folklore, folklore collection and classification; verbal arts and minor genres; story-telling and narrative genres; indigenous and international tale-types in Ireland; and traditional custom and belief, including calendar customs

Prerequisites: GA4105

GA4115 - IRISH LANGUAGE 1
ECTS Credits: 6

School of Culture and Communication

Rationale and Purpose of the Module: The course aims to provide the student with a strong basic knowledge of Irish. It introduces students to the history of the Irish language and to early Irish literature. The course is designed to:

- Enable the student to understand and use basic structures of Irish grammar.
- Expose the student to a range of vocabulary and expressions which will allow her/him to present her/himself to, and communicate with Irish speakers.
- To foster autonomous language learning skills.
- To develop listening and speaking skills in Irish.
- To equip the student with basic writing skills.

Syllabus: Language element: This is an introductory course. Topics covered include: Meeting people, background and place of residence, the family, the house and accommodation, pastimes, daily life and talents and skills. Gaeltacht regions and certain dialect features will be discussed and some of the many Irish-language materials
and resources available online will be explored.

Note: The language syllabus of this course has been developed by NUI-Maynooth and follows the guidelines established by the Council of Europe/ES Common European Framework of Reference for Languages. Those who continue with module GA4116 in the spring semester will gain enough practice with the language to sit the A1 level European Certificate in Irish, known as Teastas Eorpach na Gaeilge. The certificate examination is completely voluntary and is not administered by the University of Limerick, but does give the student an internationally recognized qualification in Irish. Please consult an academic tutor if you would like more details.

Lectures / Léachtaí: Lectures will cover the history of the Irish language and early Irish literature. Topics include the genetic relationship between Irish and other European languages, particularly other Celtic ones, and trace the development of the language from its primitive ancestral to Old, Middle, and Early Modern Irish. A survey of early Irish literature will include selected stories from the Mythological, Ulster, and Fenian Cycles with analysis of predominant themes and symbolism.

ECTS Credits: 6

School of Culture and Communication

Rationale and Purpose of the Module: Go bhforbrófai teagmháil an mhic léinn le litríocht na Gaeilge dáchais; go léifeadh an mac léinn na mórshaothair litríochta a scriobh údair de chuid na Gaeilteachta, agus go gcruíheadh sé aithne ar litríocht chomhaismearta na gceantar eagsúil seo idir phrós, dhírbheathaisnéisí, filíocht, amhráinalacht agus abhráighliathacht eile.

Syllabus: Saothair roghnaithe de chuid na litríochta comhaítheachta a scriobhadh sa Ghaeltacht, nó a scriobh údair na Gaeilteachta; prós, filíocht, aistí ar chúrsaí naÓg, spóirt agus araile; díreach na Gaeilteachta sa gceantar a bhí átithe ann. Léirítear agus fhorbrótae a chuid na Gaeilteachta, le haghaidh an mhic léinn ar shaol na nGael ón 17ú go dtí an 19ú hAois, agus ar shaibhreas na Gaeilge i Meiriceá Thuaidh agus sa Bhreatain.

ECTS Credits: 6

School of Culture and Communication

Rationale and Purpose of the Module: Go dtiocfadh na mic léinn ar thuiscint ar gnéithe de shaol Gaeilteachta, atá leanbh a bhí ina gceann de na Gaeilteachta, agus an Ghaeilge a scríobhadh. Dátheangachas, an débhéasc na nádúrtha a chur is fearr fós sa teanga.

Syllabus: Ranganna teagaisc: Dianchúrsa feabhais i léamh, i scriobh agus i labhairt na Gaeilge le clann Chluain na Gaeilteachta, le haghaidh an mhic léinn aonair ar chupsísháile, filíocht, amhráin, aonair, ar shaol na nGael ón 17ú go dtí an 19ú hAois, agus ar shaibhreas na Gaeilge i Meiriceá Thuaidh agus sa Bhreatain.

ECTS Credits: 6

School of Culture and Communication

Rationale and Purpose of the Module: Go bhforbrófai teagmháil an mhic léinn le litríocht na Gaeilge dáchais; go léifeadh an mac léinn na mórshaothair litríochta a scriobh údair de chuid na Gaeilteachta, agus go gcruíheadh sé aithne ar litríocht chomhaismearta na gceantar eagsúil seo idir phrós, dhírbheathaisnéisí, filíocht, amhráinalacht agus abhráighliathacht eile.

Syllabus: Saothair roghnaithe de chuid na litríochta comhaítheachta a scriobhadh sa Ghaeltacht, nó a scriobh údair na Gaeilteachta; prós, filíocht, aistí ar chúrsaí naÓg, spóirt agus araile; díreach na Gaeilteachta sa gceantar a bhí átithe ann. Léirítear agus fhorbrótae a chuid na Gaeilteachta, le haghaidh an mhic léinn ar shaol na nGael ón 17ú go dtí an 19ú hAois, agus ar shaibhreas na Gaeilge i Meiriceá Thuaidh agus sa Bhreatain.

ECTS Credits: 6
GA4153 - LITRÍOCHT AGUS SÁIÓCHT 1250-1690
ECTS Credits: 6
School of Culture and Communication
Rationale and Purpose of the Module: To gothóifí teagmháil bhreise le réimse níos sine de litríocht agus de shaloicht na Gaeilge; go gcúirsear an mac léinn ar an eolas faoi idireacht na luath-Ghaeilge; go ndéanfadh an mac léinn stáitsear ar litríocht na mban, agus iníochadh ar íomhá agus ar ionad na mban sa litríocht; go mbheadh eolas an mac léinn ar na dánta agus ar na hamhráin gháí agus faoi thionchar an amour courtois ar an nGaeilge.
Syllabus: Lorg na luath-Ghaeilge ar an teanga chomhailseartha; comhthéacs stairiúil agus sóisialta na litríochta Gaeilge a scriobhadh idir 1250 agus 1700. An amour courtois i litríocht na Gaeilge; na dánta agus na hamhráin gháí; Caoineadh Aith Uí Laoghaire; litríocht na mban agus íomhá na mná sa litríocht.

GA4163 - BEGINNERS IRISH 3
ECTS Credits: 6
School of Culture and Communication
Rationale and Purpose of the Module: To encourage transfer of oral and written communicative skills to a wider range of situations. To consolidate and revise the grammar, pronunciation and communicative skills acquired in the first two semesters. Students will progress to a level suitable to undertake a coop placement in Irish and join students who have successfully completed modules Teanga, Sochaí agus Salocht 1-3, in Semester 6.
Syllabus: The language course will address some of the A2 level European Certificate in Irish, Teastas Eorpach na Gaeilge topics. Course materials developed by NUI-Maynooth, following guidelines established by the Council of Europes Common European Framework of Reference for Languages will be used. More complex grammatical structures will be introduced. The following specific topics will be covered: social occasions, the family, pastimes, daily travel, work, talking about the weekend, food and drink and health and illness. The lecture hour will deal with current issues in Irish language and society.

GE4141 - GERMAN LANGUAGE AND SOCIETY 1: INTRO GERMAN STUD 1
ECTS Credits: 6
School of Modern Languages and Applied Linguistics
Rationale and Purpose of the Module: To introduce students to the academic study of the German language, its historical, social and structural dimensions as well as into language learning strategies and resources. To provide students with an introduction to the German-speaking countries as physical, cultural and political entities with a focus on the first half of the twentieth century. To introduce students to the analysis of literary texts in German. To consolidate linguistic knowledge (written and oral) gained at school.
Syllabus: Lecture: The German language, its history and relationship with other languages; political geography of the German-speaking countries; sociocultural and historical background to the German-speaking countries of Europe in the 19th and early 20th century. Tutorials: a) reading of literary texts to provide further access to the period while at the same time introducing reading techniques, principles of textual analysis and text discussion in oral and written form; b) contrastive grammar work: grammatical categories and terminology, English/German translation exercises, grammar in use/communicative grammar. Language laboratory: exercises in pronunciation, listening comprehension and grammar utilizing CALL facilities.

GE4143 - GERMAN LANGUAGE AND SOCIETY 3: LIVING AND WORKING GER
ECTS Credits: 6
School of Modern Languages and Applied Linguistics
Rationale and Purpose of the Module: Linguistic and cultural preparation for Co-op or SOCRATES placements in a German-speaking environment. To explain the German educational system, structures in a German company and in the world of trade and business in general patterns of everyday life. To develop students' skills in the analysis of more complex literary texts in German. To provide students with the skills to do a presentation in the foreign language. To further consolidate grammatical structures, extend vocabulary and increase accuracy in oral and written German.
Syllabus: Lecture: education environment: the educational system, universities and university life, work environment: vocational education, industrial relations, company structures, trade unions; Germany as a multicultural country; intercultural communication theory; the media landscape in Germany. Tutorials: a) discussion of authentic text material and a literary text to support the lecture; focus on the development of writing skills and cultural awareness; b) grammar in context. Language laboratory: CALL exercises; language-related exercises based on German TV programmes dealing with the issues covered in the lecture.

GE4147 - GERMAN LANGUAGE AND SOCIETY 5:GERMANY EUROPE AND BEYOND
ECTS Credits: 6
School of Modern Languages and Applied Linguistics
Rationale and Purpose of the Module: To examine Germany's role in present day Europe and explore the interrelatedness of German social and cultural developments with those of its neighbours. To develop inter-cultural awareness and communication skills. To continue the study of more complex literary texts in German. To develop translation skills and enhance students' presentation skills in the foreign language.
Syllabus: Lecture: Germany and its neighbours; Germany and the Third World; German economic and cultural activities abroad; national images and their origins; the image of Germany abroad and the German
self-image; German/Irish relations. Tutorials: a) discussion of texts connected with the lecture; contrastive cultural studies including students’ presentations in the foreign language; b. grammatical exercises c) graded translation exercises focussing on German/English translations.

Prerequisites: GE4146

GE4211 - GERMAN FOR BEGINNERS 1  
ECTS Credits: 6

School of Modern Languages and Applied Linguistics

Rationale and Purpose of the Module: To provide students with an introduction to the German-speaking countries as physical, cultural and political entities; To give an overview of the major social and cultural developments in the German-speaking countries of Europe in the 19th and early 20th century. To introduce students to the academic study of the German language, its historical, social and structural dimensions.

To provide communicative skills (listening, speaking, reading, writing) at a basic level in German through the introduction and practice of simple grammatical structures, functions and vocabulary.

To introduce students to autonomous language-learning methods.

Syllabus: Lecture: The German language, its history and relationship with other languages; political geography of the German-speaking countries of Europe in the 19th and early 20th century.

Tutorials: Working with the set textbook, back-up audio-visual and online materials, students are introduced to the concepts of gender, number and case and to the basic structures of the German language. Students are also made aware of approaches to language learning, including developments of autonomous learning skills, exploitation of reference material and dictionaries, etc.

Language Laboratory: Consolidation is provided through ICT and language laboratory work, and students are expected to make full use of all laboratory facilities in their private language study.

GE4213 - GERMAN FOR BEGINNERS 3 (APPLIED LANGUAGES)  
ECTS Credits: 6

School of Modern Languages and Applied Linguistics

Rationale and Purpose of the Module: This module completes students’ basic language study. It aims to increase students’E confidence in writing and speaking German and to both promote intercultural awareness and provide linguistic and cultural preparation for study/work in a German-speaking environment.

Syllabus: Lecture: Education environment: the educational system, universities and university life; Work environment: vocational education, industrial relations, company structures, trade unions; Germany as a multicultural country; Intercultural communication theory; the media landscape in Germany.

Tutorials: Students complete their grounding in the basic structures and vocabulary of the German language, focusing particularly on grammar and lexis in context. Students are encouraged to consolidate the skills they have acquired in earlier modules, focusing particularly on the development of speaking and writing skills and cultural awareness.

Work is supplemented by short authentic texts on contemporary issues in German-speaking countries. One hour a week is devoted to studying short literary texts, one to prepare students for living and working/studying in a German-speaking environment (application letters, cvs, practice of short interview situations, using the telephone, etc.)

Language Laboratory: CALL exercises; language related exercises based on German TV programmes dealing with the issues covered in the lecture.

Prerequisites: GE4212

GE4243 - GERMAN LANGUAGE CULTURE AND SOCIETY 3  
ECTS Credits: 6

School of Modern Languages and Applied Linguistics

Rationale and Purpose of the Module: To provide students with an introduction to German-speaking countries as physical, cultural and political entities; to develop communicative skills by revising and consolidating basic structures and vocabulary; to introduce autonomous language learning methods. Emphasis in modules GE4241 and GE4242 is placed on establishing a solid foundation in the language; by the end of Year 1, students are expected to use all basic grammatical structures with a high degree of fluency and correctness.

Syllabus: Lecture: The German language, its history and relationship with other languages; political geography of the German-speaking countries of Europe in the 19th and early 20th century. Tutorial work: Grammar/translation: introduction to basic grammatical categories and terminology; consolidation of existing grammatical knowledge and expansion into more complex structures; contrastive work by means of English/German translation exercises; Text analysis & production: principles of textual analysis and text discussion (literary and non-literary); grammar in use/communicative grammar.

Laboratory: 1 hour per week in the CALL/language laboratory will support grammar and oral work.

GE4241 - GERMAN LANGUAGE, CULTURE AND SOCIETY 1  
ECTS Credits: 6

School of Modern Languages and Applied Linguistics

Rationale and Purpose of the Module: To promote intercultural awareness and provide linguistic and cultural preparation for study/work in a German-speaking environment. To enable students to acquire the necessary linguistic and cultural skills so that they may communicate effectively in a German-speaking work environment. To continue to provide an insight into socio-economic, cultural and political structures in Germany with a special emphasis on the educational system and employment sector.

Syllabus: Lecture: education environment: the educational system, universities and university life, work
School of Modern Languages and Applied Linguistics

Rationale and Purpose of the Module: To examine Germany’s role within Europe and beyond and explore points of contact between Ireland and Germany; to continue improvement of text analysis and oral, reading and writing skills, to revise further problem areas in German grammar and increase students’ confidence in using more complex grammatical and syntactic structures. To continue the systematic study of translation theory and practice, introducing students to a range of text-types and registers.

Syllabus: Lecture: Germany and its neighbours; Germany and the Third World; German economic and cultural activities abroad; national images and their origins; the image of Germany abroad and the German self-image; German/Irish relations.

Tutorial work: Oral presentation & discussion class: drawing on text and audio materials to develop language skills and to improve general linguistic competency in German. To provide an insight into existing language skills and to improve general linguistic competency in German. To examine the role of literature in political change, the writer as social critic and women’s writing.

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GE4427 - GERMAN LANGUAGE CULTURE AND SOCIETY 5
ECTS Credits: 6

School of Modern Languages and Applied Linguistics

Rationale and Purpose of the Module: To examine Germany’s role within Europe and beyond and explore points of contact between Ireland and Germany; to continue improvement of text analysis and oral, reading and writing skills, to revise further problem areas in German grammar and increase students’ confidence in using more complex grammatical and syntactic structures. To continue the systematic study of translation theory and practice, introducing students to a range of text-types and registers.

Syllabus: Lecture: Germany and its neighbours; Germany and the Third World; German economic and cultural activities abroad; national images and their origins; the image of Germany abroad and the German self-image; German/Irish relations.

Tutorial work: Oral presentation & discussion class: drawing on text and audio-visual materials to develop formal oral skills (analysing tone & register; reporting and commentary); Text analysis & production; contemporary literature; Translation theory and practice: scientific, economic and journalistic texts.

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GE4621 - GERMAN LITERATURE AND CULTURE 1: INTRODUCTION TO GERMAN LITERATURE
ECTS Credits: 6

School of Modern Languages and Applied Linguistics

Rationale and Purpose of the Module: To give an overview over the different ways of approaching a literary text, the different genres and text types, defining their characteristics. To introduce students to the major periods and movements in the history of German literature focusing on its interrelatedness with other European literatures in conjunction with the general lecture (to be continued in the Spring Semester). To develop students’ analytic and interpretative skills.


Tutorial work: Oral presentation & discussion class: self-critical activities abroad; national images and their role within Europe and beyond and explore points of contact between Ireland and Germany; to continue improvement of text analysis and oral, reading and writing skills, to revise further problem areas in German grammar and increase students’ confidence in using more complex grammatical and syntactic structures. To continue the systematic study of translation theory and practice, introducing students to a range of text-types and registers.

School of Modern Languages and Applied Linguistics

Rationale and Purpose of the Module: To examine Germany’s role within Europe and beyond and explore points of contact between Ireland and Germany; to continue improvement of text analysis and oral, reading and writing skills, to revise further problem areas in German grammar and increase students’ confidence in using more complex grammatical and syntactic structures. To continue the systematic study of translation theory and practice, introducing students to a range of text-types and registers.

Syllabus: Lecture: Germany and its neighbours; Germany and the Third World; German economic and cultural activities abroad; national images and their origins; the image of Germany abroad and the German self-image; German/Irish relations.

Tutorial work: Oral presentation & discussion class: drawing on text and audio-visual materials to develop formal oral skills (analysing tone & register; reporting and commentary); Text analysis & production; contemporary literature; Translation theory and practice: scientific, economic and journalistic texts.

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GE4623 - GERMAN LITERATURE AND CULTURE 3: ROMANTICISM
ECTS Credits: 6

School of Modern Languages and Applied Linguistics

Rationale and Purpose of the Module: To give students an insight into German Romanticism as a literary and artistic movement, placing it in a European framework and focusing in particular on its socio-historical background. To examine the legacy of Romanticism in the 19th and 20th centuries. To further improve students linguistic skills, in particular those needed for dealing with literary texts.

Syllabus: Lecture: critique of the enlightenment; the preromantics (Sturm und Drang); romanticism in Europe; romanticism in art and literature; political romanticism, particularism and nationalism; Young Germany, Vormärz, 1848; the legacy of romanticism in the 20th century. Tutorials: discussion and analysis of selected writers of the romantic era including Novalis, E. T. A. Hoffmann, Eichendorff, de la Motte-Fouquê, Heine and women writers like Bettina von Arnim, Rahel Varnhagen and Dorothea Schlegel. Study of romantic paintings (C. D. Friedrich, P. O. Runge), also of German fairy tales as products of Romanticism.

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GE4627 - GERMAN LITERATURE AND CULTURE 5: ASPECTS OF 20TH CENTURY LITERATURE
ECTS Credits: 6

School of Modern Languages and Applied Linguistics

Rationale and Purpose of the Module: To examine aspects of 20th century writing in German through close study of individual texts.

Syllabus: The works covered in this module may be drawn from the Expressionist Movement, Weimar and exile literature, and post-war writing. Aspects which may be considered include literature and cultural identity, the role of literature in political change, the writer as social critic and women’s writing.

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GE4921 - GERMAN FOR BUSINESS 1A
ECTS Credits: 6

School of Modern Languages and Applied Linguistics

Rationale and Purpose of the Module: To consolidate existing language skills and to improve general competency in German. To provide an insight into socio-economic and political structures in Germany, Austria and Switzerland and to familiarise students with culture and history of the German-speaking countries. To introduce students to learning strategies and multimedia facilities in language learning.

Syllabus: Lecture: The German language, its history and relationship with other languages; political geography of the German-speaking countries; sociocultural and historical background to the German-speaking countries of Europe in the 19th and early 20th century.

Tutorial work: Oral presentation & discussion class: self-critical activities abroad; national images and their role within Europe and beyond and explore points of contact between Ireland and Germany; to continue improvement of text analysis and oral, reading and writing skills, to revise further problem areas in German grammar and increase students’ confidence in using more complex grammatical and syntactic structures. To continue the systematic study of translation theory and practice, introducing students to a range of text-types and registers.

School of Modern Languages and Applied Linguistics

Rationale and Purpose of the Module: To examine Germany’s role within Europe and beyond and explore points of contact between Ireland and Germany; to continue improvement of text analysis and oral, reading and writing skills, to revise further problem areas in German grammar and increase students’ confidence in using more complex grammatical and syntactic structures. To continue the systematic study of translation theory and practice, introducing students to a range of text-types and registers.

Syllabus: Lecture: Germany and its neighbours; Germany and the Third World; German economic and cultural activities abroad; national images and their origins; the image of Germany abroad and the German self-image; German/Irish relations.

Tutorial work: Oral presentation & discussion class: drawing on text and audio-visual materials to develop formal oral skills (analysing tone & register; reporting and commentary); Text analysis & production; contemporary literature; Translation theory and practice: scientific, economic and journalistic texts.

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SPECTS OF 20TH CENTURY LITERATURE
ECTS Credits: 6

School of Modern Languages and Applied Linguistics

Rationale and Purpose of the Module: To give students an insight into German Romanticism as a literary and artistic movement, placing it in a European framework and focusing in particular on its socio-historical background. To examine the legacy of Romanticism in the 19th and 20th centuries. To further improve students linguistic skills, in particular those needed for dealing with literary texts.

Syllabus: Lecture: critique of the enlightenment; the preromantics (Sturm und Drang); romanticism in Europe; romanticism in art and literature; political romanticism, particularism and nationalism; Young Germany, Vormärz, 1848; the legacy of romanticism in the 20th century. Tutorials: discussion and analysis of selected writers of the romantic era including Novalis, E. T. A. Hoffmann, Eichendorff, de la Motte-Fouquê, Heine and women writers like Bettina von Arnim, Rahel Varnhagen and Dorothea Schlegel. Study of romantic paintings (C. D. Friedrich, P. O. Runge), also of German fairy tales as products of Romanticism.

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SPECTS OF 20TH CENTURY LITERATURE
ECTS Credits: 6

School of Modern Languages and Applied Linguistics

Rationale and Purpose of the Module: To examine aspects of 20th century writing in German through close study of individual texts.

Syllabus: The works covered in this module may be drawn from the Expressionist Movement, Weimar and exile literature, and post-war writing. Aspects which may be considered include literature and cultural identity, the role of literature in political change, the writer as social critic and women’s writing.

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SPECTS OF 20TH CENTURY LITERATURE
ECTS Credits: 6

School of Modern Languages and Applied Linguistics

Rationale and Purpose of the Module: To examine aspects of 20th century writing in German through close study of individual texts.

Syllabus: The works covered in this module may be drawn from the Expressionist Movement, Weimar and exile literature, and post-war writing. Aspects which may be considered include literature and cultural identity, the role of literature in political change, the writer as social critic and women’s writing.

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SPECTS OF 20TH CENTURY LITERATURE
ECTS Credits: 6

School of Modern Languages and Applied Linguistics

Rationale and Purpose of the Module: To examine aspects of 20th century writing in German through close study of individual texts.

Syllabus: The works covered in this module may be drawn from the Expressionist Movement, Weimar and exile literature, and post-war writing. Aspects which may be considered include literature and cultural identity, the role of literature in political change, the writer as social critic and women’s writing.

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SPECTS OF 20TH CENTURY LITERATURE
ECTS Credits: 6

School of Modern Languages and Applied Linguistics

Rationale and Purpose of the Module: To examine aspects of 20th century writing in German through close study of individual texts.

Syllabus: The works covered in this module may be drawn from the Expressionist Movement, Weimar and exile literature, and post-war writing. Aspects which may be considered include literature and cultural identity, the role of literature in political change, the writer as social critic and women’s writing.
**GE4923 - GERMAN FOR BUSINESS 3A**  
ECTS Credits: 6  

**School of Modern Languages and Applied Linguistics**  

**Rationale and Purpose of the Module:** To enable students to acquire the necessary linguistic and cultural skills so that they may communicate effectively in a German-speaking work environment. To continue to provide an insight into socio-economic, cultural and political structures in Germany with a special emphasis on the educational system and employment sector. To develop awareness of German companies in Ireland/Irish companies in Germany. To introduce issues in intercultural communication (German/Irish).

**Syllabus:** Lecture: education environment: the educational system, universities and university life, work environment: vocational education, industrial relations, company structures, trade unions; Germany as a multicultural country; intercultural communication theory; the media landscape in Germany.

Tutorial: a) discussion of authentic text material and a literary text to support the lecture; focus on the development of writing skills and cultural awareness; b)

**Prerequisites:** GE4922

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**GE4925 - GERMAN FOR BUSINESS 5A**  
ECTS Credits: 6  

**School of Modern Languages and Applied Linguistics**  

**Rationale and Purpose of the Module:** To provide a general introduction to researching business subject matters in German. To consolidate existing language skills and familiarisation with the language of marketing, economics, human resources, insurance and accounting. To prepare students for Cooperative Education.

**Syllabus:** Lecture: Focus on the different specialisations within business studies chosen by the students; introduction to key principles of marketing, economics, human resources, insurance and accounting in German with presentations

Tutorial: a) consolidation of topics discussed in lecture; b) discussion of authentic text material to support the lecture c) strengthening of complex grammatical structures

**Prerequisites:** GE4924

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**GE4927 - GERMAN FOR BUSINESS 7A**  
ECTS Credits: 6  

**School of Modern Languages and Applied Linguistics**  

**Rationale and Purpose of the Module:** To examine Germany's role in present day Europe and explore the interrelatedness of German social and cultural developments with those of its neighbours. To develop inter-cultural awareness and communication skills, especially in a business cocontext. To develop translation skills and enhance students' presentation skills in the foreign language. To expand on knowledge and skills acquired during Cooperative Education.

**Syllabus:** Lecture: Germany and its neighbours; Germany and the Third World; German economic and cultural activities abroad; national images and their origins; the image of Germany abroad and the German self-image; German/Irish relations.  

Tutorial: a) discussion of texts connected with the lecture; contrastive cultural studies including students' presentations in the foreign language; b) business text analysis and production, consolidation of language skills in a range of registers c) translation theory and practice, focussing on German/English scientific, economic and journalistic texts.

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**HI4007 - HISTORIOGRAPHY**  
ECTS Credits: 6  

**History**  

**Rationale and Purpose of the Module:** This module will aim to provoke students into thinking about history in analytically new and creative ways, through introducing them to alternative historiographical approaches for understanding the past. Issues of objectivity/analytical new and creative ways, through introducing them to alternative historiographical approaches for understanding the past. Issues of objectivity/analytical new and creative ways, through introducing them to alternative historiographical approaches for understanding the past. Issues of objectivity/analytical new and creative ways, through introducing them to alternative historiographical approaches for understanding the past. Issues of objectivity/analytical new and creative ways, through introducing them to alternative historiographical approaches for understanding the past. Issues of objectivity/analytical new and creative ways, through introducing them to alternative historiographical approaches for understanding the past. Issues of objectivity/analytical new and creative ways, through introducing them to alternative historiographical approaches for understanding the past. Issues of objectivity/analytical new and creative ways, through introducing them to alternative historiographical approaches for understanding the past.

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**HI4043 - EUROPE: ENLIGHTENMENT AND REVOLUTION 1688 - 1815**  
ECTS Credits: 6  

**History**  

**Rationale and Purpose of the Module:** The aim of this second-year module is to provide an overview of British and European History in the eighteenth and early nineteenth centuries. The period will be examined from two angles: (1.) chronologically, so that students will attain a grasp of the progression of events from the death of Louis XIV and the partition of the Spanish Monarchy, through the European revolutions of the late eighteenth century to the rise of the modern nation states in the nineteenth century; and (2.) thematically, where we will be examining different aspects that were characteristic of the period in question, such as the Scientific Revolution and the Enlightenment; liberalism and nationalism; industrialisation and the emerging role of mass movements. By the end of the module, students will have
improved their skills of analysis and written expression, and they will have acquired a critical perception of how modern Europe was born from the rubble of the Old Regime.

**Syllabus:** The decline of belief in witchcraft and the scientific revolution; the emergence of Russia as the leading power in eastern Europe; Europe at peace, 1715-1740; the expansion of Britain as a world power; the Enlightenment and its impact on economy, society and politics; the Enlightened absolutists: Joseph II and Catherine the Great; Spain in the eighteenth century; the rise of Prussia and the diplomatic revolution of 1756; the role of women at the court of Louis XV; the collapse of the Old Regime in the 1780s; the French revolution; European radicalism in Britain, Poland and the Low Countries; Napoleonic Europe; the Congress of Vienna and the balance of power in the early nineteenth century; reaction, conservatism and romanticism, 1815-1830; social and parliamentary reform in Britain and France after 1815; Austria in the age of Metternich; the revolutions of 1848.

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**HI4053 - IRELAND: 1750 - 1850**

**ECTS Credits:** 6

**History**

**Rationale and Purpose of the Module:** The aim of this module is to provide an introduction to Ireland during the period 1750-1850 in three interrelated sections: economies, societies and cultures, political and civil societies.

**Syllabus:** I ENVIRONMENTS AND ECONOMIES

1 wind, rain, soil
2 time and place
3 diet: cattle, grain, roots
4 regional ecologies, economies and cultures
5 growth and crisis; land, wages, prices, trade
6 demographic transitions: births, deaths, migrations
7 infrastructures
8 the 1850 economy

II SOCIETIES AND CULTURES

1 rural social structures: landownership, farming, labour
2 the cult of improvement
3 household; gender, sexuality and patriarchy:
4 urban society: merchants, trades, mendicants
5 the languages of Ireland: Anglicisation 1750-1850
6 belief and faith

III POLITICAL AND CIVIL LIFE

1 the constitution: king, lords and commons of Ireland
2 constituencies and franchises
3 parties, patriots and politics
4 agrarianism
5 the tree of liberty and the rights of man
6 making and breaking the union

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**HI4061 - REFORMATION AND THE MODERN STATE: EUROPE IN THE SIXTEENTH CENTURY**

**ECTS Credits:** 6

**History**

**Rationale and Purpose of the Module:** This module aims to give students a thematic and chronological overview of the history of continental Europe during the sixteenth century. It is intended as a gradual introduction for first-years into the early modern period, and covers a shorter and more manageable time-frame than the previous practice of teaching two centuries in one semester.

**Syllabus:** The waning of the middle ages and the culture of the renaissance; the political geography of early modern Europe - republics, new monarchies and composite polities; Europe in the broader context of the discovery of America; diet, demography and disease; a society of estates - nobles, clergy, merchants and peasants; family life - birth, marriage and death; Charles V, Francis I and the Habsburg-Valois conflict; Luthers protest and the Evangelical movement in Germany and Scandinavia; Calvin and the second Reformation; capturing the hearts and minds of the ordinary people - preaching and literacy; the response of the Catholic Church - Jesuits, the Council of Trent and the alliance of Church and State; Wars of Religion in France and the Netherlands; Philip II and Spanish world hegemony.

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**HI4112 - SOURCES FOR HISTORY**

**ECTS Credits:** 6

**History**

**Rationale and Purpose of the Module:** To provide students with a comprehensive grasp of the origins and nature of the 'Irish Troubles' from the birth of the Irish Republic to the 'Good Friday Agreement'. The course traces the evolution of the political crisis in both Irish jurisdictions, with reference to the British perspective. Themes will include the Anti-Partition League, Clann Na Poblachta and the United Nations; Saor Uladh, Sinn Fein and the IRA during the 'Border Campaign'; Unionism and Loyalism, Cathal Goulding and the move to the Left; special powers and civil rights; Official and Provisional IRA; 'Bloody Sunday' at home and abroad; counter-insurgency in the two jurisdictions; Long Kesh, Portlaoise and Wakefield; Ulster Defence Association, Ulster Volunteer Force, Red Hand Commando and Ulster
Resistance; Saor Eire, Irish National Liberation Army, Irish Republican Socialist Party and Irish People's Liberation Organization; The Hunger Strikes, 'Ulsterization' and the 'Long War'; Section 31, propaganda and 'D notices'; Foreign Affairs, the White House and United Nations; Abstentionism, rise of Sinn Fein and the origins of the Peace Process

**Syllabus:** The course is divided into seminars which address key concepts, events and dynamics of the period. The student will learn to assess the role of such organizations as the Anti-Partition League, Saor Uladh and Sinn Fein in relation to the partition issue. Other themes of the module include Unionism and Loyalism, special powers and civil rights, Official and Provisional IRA, 'Bloody Sunday', counterinsurgency, Long Kesh and paramilitary imprisonment, Hunger Strikes, 'Ulsterization' and 'The Long War', Section 31, and the origins of the Peace Process.

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**HI4127 - UNDERSTANDING THE HOLOCAUST IN 20TH CENTURY EUROPE**

**ECTS Credits:** 6

**History**

**Rationale and Purpose of the Module:** The aim of this module is to provide advanced students with the opportunity to further develop their analytical and research skills through a study of a significant historical issue, namely, the Holocaust/Shoah, in the middle decades of the twentieth century.

**Syllabus:** Jews in inter-war Germany and Europe; war and the racial reordering; everyday life under the Occupation and in the ghettos; deportations; hierarchies of power in the camps; perpetrators; surviving the Holocaust 0 co-optation and resistance; opening the camps 0 reconstructing Holocaust experiences; the Holocaust and historians; the victims' experience and its legacy for contemporary society; interface between the Nazi espousal of eliminationist biology and the motivation of perpetrators; politics and law; victims' varied reactions in the context of national and local communities; national, communal and individual bystanders; recovering Holocaust experiences.

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**HI4187 - HEALTH, STATE AND IRISH MEDICAL CARE, 1837 - 1948**

**ECTS Credits:** 6

**History**

**Rationale and Purpose of the Module:** This module traces the evolution of Irish healthcare provision from the Poor Law 1837 to the introduction of the Mother and Child Scheme in 1948, it will highlight the complexity of nineteenth-century Irish administration and will focus on how the dual system of public and private healthcare and its services emerged; major health concerns which dictated the shape the system such as outbreaks of cholera, typhus and pulmonary tuberculosis; lunacy acts; sanitation law; housing acts; the contagious diseases acts and their implementation and implications for health; the foundation of the Irish Free State and its relationship with the Catholic hierarchy invoked more change in the healthcare sector; issues of social class and healthcare; British policy and technological advances will be highlighted from a comparative perspective.

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**HI4207 - THE FIRST GLOBAL EMPIRE: THE SPANISH MONARCH, EUROPE AND AMERICA 1479 - 1598**

**ECTS Credits:** 6

**History**

**Rationale and Purpose of the Module:** This module is intended as a research-based elective module for final-year undergraduate students. It will build on the success of previously offered elective modules on early modern history by giving students a thematic and chronological overview of the history of Spain and America that is specific to the late medieval period and the sixteenth century. As such, it responds to the very positive student feedback that was received for the old HI4062 module on Court Politics and Culture in Early Modern Spain, 1561-1665.

**Syllabus:** The dynastic union of Castile and Aragon; the inheritance of Charles V; strengths and weaknesses of a composite monarchy; conquest and colonisation of an empire in America; Francisco de Vitoria and the School of Salamanca; the Habsburg-Valois wars in Italy; the establishment of professional conciliar government; the emergence of Madrid as a capital city from 1561; El Greco and the urban decline of Toledo; the conflict against the Ottomans in the Mediterranean; development of an Atlantic economy based on Seville; Church, Inquisition and popular spirituality; construction of the Escorial; faction, court ceremony and the politics of access to the ruler; the religious wars of the later sixteenth century; Alonso Sánchez Coello and Spanish court portraiture; Philip II as Prudent King and secular right arm of the Counter-Reformation, 1559-98.

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**HI4237 - THE MODERN MIDDLE EAST AND THE ARAB-ISRAELI CONFLICT**

**ECTS Credits:** 6

**History**

**Rationale and Purpose of the Module:** The Arab Israeli Conflict is likely one of the most relevant in the contemporary world. This conflict has fascinated and puzzled scholars, politicians and the broader public creating the impression that everyone has an opinion about it. There is not only interest but it also seems that everyone has a recipe to find a lasting solution to this conflict: interestingly most of these solutions are conflicting if not diametrically opposed. This course will study the history of the conflict in the larger context of the modern history of the Middle East following a chronological approach though several themes will be developed throughout the course itself. We will explore and discuss the causes and consequences of the major wars and we will place them in their local and international context.

**Syllabus:** Palestine under the Ottomans; World War One, the Balfour Declaration and the Peace Settlements; 3 The British Mandate; Competing Nationalism: Zionism and Arab Nationalism; 1948 The War for Palestine; Palestinian Refugees and the Status of Jerusalem; Suez Canal Crisis: the Cold War, Nasser and the Conflict; Road to 1967: war of attrition; The paradox of Peace: the October War 1973; Camp David: Cold War and Oil concerns; Lebanon Civil War and the wider region; Israeli policies and the First Intifada; Creating a 'Peace Process': from Madrid to Oslo; Camp David II and the Second Intifada; Simulation: Hope for Peace?
Rationale and Purpose of the Module: The purpose of the module is to provide the student with an introduction to research on a one-to-one basis by embarking on an extended research project of between 9,000 and 13,000 words.

Syllabus: The student will initiate a research project on a topic approved by a supervisor. The student will, by a specific date, submit a 500 word brief which will include a resume of the subject matter, the scope of the project, a review of sources and an outline of the methodology required. The student will start the collection of the necessary data.

IN4003 - PRINCIPLES OF RISK MANAGEMENT
ECTS Credits: 6
Accounting & Finance
Rationale and Purpose of the Module: To introduce the students to concepts and principles relating to the management of risk in both the public and private sector. The student will be expected to understand basic mathematical and financial models in dealing with risk theory as well as understanding the basics of the central theories on risk.

Syllabus: Concepts of risk, pure and speculative risk; actuarial mathematics and elementary risk theory; perceptions of risk; risk in the economic and legal environment; models of risk management; risk management as a decision making process, identification, analysis, evaluation, control, financing of risk; risk management in an organisation and in the public sector; formulation and implementation of risk management strategies; quality and risk management.

IN4005 - RISK ANALYSIS
ECTS Credits: 6
Accounting & Finance
Rationale and Purpose of the Module: To develop in the student an understanding of and insight into risk analysis. 2. To examine the nature of the interface between the corporate risk management function and the insurance sectors servicing response.

IN4007 - GOVERNANCE AND RISK
ECTS Credits: 6
Accounting & Finance
Rationale and Purpose of the Module: To develop in the student an understanding of and insight into the concepts of governance and risk. 2. To examine the nature of the interface between governance structures and risk management practices.
IN4015 - RISK AND INSURANCE
ECTS Credits: 6

Accounting & Finance

Rationale and Purpose of the Module: To meet the needs of the risk management and insurance industry by providing students with a strong understanding of how the insurance industry operates. Students will also learn the important principles underlying risk management. The interest in, and study of, risk has grown significantly due to improvements in the technology used to assess and measure risk and the development of innovations in the insurance and capital markets that control risk. Insurance is one of the main mechanisms used to control risk, through the transfer of that risk to a third party, usually an insurance company. The insurance company in turn is exposed to a variety of risks and can transfer some of these through reinsurance whilst other risks can be controlled using alternative markets. This module will introduce students to the role of insurance within the health market. Furthermore, this module seeks to raise awareness of global issues such as public health, natural disasters, terrorism etc. and the mitigating role of risk management and insurance.

Syllabus: The module details the historical development of insurance industry and more generally the discipline of risk management. The theoretical framework used by insurance companies to internalise risk and attribute a price to that risk are discussed in detail. The module details the development and implementation of a risk management strategy by both private corporations as well as public sector bodies.

IN4725 - RISK AND INSURANCE
ECTS Credits: 6

Accounting & Finance

Rationale and Purpose of the Module: To meet the needs of the risk management and insurance industry by providing students with a strong understanding of how the insurance industry operates. Students will also learn the important principles underlying risk management. The interest in, and study of, risk has grown significantly due to improvements in the technology used to assess and measure risk and the development of innovations in the insurance and capital markets that control risk. Insurance is one of the main mechanisms used to control risk, through the transfer of that risk to a third party, usually an insurance company. The insurance company in turn is exposed to a variety of risks and can transfer some of these through reinsurance whilst other risks can be controlled using alternative markets. With the spiralling cost of health care and the changing demographic in Ireland and Europe there is significant focus on the health care market by the state and the insurance industry. This module will introduce students to t

IN4735 - INSURANCE ORGANISATIONS
ECTS Credits: 6

Accounting & Finance

Rationale and Purpose of the Module: To meet the needs of the risk management and insurance industry by providing students with a strong understanding of how the insurance industry operates. Students will also learn the important principles underlying risk management. The interest in, and study of, risk has grown significantly due to improvements in the technology used to assess and measure risk and the development of innovations in the insurance and capital markets that control risk. Insurance is one of the main mechanisms used to control risk, through the transfer of that risk to a third party, usually an insurance company. The insurance company in turn is exposed to a variety of risks and can transfer some of these through reinsurance whilst other risks can be controlled using alternative markets. With the spiralling cost of health care and the changing demographic in Ireland and Europe there is significant focus on the health care market by the state and the insurance industry. This module will introduce students to t

JA4111 - JAPANESE LANGUAGE, CULTURE AND SOCIETY 1 (ADVANCED)
ECTS Credits: 6

School of Modern Languages and Applied Linguistics

Rationale and Purpose of the Module: To develop communicative skills by revising and consolidating basic structures and vocabulary; to introduce autonomous language learning methods. Emphasis is placed on establishing a solid foundation in the language; by the end of Year 1, students are expected to use all basic grammatical structures with a high degree of fluency and correctness.

Syllabus: Lecture: Japanese culture and society in the
early 21st century. This lecture will be shared with the ab initio stream. Tutorial work: Grammar: introduction to basic grammatical categories and terminology; consolidation of existing grammatical knowledge and expansion into more complex structures; Text analysis & production: principles of textual analysis and text discussion (literary and non-literary); grammar in use/communicative grammar. Autonomous project work on aspects of Japanese culture and society using authentic materials.

**JA4211 - JAPANESE LANGUAGE, CULTURE AND SOCIETY 1**  
ECTS Credits: 6

**School of Modern Languages and Applied Linguistics**

**Rationale and Purpose of the Module:** To provide a firm grounding in understanding, speaking, reading and writing basic Japanese, and aspects of Japanese culture and society, as well as to begin to develop life-long language learning strategies with learners.

**Syllabus:** Listening practice leading to the recognition of numbers, times, days, dates, locations, greetings and questions. Conversation practice based on grammar structures and vocabulary necessary to use greetings, introduce oneself politely, ask basic questions, explain schedules, and talk about pastimes. Reading practice progressing from the understanding of notices and posters to descriptions of people's everyday lives. Writing practice introducing the hiragana and katakana writing systems and 80 kanji progressing to being able to write short descriptions of people's everyday lives. Written exercises concentrating on descriptions and narratives; also memos, letters and notes. Study of a further 170 kanji to bring the total up to 250 characters. Discussion of modern Japanese culture, literature and films.

**Prerequisites:** JA4212

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**JA4247 - JAPANESE LANGUAGE, CULTURE AND SOCIETY 5**  
ECTS Credits: 6

**School of Modern Languages and Applied Linguistics**

**Rationale and Purpose of the Module:** This module consolidates and extends students' abilities in listening and reading comprehension, spoken and written intermediate level Japanese. It also introduces translation from Japanese to English of a variety of literary and other contemporary texts.

**Syllabus:** Listening practice consolidating functions and vocabulary studied up to now; authentic listening from a variety of sources. Speaking practice involving further use of polite language; presentations about work experience and current affairs; spoken summaries of broadcast and reading material at various levels. Reading of authentic or near-authentic passages at intermediate level. Translation of a variety passages into English. Writing practice involving summaries, descriptions, and letters of various levels of formality. Study of a further 170 kanji, to bring the total to 550 characters. Introduction of authentic material by modern Japanese authors.

**Prerequisites:** JA4246

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**JA4911 - JAPANESE FOR BUSINESS 1**  
ECTS Credits: 6

**School of Modern Languages and Applied Linguistics**

**Rationale and Purpose of the Module:** To provide a firm grounding in understanding, speaking, reading and writing basic Japanese, and aspects of Japanese culture and society, as well as to begin to develop life-long language learning strategies with learners.

**Syllabus:** Listening practice leading to the recognition of numbers, times, days, dates, locations, greetings and questions. Conversation practice based on grammar structures and vocabulary necessary to use greetings, introduce oneself politely, ask basic questions, explain schedules, and talk about pastimes. Reading practice progressing from the understanding of notices and posters to descriptions of people's everyday lives. Writing practice introducing the hiragana and katakana writing systems and 80 kanji progressing to being able to write passages involving self-introduction, daily routines, hobbies, and shopping. Reading and discussion in English about Japanese customs, culture and society.

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**JA4913 - JAPANESE FOR BUSINESS 3**  
ECTS Credits: 6

**School of Modern Languages and Applied Linguistics**

**Rationale and Purpose of the Module:** To consolidate further students' ability to understand, speak, read and write Japanese and to further their understanding of Japanese culture and society, particularly relating to the world of work.

**Syllabus:** Understanding of instructions, needs and wants, descriptions of events in order. Speaking exercises explaining actions in sequence, telling stories, making requests and asking permission. Reading more demanding and authentic passages about Japanese life and society. Written exercises concentrating on descriptions and narratives; also memos, letters and notes. Study of a further 170 kanji to bring the total up to 250 characters. Discussion of modern Japanese culture, literature and films.
Prerequisites: JA4912

JA4915 - JAPANESE FOR BUSINESS 5
ECTS Credits: 6
School of Modern Languages and Applied Linguistics

Rationale and Purpose of the Module: To consolidate students’ abilities to comprehend, read, speak and write Japanese developed up to now and to develop further their ability to deal with material relating to Japanese culture and business particularly in the world of work.

Syllabus: Listening comprehension, particularly authentic news broadcasts about business topics; readings about contemporary Japanese life and business; spoken exercises, particularly short presentations and workplace-related conversations; writing of short reports and summaries as well as students’ own opinions on everyday topics.

Prerequisites: JA4914

JA4917 - JAPANESE FOR BUSINESS 7
ECTS Credits: 6
School of Modern Languages and Applied Linguistics

Rationale and Purpose of the Module: This module consolidates and extends students’ abilities in listening and reading comprehension, spoken and written intermediate level Japanese. It also introduces translation from Japanese to English of a variety of literary and other contemporary texts.

Syllabus: Listening practice consolidating functions and vocabulary studied up to now; authentic listening from a variety of sources. Speaking practice involving further use of polite language; presentations about work experience and current affairs; spoken summaries of broadcast and reading material at various levels. Reading of authentic or near-authentic passages at intermediate level. Translation of a variety passages into English. Writing practice involving summaries, descriptions, and letters of various levels of formality. Study of a further 170 kanji, to bring the total to 550 characters. Introduction of authentic material by modern Japanese authors.

Prerequisites: JA4915

JM4003 - INTERVIEWING AND REPORTING
ECTS Credits: 6
School of Culture and Communication

Rationale and Purpose of the Module: Interviewing and reporting aims to develop students’ skills at researching and carrying out interviewing face to face and by telephone, and covering a patch as for a local newspaper.

Syllabus: Students will study interviewing in depth, learning how to select interview subjects, research topics and prepare for the interview. They will carry out a face-to-face interview with a newsmaker in class, reflect on that interview and the ones by fellow classmates, and write up both their own and classmates’ interviews as news stories. They will research and carry out a telephone interview. During the second half of the semester students will be assigned to a local patch, from which they will, with the guidance of the tutor, produce a portfolio including a report on the area, off-diary and on-diary stories and short features, with suitable pictures. This material must be designed into pages for a dummy local paper. Classes throughout the semester will include revision on news writing as the students develop and polish their stories. Assessment will be by coursework: production of a portfolio of interviews and a folder of work from the student’s patch, and a timed exam on news writing and editing.

Prerequisites: JA4912

JM4008 - INVESTIGATIVE JOURNALISM
ECTS Credits: 6
School of Culture and Communication

Rationale and Purpose of the Module: The Investigative Journalism module aims to give students an insight into how to conceive, research and write a piece of investigative journalism to professional standards.

Syllabus: Students will originate an idea, and under the guidance of the tutor will develop it, research it using printed sources and the internet, compile a list of interview subjects and carry out at least two face to face interviews. The research will end in a 2,000 word investigative news feature, with background fact boxes and other material if relevant. The feature must be aimed at a specific newspaper or magazine, and designed into a spread or spreads appropriate to the style of that publication. A research journal of at minimum of 1,500 words will set out the way the research was carried out, what difficulties were encountered, and will include contacts of the interviewees for checking. Assessment will be by the individual student/Es contributions to the final project.

JM4011 - Introduction to Journalism
ECTS Credits: 6
School of Culture and Communication

Rationale and Purpose of the Module: Introduction to Journalism aims to introduce students to the broad range of writing in journalism alongside a grounding on core issues of Journalism theory and practice

The module will introduce a broad range of writing skills from newspapers to magazines of all types, both print and online. It aims to teach students to write short news stories for a variety of publications, including local and national newspapers and websites.

Syllabus: Students will learn the core theories of journalism structures and practice, this will inform students both of existing and changes in structures and practice in the ever changing field. This will include an introduction to journalistic ethics.

In the practical labs students will learn the principles of news reporting, including grammar and working to a style book. They will learn by comparing reports in national and local newspapers and magazines. They will have extensive practice in creating news stories. They will learn to report from speakers, radio and TV programmes and documents and will practise writing intros and structuring a news story both for print and the internet. They will learn about newsroom practices and journalistic routines. They will consider the work of leading news and feature writers and their distinct styles. They will write short profiles of people in the news. Assessment will be by the production of a portfolio of work completed during the course, and a final timed examination.
JM4013 - RADIO JOURNALISM  
**ECTS Credits:** 6  
**School of Culture and Communication**  
**Rationale and Purpose of the Module:** This module is being created to introduce radio journalism to the BA Journalism and New Media degree program, following recommendations by the external examiner and feedback from industry.  
**Syllabus:** The module will examine historical perspectives on the medium of radio and the current organisational structures of radio in Ireland and internationally. The impact of broadcast journalism on democracy will be examined. Areas such as podcasting and on-line streaming, and their impact on news media and on democracy will also be explored. Lectures will also examine radio research techniques, interviewing for audio and on scriptwriting for the ear. Practical classes will focus on the development of skills for professional journalism practice for audio-based outputs, and will take place in studio and in a dedicated newsroom. Writing and presentation skills for radio, microphone technique, voice training, audio mixer operation, telephone recording procedures, the operation of portable recording devices and computer-based editing of audio reportage will be examined.

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**JM4037 - INDIVIDUAL JOURNALISM PROJECT AND PORTFOLIO 1**  
**ECTS Credits:** 6  
**School of Culture and Communication**  
**Rationale and Purpose of the Module:** The individual project aims to help students in-depth reporting, comma writing and design skills through work on a subject of their own choice. It aims to help them project an extended piece of journalism with appropriate research.  
**Syllabus:** Students will choose and research a subject of their choice using all available resources and personal interviewing. They will be guided by a supervisor to ensure their research will be adequate to produce a 4,500 word extended journalistic product, either as one piece, or a group of related pieces. Students will also be required to produce a 30-minute radio documentary OR a 10-minute television documentary OR a multimedia project on this or a related topic, or a series of shorter packages. A target publication and broadcast outlet must be identified. The final work will be designed for print / web / edited for broadcast as appropriate and presented as part of a portfolio of publications produced while a BA student. Students should conduct a series of interviews as appropriate and follow ethical guidelines and use on-the-record sources.

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**JM4047 - JOURNALISM TEAM PROJECT 1**  
**ECTS Credits:** 6  
**School of Culture and Communication**  
**Rationale and Purpose of the Module:** The Team Project aims to polish students' reporting, writing and designing skills to a professional level. It will enhance their ability to work in a team and to meet deadlines. It will allow students to develop problem solving skills. This module will prepare students for Journalism Team Project 2 where students will produce a one off newspaper or magazine.  
**Syllabus:** Students will establish a news room structure with students assigned various roles such as editors, layout designers and beat reporters. Students will develop and practice the structures by producing a rolling news web site. They will develop the concept to publication producing a reader profile and a business case. Students will write news and original features and other material, source pictures, design pages and edit accurately. The final submission will include a statement from each student about what s/he wrote, details of his or her role in the production, and contacts for the sources for the written pieces. Assessment will be by the individual student's contributions to the final project.

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**JM5051 - PROFESSIONAL SKILLS FOR JOURNALISM AND TEAM PROJECT**  
**ECTS Credits:** 9  
**School of Culture and Communication**  
**Rationale and Purpose of the Module:** Professional Skills for Journalism aims to introduce students to the range of skills needed for editing and headline writing for print and internet and designing and creating for print and internet. The Team Project aims to polish students reporting, writing and designing skills to a professional level. It will enhance their ability to work in a team and to meet deadlines.  
**Syllabus:** Students will learn the principles of professional editing, headline and standfirst writing and cutting to length. They will be introduced to the basic principles of illustrating news including taking photographs and generating graphics. They will learn print and website design and will create their own websites. Students will produce a local newspaper or magazine (print or internet-based) for the Team Project. They will write news, features, analysis and editorials; source pictures, design pages and edit accurately. Assessment will be on work produced during the course, a final timed examination (6 credits) and on each individual students contribution to the team project.
JA01 INTRODUCTION TO BROADCAST JOURNALISM
ECTS Credits: 3

School of Culture and Communication

Rationale and Purpose of the Module: This module is being created to introduce broadcast journalism to the Graduate Diploma/MA in Journalism programme in Semester 1 in light of feedback from media professionals, and to improve the current and future employment prospects of the students. The purpose of the module is to give students an historical perspective on radio and to develop their professional practice skills in broadcasting.

Syllabus: The module examines the current organisational structures of radio in Ireland and it analyses the changes that have come about in broadcast journalism. The impact of broadcast journalism on democracy is also examined. The module examines radio research techniques, interviewing for audio and scriptwriting. Practical classes focus on the development of professional journalism practice skills for audio-based outputs and webcasting. These classes are held in the radio studio and in a dedicated newsroom. Writing and presentation skills for radio, telephone recording procedures and editing of audio and visual reportage are examined.

LA001 - LEGAL SYSTEM AND METHOD
ECTS Credits: 6

Law

Rationale and Purpose of the Module: To introduce the discipline of law through an examination of the functioning of the legal system, sources of law and legal methodology.


LA005 - LEGAL ENVIRONMENT OF BUSINESS
ECTS Credits: 6

Law

Rationale and Purpose of the Module: To provide students with a knowledge of the legal environment in which business operates and of the legal principles central to commercial life.

Syllabus: The concept of law. Legal systems: common law systems; the civil law systems; the European Union legal system. Sources of Law: precedent; legislation; the 1937 Constitution, the European Treaties. The administration of justice in Ireland, courts and quasi-judicial tribunals; legal and equitable remedies. The role of law in the business environment, its function and methods, legal philosophy in business law. Core elements of private law. Contractual transactions: formation; formalities; capacity; contractual terms and obligations: standard form contracts; statutory regulation; discharge. Civil liability: negligence; statutory duties and remedies; economic torts: inducement to breach of contract; conspiracy; passing off; deceit and injurious falsehood.

LA009 - INTRODUCTION TO LAWYERING 1
ECTS Credits: 6

Law

Rationale and Purpose of the Module: The aim of this module is to provide a detailed understanding of the operation and practice of the legal system in Ireland, paying particular attention to the necessary skills inherent in the process of law at all levels. It forms part of a sequential number of modules within which this aim is achieved.

Syllabus: The objective of this module is to ensure that upon successful completion, students have a detailed knowledge of the legal process, including an introduction to court structure and procedure, the doctrine of precedent, statutory interpretation and legal research and writing. The syllabus will focus extensively on self-directed learning and active exercises. In addition, students will be expected to explore the role of law in society, paying particular attention to its jurisprudential underpinnings.

LA013 - MEDIA LAW
ECTS Credits: 6

Law

Rationale and Purpose of the Module: This course aims to make students fully aware of the legal framework and constraints within which the media operates, and to enable them to cover courts and other stories with legal implications effectively and with confidence. It also aims to make students fully aware of the major ethical issues that concern journalists. Students will be able to form judgments about ethical dilemmas and articulate a response to them.

Syllabus: The structure of the legal system, with specific relevance to the law as it affects journalists, including defamation, malicious falsehood, criminal libel, blasphemy, contempt of court, reporting restrictions, breach of confidence and copyright. The course will introduce students to major sources (individuals, institutions, campaigning bodies, government bodies, journalists, journals) on media law issues. Students will analyze complex legal issues and be able to apply them to specific legal dilemmas. The course will cover recent developments in the laws on privacy and in particular European human rights legislation. Students will be introduced to the ethical framework surrounding journalism, including the various codes of conduct, and touching on laws such as those of privacy. They will discuss issues of public interest and its bearing on private lives, and the importance of truth, fairness and objectivity. There will be discussions on reporting suicide, mental health issues, questions of taste and decency, and the use of subterfuge to obtain stories, and the questions of sleaze and sensationalism. Representation of women and minorities in the press will be covered, as will the impact of competition, ownership and advertising on journalism. Assessment will be by examination and coursework essay.

LA007 - ADVANCED LAWYERING 1
ECTS Credits: 6
**Syllabus:** Section A.

The objective of this module is to ensure that upon successful completion, students have a detailed knowledge of the role of the courts and the complementary systems of alternative dispute resolution as a forum for dispute resolution and the practical skills involved. Included in this will be the issues of case management, structured settlement procedures such as collaborative law, the Commercial courts, and PIAB. Emphasis will be placed on negotiation, arbitration, conciliation and mediation skills. Significant elements of this module will involve simulation and role-playing in order to develop these skills. Further emphasis will be placed on legal ethics outside of the traditional court structure.

Section B.

The objective of this Section of the module is to provide an elective for students to deepen their understanding of the legal process in an area of particular interest. Students will be expected to elect one from the list below. All elections are subject to space limitations, availability and resources. Students cannot be guaranteed any specific choice. Choices may vary from year to year and the list below is indicative rather than exhaustive.

Choose one from:

- Business Law Clinic: a team of students will have the opportunity to use their client interviewing skills and provide assistance and information to small companies and sole traders
- e-Journal: a team of students will be responsible for the selection, editing and verification of an e-journal on legal topics which will be posted in the Law School website.
- Research Article: students will, either individually or as pairs engage in the research and writing of a legal topic in which they are interested under the supervision of a faculty member.
- Conveyancing Problem: two teams of students will undertake a complex hypothetical conveyancing transaction under the guidance of a faculty member.
- Moot Trial: two teams of students will undertake the running of a trial on a major hypothetical case based loosely on an actual case.
- ADR process: students will engage in a fact scenario involving either collaborative law or mediation with the aim of resolving a dispute between individuals without recourse to litigation.

**LA4021 - CHILD LAW**

ECTS Credits: 6

**Law**

**Rationale and Purpose of the Module:** The desire to protect children from harm and to recognise their rights as autonomous individuals is an increasingly accepted goal in legal scholarship. The aim of this module is to consider the rights of children and how they may be advanced by the legal system. This involves gaining an understanding of the protection of children’s rights both at domestic and international levels, as well as considering specific aspects of the law which impact upon children’s lives.

**Syllabus:** This module covers: children’s rights in the Irish Constitution, the European Convention on Human Rights and the United Nations Convention on the Rights of the Child; child participation and representation in legal proceedings; child protection and children in care; youth justice; garda vetting procedures and mandatory reporting of child abuse; bullying; child abduction; adoption and; education.

**LA4022 - COMMERCIAL LAW**

ECTS Credits: 6

**Law**

**Rationale and Purpose of the Module:** To familiarise the student with the legal background of commercial transactions.

**Syllabus:** Contracts for the sale of goods, consumer protection, reservation of title clauses, hire purchase and leasing. Commercial contracts of agency, bailment, carriage of goods by land, sea and air. Financial services law, negotiable instruments, cheques, electronic transfer of funds, free movement of capital within Europe, European banking regulation. Intellectual property rights, trademarks, copyright and patents, creation, protection, endurance and profit. Regulation of competition policy, national and European, comparative view of US anti trust legislation, enforcement mechanisms, the relationship between intellectual property rights and competition abuses. Remedies at Law and Equity, alternative mechanisms for dispute resolution, arbitration, private courts, negotiation. Bankruptcy, personal versus corporate, historical evolution, philosophical basis, Bankruptcy Act 1988, comparative views from the U.S.

**LA4033 - LAW OF THE EUROPEAN UNION 1**

ECTS Credits: 6

**Law**

**Rationale and Purpose of the Module:** The aim of the module is to equip the student with an understanding and knowledge of the basic principles and rules of the European Union, including: the origins and character of European Union law, beginning with the three original Community Treaties, developments from the 1960s up to the Lisbon Treaty. Each of the Institutions will be examined: Parliament, Commission, Council, European Council, Court of Auditors, European Central Bank and the Court system. Sources of law-Primary (Treaties), Secondary (Regulations, Directives etc), Case law of the Court of Justice of the European Union. Enforcement of EU law-Infringement proceedings (Article 258), proceedings for failure to act (Article 265), proceedings for failure to fulfil an obligation (Article 259); Preliminary references-Article 267; Legislative process-role of the institutions, Relationship between EU Law and national law-Supremacy and Direct Effect; Development of Human rights and the effect of EC/EU membership on Ireland.

**Syllabus:** The module covers, in the first instance, the history of the European Communities and the various Treaty amendments up to the Treaty of Lisbon. The module proceeds to consider the role, function and legislation powers of the Commission, Parliament and Council. The module will also examine the European Council, the Court of Auditors and the European Central Bank. The Court system and the types of actions heard by the Court of Justice, the General Court and the Civil Service Tribunal will also be covered. The new legislative procedures, the ordinary legislative procedure and the special legislative procedure as introduced by Lisbon will be examined. The development of human rights and the principles of direct effect and supremacy will be
considered. Finally, the evolution and impact of membership of the EC and EU on Ireland will be examined.

LA4051 - CRIMINAL LAW 1 (ONLINE)
ECTS Credits: 6

Law

Rationale and Purpose of the Module: To examine the general principles of criminal law through consideration of their ethical, social and legal dimensions. The module will be offered to students taking the one year level 8 BA in Applied Policing and Criminal Justice. The programme is delivered online.


LA4056 - HOUSING LAW AND POLICY
ECTS Credits: 6

Law

Rationale and Purpose of the Module: The aim of this module is to provide students with an understanding of the legal and policy issues surrounding housing law - an area of law that is attracting increasing attention and controversy at both a national and international level. In addition to affording students a broad understanding of the various sources of housing law in Ireland, the module will consider the policy implications of housing and homelessness. The module seeks to introduce students to key areas of legal study including social housing and the Housing Acts, landlord and tenant law and the Residential Tenancies Acts.

As well as meeting the needs of our undergraduate students, the introduction of a module focused on Housing Law and Policy responds to a clear educational need as identified by those in the Community Education & Volunteer sector (initially the Community Law and Mediation Group, see http://www.communitylawandmediation.ie/). Collaborating with partners such as CLM and meeting their educational needs (by also delivering the module online, see below), enables UL to support its local and regional communities. Such engagement moreover supports the University of Limerick in achieving its Strategic Goals as identified in Broadening Horizons, particularly those in Theme 1.2 “Support our local and regional communities”.

The module will be offered on both the daytime and evening scheduled periods. However, the application form will not allow for both.

Syllabus: This module covers: an introduction to the historical, cultural and legal foundations of Irish housing law; the right to housing under Irish and international human rights law; social housing and the Housing Acts; property law including mortgage law; landlord and tenant law; Residential Tenancies Acts; housing liability; social policy considerations of housing law; homelessness.

LA4061 - CRIME AND CRIMINAL JUSTICE (ONLINE)
ECTS Credits: 6

Law

Rationale and Purpose of the Module: The Crime and Criminal Justice module aims to critically evaluate the institutions and operation of the criminal Irish justice system in comparative perspective. The module aims to introduce students to the main approaches and theories in the field of crime and criminal justice studies, and the mechanisms by which the criminal justice system responds to the incidence of crime. The module also examines the influence of the media influence on public attitudes towards crime, criminal justice processes and sentencing, criminal justice policy making, reform and anti-crime initiatives.

Note: As the BA in Applied Policing and Criminal Justice is currently undergoing APRC approval this programme cannot be selected from the drop-down list of programmes on which the module will be offered (question 13).

justice; the Drugs Court. The juvenile justice system. Penal policy and rationales for sentencing. Sentence management and the treatment of offenders; conditions of imprisonment; scrutiny of the prison system including judicial review and visiting committees; the Inspector of Prisons and Place of Detention. The adoption of civil mechanisms in the criminal justice system: seizure of criminal assets and other proceeds of crime; anti-social behaviour orders.

LA4071 - PROJECT 1 (ONLINE)
ECTS Credits: 6

Law

Rationale and Purpose of the Module: The purpose of the module is to provide the student with an introduction to research as taught on a one-to-one basis by embarking on an extended research project of 8,500 words.

Please note that this module will be delivered as part of the BA in Applied Policing and Criminal Justice. This programme has not yet been approved and so does not appear on the dropdown list of programmes on which the module will be offered (question 13) and so that section has not been populated.

Syllabus: The student will initiate a research project on a topic approved by a supervisor. The student will, by a specific date, submit a 500 word brief which will include a resume of the subject matter, the scope of the project, a review of sources and an outline of the methodology required. The student will start the collection of the necessary data.

LA4081 - FAMILY LAW (ONLINE)
ECTS Credits: 6

Law

LA4101 - LAW OF EVIDENCE (ONLINE)
ECTS Credits: 6

Law

Rationale and Purpose of the Module: The Law of Evidence is the means by which we go about determining accurately what occurred in the past, while also determining how it ought fairly to be understood or interpreted, and how it ought fairly to be evaluated. It is the material offered in court during a trial for the purpose of enabling the finder of fact (judge or jury) to reach a decision on the issues in dispute. The purpose of this online course is to examine all of the main topics within the Law of Evidence. Along with such basic concepts as relevance and the court’s discretion to exclude technically admissible evidence, the topics that will be covered include the burden of proof, the course of the trial, the competence and compellability of witnesses, the opinion rule, the rule against hearsay, cross-examination, the law governing the admissibility of confessions, corroboration, privilege, and the principles that regulate the admission of character evidence.

The programme has been approved by APRC, but it is not available yet on the programme listing set out below in question 13.

Syllabus: The purpose of this online course is to examine all of the main topics within the Law of Evidence. Along with such basic concepts as relevance and the court’s discretion to exclude technically admissible evidence, the topics that will be covered include the burden of proof, the course of the trial, the competence and compellability of witnesses, the opinion rule, the rule against hearsay, cross-examination, the law governing the admissibility of confessions, corroboration, privilege, and the principles that regulate the admission of character evidence. It will be suitable for anyone with an interest in the court process and fact finding.

PROGRAMME CONTENT

Week 1: Introduction
Week 2: Burden of Proof
Week 3: Competence and Compellability
Week 4: Corroboration
Week 5: Opinion Evidence
Week 6: Cross-Examination
Week 7: Similar Fact Evidence
Week 8: Hearsay
Week 9: Confessions and Admissions
Week 10: Illegally and Unconstitutionally Obtained Evidence
Week 11: Privilege
Week 12: Discovery

LA4111 - CONTRACT LAW 1

ECTS Credits: 6

Law

Rationale and Purpose of the Module: To provide the legal basis for the creation and enforcement of contracts and to examine what restrictions exist regarding freedom to contract.


LA4205 - NURSING AND MIDWIFERY AND THE LAW
ECTS Credits: 3

Law

Rationale and Purpose of the Module: This module provides an understanding of the role and application of the legal process in the practice of nursing and midwifery.

LA4211 - CRIMINAL LAW 1  
ECTS Credits: 6  

Law  
Rationale and Purpose of the Module: To examine the general principles of criminal law through consideration of their ethical, social and legal dimensions.  


LA4310 - LAW OF TORTS 1  
ECTS Credits: 6  

Law  
Rationale and Purpose of the Module: To evaluate critically the role of the law of torts in society, to examine the basic elements of a tort with particular emphasis on negligence and the defences thereto.  


LA4430 - CONSTITUTIONAL LAW 1  
ECTS Credits: 6  

Law  
Rationale and Purpose of the Module: Currently, the School of Law delivers lectures on the Irish Constitution to all our LLB degrees and to a number of FAHSS courses. These modules are entitled Public Law 1 and Public Law 2. The term Public Law is outdated and cumbersome. The two new modules being created will keep the content of the Public Law modules but will use the more commonly used name of Constitutional Law. It will be to the advantage of students, and professional bodies and employers with which they deal, as the term Company Law bears the more commonly used term for the study of this area of law.  

Syllabus: The aim of the module is to equip the student with an understanding and knowledge of the basic principles and rules of Irish company law, including; the concept of separate legal personality and exceptions thereto, corporate contracts, the nature of shares in private companies limited by share, the rights of shareholders, the remedies available to shareholders, the role of share capital and issues surrounding corporate borrowing and security. The policy reasons for individual rules are explained and the aim is to assist the students understanding of company law, as well as to facilitate knowledge of those technical rules.  

LA4530 - COMPANY LAW 1  
ECTS Credits: 6  

Law  
Rationale and Purpose of the Module: To examine the fundamental aspects of legal control over real property, including the legal evolution of title.  


LA4610 - LAND LAW 1  
ECTS Credits: 6  

Law  
Rationale and Purpose of the Module: To examine the basic elements of a tort with particular emphasis on negligence and the defences thereto.  

LA4810 - EQUITY AND TRUSTS 1  
ECTS Credits: 6

Law

Rationale and Purpose of the Module: To examine the growth and development of equity, particularly equitable doctrines and equitable remedies available in the modern Court.

Syllabus: The nature of equity and historical development, maxims, equitable remedies - the injunction, specific performance, rescission, rectification, specific performance, estoppel. Equitable doctrines - conversion, election, satisfaction and ademption.

LA4901 - PRINCIPLES OF LAW  
ECTS Credits: 6

Law

Rationale and Purpose of the Module: Principles of Law is an introduction to law for non-law students

Syllabus: The module provides the student with a basic knowledge of the Irish legal system, the Irish Constitution, the legal profession in Ireland, sources of Irish law, European Union law, Criminal law and Tort law.

LA5021 - MEDIA LAW  
ECTS Credits: 9

Law

Rationale and Purpose of the Module: This course aims to make students fully aware of the legal framework and constraints within which the media operates, and to enable them to cover courts and other stories with legal implications effectively and with confidence. It also aims to make students fully aware of the major ethical issues that concern journalists. Students will be able to form judgments about ethical dilemmas and articulate a response to them.

Syllabus: The structure of the legal system, with specific relevance to the law as it affects journalists, including defamation, malicious falsehood, criminal libel, blasphemy, contempt of court, reporting restrictions, breach of confidence and copyright. The course will introduce students to major sources (individuals, institutions, campaigning bodies, government bodies, journalists, journals) on media law issues. Students will analyze complex legal issues and be able to apply them to specific legal dilemmas. The course will cover recent developments in the laws on privacy and in particular European human rights legislation. Students will be introduced to the ethical framework surrounding journalism, including the various codes of conduct, and touching on laws such as those of privacy. They will discuss issues of public interest and its bearing on private lives, and the importance of truth, fairness and objectivity. There will be discussions on reporting suicide, mental health issues, questions of taste and decency, and the use of subterfuge to obtain stories, and the questions of sleaze and sensationalism. Representation of women and minorities in the press will be covered, as will the impact of competition, ownership and advertising on journalism. Assessment will be by examination and coursework essay on ethics.

LA5101 - INTRODUCTION TO COMPARATIVE AND EUROPEAN LAW  
ECTS Credits: 9

Law

Rationale and Purpose of the Module: The aim of this module will be to demonstrate the nature of civil obligations within different legal systems. Considerable emphasis will be placed on the differences between common law and civil law theory of obligations, and in particular the consequences of co-existence of both legal traditions within an increasingly federal framework. In that regard, the Canadian legal system will be used for analysis, alongside the approach adopted by the European Union and the reactions of individual member states, in particular Ireland, France and Germany.

Syllabus: Definition of civil obligation: A contractual and tortuous relationships; voluntary versus imposed obligations at law; standard of duty required in the civil obligation relationship; the role of law in giving legal effect to the relationship and the remedies available, the use of restitutionary and promissory doctrines to supplement contractual and tortuous relationships.

An historical comparative analysis of the legal basis of civil obligations; historical development of Irish civil obligations law, in particular English common law influence and more recent European law rules.
influences.
historical development of French and German civil obligations law;
historical development of Canadian civil obligations law,
English, French and American influences;
historical development of restitutionary and promissory doctrines.

Current European law of civil obligations:

a brief examination of contractual and tortuous liability in
France and Germany;

primary and secondary source materials in
common and civil law jurisdictions; electronic databases;

Syllabus:

a brief examination of product liability regimes;
a brief examination of contractual term regulations.

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LA5132 - COMPARATIVE LEGAL RESEARCH SKILLS
ECTS Credits: 3

Law

Rationale and Purpose of the Module: To provide students with the ability to conduct high level research in both common and civil law systems.

Syllabus: Primary and secondary source materials in common and civil law jurisdictions; electronic databases; quantitative and qualitative analysis.

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LA5153 - COMPARATIVE INTERNATIONAL PROTECTION OF HUMAN RIGHTS LAW
ECTS Credits: 9

Law

Rationale and Purpose of the Module: To explore the protection of human rights in international law

Syllabus: A Comparative study of the principles, concepts, rules and procedures underpinning the protection of human rights in international law from a comparative perspective including in particular: rights theory; universality versus cultural relativism, legislating for human rights; status of human rights treaties; judicial procedures for the enforcement of human rights; state reporting procedures; policing compliance with human rights standards; fact-finding and evidence; sanctions; individual rights and freedom; collective rights

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LA6011 - INTERNATIONAL BUSINESS TRANSACTIONS
ECTS Credits: 6

Law

Rationale and Purpose of the Module: To build on the students' knowledge and understanding of commercial transactions in a cross-border environment. The aim of this module is to expose students to a comprehensive understanding of the laws which govern international business transactions both at the micro and macro level. Students will gain a deeper knowledge of the legal issues arising in international contracts for the sale of goods and the international financial instruments which support such commerce.
The Grading type for this module is Normal. The level of Award is Level 9 and the module is to be centrally scheduled in the same manner as other taught postgraduate modules.

Syllabus: The module will examine the following legal issues that arise in international transactions:

- International contracts for the sale of goods, problems of formation, construction and enforcement, including e-commerce transactions, choice of law and jurisdiction issues.
- Import regulation: WTO regime; US Trade authorities; US import controls; free trade agreements; tariffs; classification, valuation and origin principles; non-tariff barriers
- Export regulation: Export controls from the US; export licenses; national security issues; exports to NAFTA jurisdictions; exports to EU jurisdictions

Contextualising international trade: Anti-dumping and antitrust issues; Subsidies and countervailing subsidies; state trading entities; the Foreign Corrupt Practices Act and illegal payments abroad, US s.301 proceedings, and the US Boycott and Anti-Boycott rules.

International Finance, including letters of credit and ETF Transactions; off-shore banking and tax efficiencies

International Business Litigation and Dispute Resolution, arbitration and enforcement of arbitral awards; recognition and enforcement of foreign awards, including a documentary analysis.

Overseas investment, including investment in the EU, developing countries and investments in NAFTA members. Expropriation of overseas investments. Ethical investment policy.

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LA6021 - LAW OF INTERNATIONAL BUSINESS ASSOCIATIONS
ECTS Credits: 9

Law

Rationale and Purpose of the Module: The aim of this module is to familiarise students with modern international business structures. The module will also examine the importance of corporate governance and the appropriate governance structures in different jurisdictions.

Syllabus: An overview of the historical development of the corporate structure in western commercial law from the early state based trading corporations to the rise of private enterprise units. This will be coupled with an introduction to theoretical frameworks of business structures and their legal regulation

An introduction to modern business structures that operate on an international level, including sole trader, registered companies, real estate investment trusts, special purpose entities, joint ventures, franchise arrangements and distribution networks.

The legal process of creating different business structures in different jurisdictions. The concept of residency, centre of management, and the determination of corporate citizenship. The historical development of corporate formation in the USA, the role of the Delaware corporation in US interstate commerce, modern formation processes in US corporate law.
Corporate frameworks in the European Union in particular the European Company (SE), The evolution of corporate governance structures in the European Union at both State and European level, including aspects of the "Smart Regulation in the European Union" agenda Corporate formation in China as totally foreign owned entities and the role of joint ventures in corporate formation. Governance issues in Europe, the USA and China, the role of shareholders and investors, restrictions on management, the integration of Labour into corporate oversight and development, and the different institutions involved in enforcing corporate governance provisions including the effect of the Sarbanes-Oxley Act in the USA Cross border mergers and acquisitions, including national control over corporate ownership in protected sectors, such as the press, transportation, etc.

LA6022 - COUNTER TERRORISM LAW AND INTERNATIONAL BUSINESS
ECTS Credits: 9

Law

Rationale and Purpose of the Module: The aim of this module is to expose students to a comprehensive understanding of the global responses to terrorism as it impacts upon the legal environment in which international business takes place.

Syllabus: This course will introduce students to the legal constraints on the operation of international business prior to the events of 9/11. Elements of UK counter-terrorism laws with respect to Northern Ireland, the use of customs and excise agencies and covert surveillance of business entities will be examined, including the wider European context of human rights issues. The course will then look at the impact of 9/11, the London and Madrid bombings and the response of both the EU and the US in creating a legislative arsenal designed to disrupt and destroy a common terrorist threat.

The course will focus on three of the most important areas governed by this new legal environment.

First, the increased monitoring of financial transactions both domestic and international. It will examine the role and legal responsibility of various financial institutions in monitoring and reporting suspicious activities surrounding the movement of money and financial assets. It will look at the legal controls on the right to move money across borders and the powers of confiscation based on suspicion versus proof. It will look at various laws that seek to prevent money laundering through international business transactions. It will cover the serious consequences, including both financial and custodial sanctions for breaches of these responsibilities.

Second, the course will deal with the rapidly expanding surveillance of communications traffic and the collection and interrogation of information held by private individuals and corporations. It will contrast the competing legal obligations of privacy and security. It will examine differing approaches from both EU and US authorities as to the nature and scope of privacy rights and the obligations of private enterprise service providers such as mobile phone operators to retain and supply records belonging to third parties.

Third it will examine the regulation of bribery and corruption in international business transactions, the theoretical issues involved as to whether those bribery and corruption is best dealt with on the supply or the demand side and the cultural differences as to the definition of bribery and corruption. It will explore the increasing link between bribery and corruption and international terrorism. It will introduce the role of sanctions in such actions and the effectiveness of implementing them.

Finally the course will examine the role of EU and US enforcement agencies in the implementation of counter-terror law in a commercial context, the consequences for business people and the implications for private enterprise.

LA6031 - LAW OF INTERNATIONAL TRADE ORGANISATIONS
ECTS Credits: 9

Law

Rationale and Purpose of the Module: The aim of this module is to expose students to a comprehensive understanding of the global trading environment and the legal institutions, laws, rules and regulations that apply to cross border transactions.

Syllabus: This course will introduce students to the historical evolution of the legal provisions, relating to international trade, ranging from the Hanseatic League up to the period after World War II which establishes the modern global trading environment. It will briefly discuss the differing theories of international trade. The course will then examine the following institutions, their legal basis and operation and their legal control over international trade.

1. The WTO, its precursor (GATT) the establishing Treaty and the rules on accession and secession, the governance structure of the organisation, the interaction of its decisions and rules with national laws and the role it plays in dispute resolution between signatory states.

2. Regional trading organisations such as NAFTA (North American Free Trade Association) and the EU (European Union), in particular the legal basis of establishment, the interaction between national laws and the role of the regional trading organisation as arbiter, the process of dispute resolution between members of the regional organisation and the hierarchy of laws and issues of primacy between competing regulations.

3. UN bodies engaged in assisting the development of international trade, including UNCITRAL (United Nations Commission on International Trade Law) its role in providing a uniform legal environment within which international trade occurs and UNCTAD (the United Nations Conference on Trade and Development).

4. National enforcement agencies, such as CBP (Customs and Border Protection (USA)) and the EU approach, their role and function and the extra-territoriality of their legal powers. Finally the course will look at ethical and sustainable movements in international trade and their incorporation into national and regional legal systems.

LA6041 - COMPARATIVE PRIVATE LAW
ECTS Credits: 9

Law

Rationale and Purpose of the Module: This module introduces students to the study of comparative and European approaches to private law, focusing on civil obligations and property law. For civil obligations, students will explore (i) the theories, laws and practices of different traditions and (ii) the consequences of the existence of those traditions within the European legal framework. For property law, students will be equipped with (i) an
advanced understanding of its theory, law and practice in different jurisdictions and (ii) the knowledge and skills necessary to appreciate it from a comparative perspective.

**Syllabus:** Students will be introduced to comparative and European private law. The module will focus on the law of obligations and property law:

- its historical development
- its key and distinguishing elements
- its classifications and protections
- its approaches in specific jurisdictions.

- its effectiveness at fulfilling the objectives of private law
- the responses of various jurisdictions to common difficulties and disputes
- its relevance to Irish private law.

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**LA6051 - PENOLOGY AND VICTIMOLOGY**

ECTS Credits: 9

**Law**

**Rationale and Purpose of the Module:** The purpose of this course is to provide students with an understanding of crime, criminal justice and social regulation. In particular the aims of the module are as follows: to provide analyses of the primary penal disposals (both contemporary and historical) utilised in society; to highlight the various political, social, cultural and economic determinants that underpin the provision of penal dispositions; to encourage theorisation about punishment and penal responses; to highlight the needs and concerns of victims of crime; to determine how change is possible in the penal complex – in particular, how sanctions are modified or supplanted and how stakeholders, such as victims, emerge; to examine new ‘logics’ and ‘discourses’ on punishment and justice as they emerge; and, to provide a framework of understanding modern penal systems and the forms of social organisation in which they operate.

**Syllabus:** This module covers the emergence of penal welfarism and individualisation of treatment, the culture of control in late modern society, the emergence of prison and the disciplinary society, issues such as exclusion, governance, and expressive punishments, the politicisation of law and order, the return of the victim, Norbert Elias and the civilising society; Emile Durkheim and social solidarity; Cohen’s dispersal of discipline thesis, and crime and punishment in Ireland.

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**LA6061 - CONTEMPORARY CHALLENGES IN MEDICAL LAW AND ETHICS**

ECTS Credits: 9

**Law**

**Rationale and Purpose of the Module:** The aim of this module is to enable students engage in critical analysis of contemporary challenges which lie at the intersection of law, ethics, and medicine. This module is designed to provide an appropriate introduction to the subject for students with no previous familiarity with medical law, while by way of recommended reading and further study, allowing students who have already been introduced to the relevant areas of law, to enhance their knowledge and understanding.

The module will enable students to recognise and analyse the legal and ethical challenges arising in medical law. It will equip students with an understanding of what the law currently is and what legal principles arise in day-to-day clinical practice. The student will critically engage with literature on topics such as organ transplantation, euthanasia, and the duty of confidentiality. Furthermore, there is a significant comparative law element in this module. This comparative element ensures that the student appreciates the range of legal and ethical approaches which ultimately influence and shape the legal framework for medical law in any given jurisdiction. Overall, students will advance their analytical skills and develop their capacity to reflect critically on contemporary challenges in medical law and ethics.

**Syllabus:**
- Introduction to Medical Law and Ethics
- Consent (Autonomy, Capacity, Informed Consent)
- Confidentiality and Privacy
- Clinical Negligence
- Healthcare Decisions for Children and Young People
- Regulating Reproduction (Surrogacy, Donor Assisted Human Reproduction, Abortion)
- Euthanasia and Assisted Suicide
- Palliative Sedation and Treatment Withdrawal
- Patient Autonomy at the End of Life: Advance Care Directives and DNR’s
- Organ Transplantation
- The Role and Application of Bioethics

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**LA6101 - INTERNATIONAL BUSINESS TRANSACTIONS**

ECTS Credits: 9

**Law**

**Rationale and Purpose of the Module:** To build on the students' knowledge and understanding of commercial transactions in a cross-border environment. The aim of this module is to expose students to a comprehensive understanding of the laws which govern international business transactions both at the micro and macro level. Students will gain a deeper knowledge of the legal issues arising in international contracts for the sale of goods and the international financial instruments which support such commerce. The Normal grading type is to apply to this module.

**Syllabus:** The module will examine the following legal issues that arise in international transactions:

- International contracts for the sale of goods, problems of formation, construction and enforcement, including e-commerce transactions, choice of law and jurisdiction issues.
- Import regulation: WTO regime; US Trade authorities; US import controls; free trade agreements; tariffs; classification, valuation and origin principles; non-tariff barriers.
- Export regulation: Export controls from the US; export licences; national security issues; exports to NAFTA jurisdictions; exports to EU jurisdictions.
- Contextualising international trade: Anti-dumping and antidumping issues; Subsidies and countervailing subsidies; state trading entities; the Foreign Corrupt Practices Act and illegal payments abroad, US s.301 proceedings, and the US Boycott and Anti-Boycott rules.
- International Finance, including letters of credit and ETF Transactions; off-shore banking and tax efficiencies.
- International Business Litigation and Dispute Resolution, arbitration and enforcement of arbitral awards.
LA6111 - Criminal Justice Processes and Sentencing
ECTS Credits: 9

Law

Rationale and Purpose of the Module: The aim of this module is to provide a detailed understanding of criminal justice processes and sentencing procedures and to encourage students to question the place of human rights within that system. By the end of the course students should be familiar with the various stages in the processes in Ireland, be aware of the strengths and weaknesses, see how human rights should fit into that system and have knowledge of comparative systems.

Syllabus: The module will explore the influence and progress of the most developed regional mechanism for human rights protection. Convention rights will be examined on an article by article basis providing for a critical assessment of the development of each right and its treatment by the European Court of Human Rights. At the end of the course, students will be familiar with the articles and case law of the European Convention on Human Rights, and the additional Protocols and will have gained a comprehensive understanding of the practice and procedure of the European Court on Human Rights.

LI4001 - PEER TUTORING FOR LANGUAGES
ECTS Credits: 3

School of Modern Languages and Applied Linguistics

Rationale and Purpose of the Module: This module aims to provide students who are native speakers of a language other than English which is taught in the School of Languages, Literature, Culture and Communication (hereafter referred to as LOTE students) with the appropriate training, guidance and support to effectively facilitate peer-led discussion groups or one-to-one sessions in the target language for UL language learners of French, German, Irish, Japanese and Spanish. It also aims to provide the LOTE students with transferable knowledge and skills which will be of use to them in their future careers and in their own language learning.

This module mainstreams a project which has been very successfully running with AHSS Faculty Development Teaching Fund since September 2012. In AY 2012-13, 19 LOTE students were trained as peer tutors and 133 hours of additional language practice were provided. Substantially more hours are being provided in AY 2013-14 (32 peer tutors have enrolled in the Autumn Semester).

Practising the language is paramount in achieving fluency and accuracy, and yet language studies programmes within Higher Education are understandably limited in the amount of focused language practice they can offer. This module aims, therefore, also to address this issue by providing multilingual peer tutoring in a systematic manner, parallel to existing language studies modules. Consequently, the module equally provides additional benefit in supporting all UL language students participating in the discussion groups and/or one-to-one sessions.

Syllabus: This module will prepare LOTE students to facilitate peer-led discussion groups and one-to-one sessions in their native language. It will particularly focus on the following aspects:
- The role of a facilitator of a discussion group or one-to-one session
- The difference between teaching a language class and facilitating a discussion group or one-to-one session
- The skills and techniques necessary to break the ice within a group or in a one-to-one session
- The feedback which it is appropriate to give to attendees (grammar, vocabulary, pronunciation, register, etc.)
- The role of attendees' language-learning background
- Relevant topics for the discussion-group sessions and one-to-one sessions
- Communication issues which may arise (e.g. cultural differences)
- Key communication strategies necessary to encourage participation in a discussion group
- The main linguistic pitfalls for language learners
- The nature and role of a reflective portfolio.

LI4211 - LINGUISTICS 1
ECTS Credits: 6

School of Modern Languages and Applied Linguistics

Rationale and Purpose of the Module: The module is designed to serve as an introduction to basic concepts and theories in linguistics. The various subfields and branches of linguistics will be introduced and discussed in class lectures.

Syllabus: The module comprises four distinct but also interrelated themes, each of which will be dealt with in sequential blocks over the twelve week module:
1. Nature of language and linguistics: In this first part, students will be introduced to basic concepts in linguistics, including: language, duality, arbitrariness.
2. Phonetics & Phonology: In this second part, students will
learn how to recognise and categorise the sounds of English and other languages.
3. Morpho-Syntax. In the third section, students will focus on how words are formed and how they combine to make sentences.
4. Semantics and Pragmatics: The final section of the module will focus on meaning and its relevance to the study of language.

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**LP4203 - PROJECT 1**  
ECTS Credits: 6

**Law**

Rationale and Purpose of the Module: The purpose of the module is to provide the student with an introduction to research as taught on a one-to-one basis by embarking on an extended research project of 8,500 words.

Syllabus: The student will initiate a research project on a topic approved by a supervisor. The student will, by a specific date, submit a 500 word brief which will include a resume of the subject matter, the scope of the project, a review of sources and an outline of the methodology required. The student will start the collection of the necessary data.

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**LP6011 - LANGUAGE PEDAGOGY 1: THE LANGUAGE TEACHER AS PROFESSIONAL PRACTITIONER**  
ECTS Credits: 6

**School of Modern Languages and Applied Linguistics**

Rationale and Purpose of the Module: This module examines the historical context, development and position of language teaching and learning in Ireland, introduces students to key areas of current language pedagogy, and supports them in adapting generic educational principles to the post-primary language classroom. It aims to develop a research-based, critical approach to the study of theoretical perspectives underpinning the teaching of languages and the language-learning process and to engage students in reflective discussion on the application of pedagogical theory to classroom practice in the Irish post-primary context.

**Syllabus:** Language teaching and learning in Ireland: historical developments; national and EU language policy; the position of languages in Irish society; engendering openness to other cultures and languages; cross-curricular aspects of teaching languages. Theoretical perspectives: theories of language, theories of language teaching and learning and resulting methodologies. Planning: critical evaluation of language syllabi within the broader curriculum; syllabus implementation in the language classroom; alternative post-primary programmes (JCSP, LCE, LCA, LCVP, TYP). The practice of language teaching: teaching vocabulary, pronunciation and grammar; balancing productive and receptive skills; culture and language; literature and film; developing cultural awareness; communicating perspectives on development issues; the multi-cultural classroom; sourcing, selecting, evaluating and managing teaching resources; traditional and new technologies in language teaching/learning; levels and differentiation; standard and alternative assessment models; marking, recording and reporting; task and project work; developing strategies for autonomous and collaborative language learning. Classroom management: teaching through the target language; interaction patterns; elicitation; error correction, mixed ability classes.

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**MA2121 - FOUNDATION MATHEMATICS 1**  
ECTS Credits: 6

**Mathematics & Statistics**

Rationale and Purpose of the Module: To provide a core of mathematics which is a significant mathematical experience for students. To provide students with an appropriate and sufficient mathematical foundation for further study of mathematics at higher education.

**Syllabus:** Modelling using mathematics: simple models; the modelling process; solving simple mathematical models. Numbers and number sense 1: basic arithmetic facts and operations; using a calculator. Numbers and number sense 2: fractions; percentages; ratio and proportion; more on calculators; approximation and estimation. Algebra 1: algebra as generalized arithmetic; terms and expressions; simplifying algebraic expressions; simple equations and their solution; using formulae. Measurement: standard units; unit conversions;
accuracy and precision; everyday use. Geometry: basic properties of angles, triangles, circle, polygons, 3-D figures; right angle triangles; symmetry. Functions and graphs 1: concept of function; tables and ordered pairs; coordinated plane and graphs; the straight line; gradient, chord, average rate of change.

MA2131 - FOUNDATION ENGINEERING MATHEMATICS 1
ECTS Credits: 6

Mathematics & Statistics

Rationale and Purpose of the Module: To develop the student's understanding of and problem solving skills in the areas of Pre-Calculus and Differential Calculus.


MA4001 - ENGINEERING MATHEMATICS 1
ECTS Credits: 6

Mathematics & Statistics

Rationale and Purpose of the Module: To introduce the student to the Laplace Transform, Fourier Series, and their use in solving Ordinary Differential Equations. To introduce the student to the theory and methods of Linear Algebra. To give the student a broad understanding of the numerical processes used in solving Linear Algebra problems, and their extension to some nonlinear problems.


Prerequisites: MA4002

MA4005 - ENGINEERING MATHEMATICS T1
ECTS Credits: 6

Mathematics & Statistics

Rationale and Purpose of the Module: To review and reinforce the student's understanding of and problem solving skills in the areas of
* Multivariate and Integral Calculus and Differential Equations.
* The Laplace Transform and Fourier Series and their use in solving Ordinary Differential equations.
* Matrix Algebra and its application to solving systems of linear equations. Basic Linear Algebra. The numerical processes used in solving Linear Algebra problems, and their extension to some nonlinear problems.


MA4007 - EXPERIMENTAL DESIGN
ECTS Credits: 6

Mathematics & Statistics

Rationale and Purpose of the Module: To familiarise students with the theory and applications of experimental design. Introduce the concepts of orthogonal functions and
orthogonal arrays within experimental design.
To analyse the Japanese method of experimental design and to compare it with traditional (linear models) design.

**Syllabus:** Multiple Regression, Residual analysis leverage and influence points.

Analysis of variance: Expanding one, two factors in orthogonal polynomials. Estimation of factorial effect, resolution of variation. robust techniques.

Statistical Experimental Design: Screening, factors, level, responses, full and fractional factorials, composite design, orthogonal arrays, signal to noise ratio, blocking confounding and D-optimal design. Product Design, parameter design, tolerance design.

Evolutionary Operations, response surface methodology, steepest ascent, canonical forms and the use of graphical techniques to classify surfaces.

Prerequisites: MA4004

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**MA4113 - APPLIED BUSINESS MATHEMATICS**
**ECTS Credits: 6**

**Mathematics & Statistics**

**Rationale and Purpose of the Module:** This module contains the first half of MA4102 and of MA4103.

**Purpose:**
To introduce mathematical concepts and techniques, with applications in economics, finance and in business in general. To develop an appropriate foundation in mathematics for students from diverse mathematical backgrounds.

**Syllabus:** Review of algebra: fractions and rational expressions, linear equations and inequalities. Economic models: cost and revenue, supply and demand curves.

Simultaneous linear and quadratic equations (solved algebraically and graphically); applications to market equilibrium and break-even analysis.

Linear programming: plotting linear inequalities in two variables, feasible region, constrained optimisation; solving linear optimisation problems using the graphical method; applications to maximising profit/revenue, minimising cost etc.

Mathematics of finance: geometric sequences and series; applications to compound interest, present value, valuation of annuities and mortgages.

Matrices: definitions, matrix algebra: addition, subtraction, scalar multiplication, matrix product; determinants (2X2); matrix inversion; representing and solving linear systems using matrices.

Functions and their graphs: definition of a function (including function of several variables), combining functions, inverse functions; graphs of linear, quadratic, cubic polynomials; roots and factors; negative powers and rational powers.

Exponents and logarithmic functions: laws of exponents (indices) and logarithms; the number e; the exponential function and natural log function; graphs of exponential and natural log; applications to population growth and depreciation of capital.

Differential calculus: concept of continuity; small change, secant line, slope, tangent line, definition of derivative; differentiation from first principles (quadratics only); derivative as instantaneous rate of change: application to marginal cost and marginal revenue; power rule, derivative of negative powers, fractional powers, exponentials and logs; higher derivatives; the Product, Quotient and Chain Rules.

Curve sketching using calculus and business applications: increasing and decreasing functions, turning points: local maxima and minima, the Second Derivative Test, concavity, points of inflection.

Syllabus: Combinatorics: permutations, combinations and the binomial theorem.
Probability: Bayes theorem, conditional probability. Introduction to information theory.

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**MA4413 - STATISTICS FOR COMPUTING**
**ECTS Credits: 6**

**Mathematics & Statistics**

**Rationale and Purpose of the Module:** To introduce the student to probabilistic ideas through the medium of information theory.

**Syllabus:** Combinatorics: permutations, combinations and the binomial theorem. Probability: Bayes theorem, conditional probability. Introduction to information theory.


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**MA4601 - SCIENCE MATHEMATICS 1**
**ECTS Credits: 6**

**Mathematics & Statistics**

**Rationale and Purpose of the Module:** To introduce students to the fundamental concepts of calculus and linear algebra.

* To develop and integrate the basic mathematical skills relevant to science.

**Syllabus:** [Vectors:] definition; addition; components, resultant, position vector; scalar product; dot product and angle between vectors; cross product; simple applications in mechanics.

[Trigonometry:] basic definitions and relation to unit circle; basic formulae and identities; frequency, amplitude and phase.

[Linear equations:] solution of systems of linear equations by Gaussian elimination; examples with a unique solution, an infinite number or no solutions.

[Matrices:] Addition and multiplication; matrix inversion; simple determinants.

[Functions:] graphs and functions; polynomial and algebraic functions; curve-fitting; least-squares approximation (formula only); exponential and logarithmic; inverse function.

[Derivative and applications:] basic concepts: slope as rate of change; differentiation of sum, product, quotient; chain rule; derivative of standard functions; tangent and normal; higher derivatives; maxima and minima; applications to optimisation in science.
MA4603 - SCIENCE MATHEMATICS 3
ECTS Credits: 6

Mathematics & Statistics

Rationale and Purpose of the Module: To introduce students to the fundamental ideas of uncertainty through probability.

To develop skills in the use of these techniques through
actual case studies using statistical software packages.

To give students a clear understanding of the importance of statistical methods in their work.

To lay a good foundation for the stream of statistically oriented modules in the fourth year.

To introduce statistical inference through the concepts of estimation and hypothesis testing.

To develop and integrate the basic mathematical skills relevant to technology.


Prerequisites: MA4603

MA4617 - INTRODUCTION TO FLUID MECHANICS
ECTS Credits: 6

Mathematics & Statistics

Rationale and Purpose of the Module: Change of title for existing module MA4607 INTRODUCTION TO APPLIED MATHEMATICAL MODELLING IN CONTINUUM MECHANICS. Content remains the same. Update of prerequisite module and lab hour added.

To provide an introduction to the basic concepts of the mathematical modelling of fluid mechanics.

Syllabus: Continuum theory, balance of momenta, constitutive laws, elementary viscous flow, aerofoil theory, vortex motion, Navier-Stokes equations, very viscous flow, thin film flow, boundary layer theory.

Prerequisites: MS4404

MA6011 - CRYPTOGRAPHIC MATHEMATICS
ECTS Credits: 6

Mathematics & Statistics

Rationale and Purpose of the Module: To introduce the concepts of Number Theory that underpin cryptographic algorithm techniques and cryptanalysis and to develop skill in deductive reasoning. At the conclusion of the module a student should have the knowledge to handle the mathematics involved in public key cryptography and in the analysis of conventional key ciphers.


**MB4001 - ALGEBRA 1**
ECTS Credits: 6

**School of Education**

**Rationale and Purpose of the Module:** To promote understanding of the number systems and their properties. To develop an understanding of the fundamental concepts of Linear Algebra. To promote proficiency in selected techniques and applications.

**Syllabus:** Number: basic number concepts, laws, equations; Number systems: extensions from N to Z, Z to Q and Q to R, complex numbers C; Elementary number theory: Peano's axioms, mathematical induction, binomial coefficients, fundamental theorem of arithmetic; Equations: linear, quadratic, polynomial equations, solution by graphical and numerical methods; Matrices: matrix algebra, applications.

**MB4005 - ANALYSIS**
ECTS Credits: 6

**Mathematics & Statistics**

**Rationale and Purpose of the Module:** To develop an understanding of formal methods of mathematical analysis, as applied to sets, real numbers, and general topology.

**Syllabus:** Set theory: equivalence classes of sets, cardinal numbers, countability and uncountability, including the uncountability of R. Functions of a real variable: limits, continuity and differentiability from first principles. Multivariate functions: inverse function theorem, implicit function theorem. Complex functions: differentiability and Cauchy-Riemann equations.

**MB4017 - GEOMETRY**
ECTS Credits: 6

**School of Education**

**Rationale and Purpose of the Module:** Recent changes to the Teaching Council requirements mean that every teacher on entry to the profession of teaching must study at least 5 credits of Geometry, either Euclidean or non-Euclidean. At present, no such module is available in the University of Limerick and so it is critical that we provide this option for students so that they can complete their entire undergraduate, pre-service mathematics programme in-house.

Geometry is a core part of mathematics education and provides the basis for an introduction to rigorous mathematical reasoning. The study of geometry allows for student improvement in the area of logic, deductive reasoning and problem solving - all of which are skills that will benefit students in a range of other mathematical strands. Geometry is unlike pure mathematics modules in the sense that it has a wide range of practical applications. It is used, for example, in art, engineering, sport, construction, architecture, to name but a few. The literal translation of the word Geometry ("Earth Measure") serves to further highlight its applicability and this module will seek to highlight the relevance of the subject to all students undertaking it. As such, this module will share with students key mathematical concepts that underpin a lot of objects they see and use on a daily basis.

Finally, Geometry and Trigonometry now makes up one - fifth of the junior and senior cycle mathematics curricula which the majority of students who study this module will end up teaching. As such, it is critical that they are equipped with the skills needed to teach this topic for understanding. In order to do this they themselves need a solid grounding in the subject and need to understand the rationale behind the theorems and constructions that they will encounter in the mathematics classroom. This module seeks to provide them with this knowledge.

**Syllabus:** The syllabus will be broke up into 8 sections/chapter. These 8 sections are: Pythagoras, Congruences and Similarity, Circles and Angles, Trigonometry, Co-ordinates, Vectors and Symmetry, Spherical Trigonometry, Non Euclidean Geometry.
which will include keyboard harmony (vamping, chordal analysis and application, both aural and written), aural skills (transcribing tunes and songs, awareness of traditional forms and styles, sight reading and sight singing). It is important to emphasise that the orientation of this stream of multi-skill development will be towards the needs and realities of traditional Irish music and musicians but with a wider context in mind. Dancers will take Movement Awareness. This will include practical dance workshops to introduce some of the movement principles that inform other dance practices today. It will also include an introduction to techniques and practices designed to promote the release of tension in the body in order to facilitate greater ease of movement. It will also include an introduction to the use of visual imagery as a way to develop an understanding of the correct alignment in movement. Finally an introduction to supplementary practices used by dancers as part of their training eg. Yoga, Feldenkrais, Alexander technique and Pilates. Improvisation will be undertaken in practical workshops to introduce the concept of improvisation as a means of exploring movement possibilities and also expanding movement vocabulary. Improvisations will include working with movement themes, dramatic themes, props, text and visual stimuli.

Humanities

Rationale and Purpose of the Module: Development of the students' primary performance interest, whether instrumental, vocal or dance. Students will be encouraged to engage in a dynamic self-critical process conducive to development and related to the principle of a supportive practice. Also the development of musicianship and body-awareness skills.

Syllabus: This module is divided into two parts. The first is the development of the students' performance practice and will occur in the stylistic context most common to the performance practice of the student. However, tutors will begin to encourage students to look to other styles and repertoires current within a primarily Irish context. This will take place in the context of one-on-one classes and develops from the progress in Practicum 1a.

The second part of these modules will be related to performance skills and again this element will be divided into two separate streams for musicians and dancers. Musicians will take Keyboard Skills and Aural Training which will include keyboard harmony (vamping, chordal analysis and application, both aural and written), aural skills (transcribing tunes and songs, awareness of traditional forms and styles, sight reading and sight singing). It is important to emphasise that the orientation of this stream of multi-skill development will be towards the needs and realities of traditional Irish music and musicians but with a wider context in mind. Dancers will take Movement Awareness. This will include practical dance workshops to introduce some of the movement principles that inform other dance practices today. It will also include an introduction to techniques and practices designed to promote the release of tension in the body in order to facilitate greater ease of movement. It will also include an introduction to the use of visual imagery as a way to develop an understanding of the correct alignment in movement. Finally an introduction to supplementary practices used by dancers as part of their training eg. Yoga, Feldenkrais, Alexander technique and Pilates. Improvisation will be undertaken in practical workshops to introduce the concept of improvisation as a means of exploring movement possibilities and also expanding movement vocabulary. Improvisations will include working with movement themes, dramatic themes, props, text and visual stimuli.

Humanities

Rationale and Purpose of the Module: To broaden the base of performance skills of the students to include other instrumental, vocal and dance aspects of the tradition.

Syllabus: In this module students will be introduced to the practice of a broad range of instrumental, vocal and dance skills they will otherwise be unfamiliar with. Dancers and singers will not be required to undertake elements of this module that relate to their primary performance interest. Instrumentalists will be required to study an instrument apart from their main performance interest. Outside of these requirements students will pursue one hour of instrumental, dance and song classes per week (3 in all). This will be assessed through performance (50%) and continuous assessment (50%)

Also as part of this module, students will undertake ensemble work assessed continuously. Students will be encouraged to develop a creative approach to groupwork as well as develop the interpersonal and musical skills necessary for the successful function of an ensemble.

This module will be a development of progress made in Practicum 1b and Practicum 2b.

Humanities

Rationale and Purpose of the Module: The development of a final extensive performance.

Syllabus: In this module students, with relevant tutors and under the direction of course director, will design and undertake an extensive, hour long recital which will be representative of both their own stylistic interest but also a range of diverse music and/or dance styles (in the case of dance, two to three smaller performances over a similar number of days will be considered).

Humanities

Rationale and Purpose of the Module: The development of final extensive performance representative of performance fields studied but not central to the students performance practice.

Syllabus: In this module students, with relevant tutors and under the direction of course directors, will prepare and undertake a performance representative of the three areas of performance skills represented in the second performance stream & those not central to their performance practice. This performance will be at the end of the linked module in the next semester.

MD4007 - PRACTICUM 6A - MAIN PERFORMANCE INTEREST
ECTS Credits: 6

Humanities

Rationale and Purpose of the Module: The development of a final extensive performance.

Syllabus: In this module students, with relevant tutors and under the direction of course director, will design and undertake an extensive, hour long recital which will be representative of both their own stylistic interest but also a range of diverse music and/or dance styles (in the case of dance, two to three smaller performances over a similar number of days will be considered).

MD4017 - PRACTICUM 6B
ECTS Credits: 6

Humanities

Rationale and Purpose of the Module: The development of final extensive performance representative of performance fields studied but not central to the students performance practice.

Syllabus: In this module students, with relevant tutors and under the direction of course directors, will prepare and undertake a performance representative of the three areas of performance skills represented in the second performance stream & those not central to their performance practice. This performance will be at the end of the linked module in the next semester.
Assessment will be on that final performance and continuous assessment.

MD4021 - INTRO TO IRISH TRAD MUSIC AND DANCE STUDIES 1
ECTS Credits: 6

Humanities

Rationale and Purpose of the Module: This module is an introduction to the growing field of traditional music and dance studies and will give the student an overview of some of the important features of these traditions.

Syllabus:
Issues addressed in this module will be dance tune types and structure, English language song tradition, instrumentation, traditional music and dance in America in the first half of the twentieth century, the harp tradition to 1800, modern step dancing, ceili dancing.

MD4027 - IRISH TRADITIONAL MUSIC AND DANCE STUDIES 4
ECTS Credits: 6

Humanities

Rationale and Purpose of the Module: The development of a research project in the field of traditional music and/or dance studies.

Syllabus: In this module students will engage in a self-directed research project concerning an aspect of the music or dance tradition under the supervision of course directors. This will be assessed through two seminar presentations and an extensive written submission. This research project could have a performance orientation.

MD4031 - CONTEXTUALISING AND VOCATIONAL STUDIES 1
ECTS Credits: 6

Humanities

Rationale and Purpose of the Module: Contextualising and Vocational Studies 1
Popular Music and Dance Studies / Audio/Visual Technology.
This module has two strands with particular purposes - to contextualise interdisciplinary academic fields of popular music and dance studies and to introduce students to audio/visual technology theory and practice in order to begin to build upon such technical skills

Syllabus: In this module students will be introduced to the academic field of popular music and dance studies, examining popular music and dance movements, particularly those relevant to Irish traditions. They will also begin to consider the role of traditional artists as business people, competing in an international market.

MD4043 - PERFORMANCE STUDIES 3: INTRODUCTION TO RITUAL STUDIES
ECTS Credits: 6

Humanities

Rationale and Purpose of the Module: To introduce students to the academic discipline of ritual studies and its impact on performance and performance studies: to explore research methods developed in ritual studies which are relevant to the study of performance; to engage with the paradigm of ritual towards a creative and reflexive understanding of performance.

Syllabus: An introduction to ritual studies and its relevance to performance studies including ritual paradigms of theatre, musical performance, dance performance, social drama, play, sport, games, trance, shamanism, puppetry, masking, liturgy and rites of passage; the exploration of creative research methods generated from the use of symbolism in ritual and the development of nascent rituals.

MD4047 - PERFORMANCE STUDIES 5: INTERCULTURALISM AND PERFORMANCE / FYP
ECTS Credits: 6

Humanities

Rationale and Purpose of the Module: To introduce students to the discourse of global and intercultural performance including current research perspectives, ethical issues and performance practice as political engagement.


MD4053 - SOMATICS AND RITUAL PERFORMANCE 3
ECTS Credits: 6

Humanities
Rationale and Purpose of the Module: This module will provide each student with the opportunity to develop skills to research and develop an informed and intelligent approach to specific professional needs so they can develop healthy and sustainable practices in preparation for performance. It will also provide the opportunity to develop skills to create innovative new models for realising performance and increase their options for professional practice.

Syllabus: This module will provide each student with the opportunity to develop skills to research and develop an informed and intelligent approach to their specific professional needs so they can develop healthy and sustainable practices in preparation for performance; it will also provide the opportunity for students to develop skills necessary to explore and develop innovative models for realising performance and increase their options for engagement in a range of professional contexts.

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**MD4067 - VOICE AND DANCE SKILLS FOR PERFORMANCE 5**  
ECTS Credits: 6  
Humanities

**Rationale and Purpose of the Module:** The ability to select and design a programme which shows an understanding of technique principles and practices and their application to specific contexts will prepare students to develop skills and confidence to create innovative new models for realising performance; students will specialise in creating a project within a specific context and begin to focus on their preferred options for professional practice.

**Syllabus:** Students will be required to specialise in voice or dance, and through regular technique classes and workshops they will continue to study and practice the basic technical principles of both western and world dance and voice traditions; they will also study movement and voice analysis to increase their understanding of these practices.

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**MD4077 - REPETOIRE, IMPROVISATION AND COMPOSITION 5**  
ECTS Credits: 6  
Humanities

**Rationale and Purpose of the Module:** To support students to develop the understanding of the artistic and technical requirements necessary to develop and produce performances in a range of contexts and broaden their understanding of how to produce work as creative artists and performers in professional performance projects.

**Syllabus:** Students will be required to specialise in voice or dance, and will work under the direction of guest tutors and the course directors to design and produce a number of performance projects to be presented in a range of performance contexts, featuring the student’s own work in addition to the works from the repertoires they have studied; the performances will include solo and ensemble works.
**MD4083 - ETHNOMUSICOCOLOGY AND ETHNOCOREOLOGY THEORY AND PRACTICE**
ECTS Credits: 6

**Humanities**

**Rationale and Purpose of the Module:** This module is split into two parts. In the first the student will engage other students in a laboratory pace within their own discipline, mentored by faculty and tutors, to develop creative, collaborative work within and extending from their own disciplines and genre practices. The second half of this module is designed to facilitate 'cross-arts' exploration of creative practice as a core dimension of every Academy undergraduate's educational experience at the Irish Academy. Each student will chose a performance course, from a genre or approach outside of their disciplinary and genre focused stream, selecting from a pool of courses covering instrumental / dance tuition, music/dance ensemble, dance/music ensemble, dance/music composition and other available performing arts practices.

**Syllabus:** Students will be provided with written feedback according to BA Irish Music and Dance policy.

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**MD4091 - Irish World Academy Practicum C1**
ECTS Credits: 6

**Humanities**

**Rationale and Purpose of the Module:** This module focuses on students developing their artistic practice in an collaborative context while gaining embodied experience of other arts practices outside of their own genre and disciplinary specialties. The rationale for including a defined space for the engagement with performance practices unfamiliar to the student is to show the student different creativities structured by unfamiliar aesthetics, cultural context and modes of embodiment. The title of the module reflects the Irish World Academy tradition of presenting modules with an wide performance skills focus as 'practicum'. Such an approach is enabled by an embodied methodology that is critically engaged. The 'C' of the title is a reflection of the cross-genre content of the module.

**Syllabus:** This module is divided into two parts. The first is the development of the students' performance practice and will occur in the stylistic context most common to the performance practice of the student. The second part of this module will be related to performance skills pertinent to the specific music, song or dance practices of the student.

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**MD407 - ADVANCED ENSEMBLE**
ECTS Credits: 6

**Humanities**

**Rationale and Purpose of the Module:** This is a module for fourth year BA Irish Music and Dance Students who wish to develop their ensemble skills further and who show a propensity to do so in their assessment for module MD4016.

**Syllabus:** Students in this module will concentrate on developing their knowledge of ensemble skills taken from a number of musical contexts. These skills will be developed in the context of their own performance practices. Students will attend a number of lectures that engage a systematic examination of the musical processes involved in the creation of ensemble. Such processes will then be utilised in performance laboratory classes, which will result in a public performance, developed in the context of a reflective journal.

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**MD4097 - COMPOSITION AND ARRANGEMENT IN IRISH TRADITIONAL MUSIC 1**
ECTS Credits: 6

**Humanities**

**Rationale and Purpose of the Module:** To develop the students skills and knowledge of composition and arrangement in the idiom of Irish traditional music as it is performed contemporarily.

**Syllabus:** Students will examine the various ensemble practices in Irish traditional music in currency today. These practices will include traditional as well as more contemporary and fusion based styles of composition and arrangement. This examination will engage ethnomusicological issues of origin and creation as well as practices of record, transcription and reproduction. Students will also develop and synthesize their own arrangement and composition practices from those studied. Students will be provided with written feedback according to BA Irish Music and Dance policy.

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**MD4117 - PROFESSIONAL SKILLS / FINAL YEAR VOCATIONAL PROJECT**
ECTS Credits: 6

**Humanities**

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**MD4121 - INTRODUCTION TO VERTICAL DANCE AND WALL RUNNING**
ECTS Credits: 6

**Humanities**

**Rationale and Purpose of the Module:** The aim of this module is to introduce students to this core aspect of aerial dance. This module forms part of a suite of aerial modules designed to create an aerial dance strand within the MA Festive Arts programme. This responds to the demand for third level training in the field, combined with the management and research elements of the MA Festive Arts programme. The class combines the use of sit-harness and abseil equipment both against a wall and free-flying. The class begins with basic kit familiarisation and core stability, strengthening and preparation. It then progresses to basic orientation on different planes, building towards a more dynamic vocabulary. Students will also be taught repertoire from established company performances, as well as allowing student time for creative input.

**Syllabus:** The class combines the use of sit-harness and abseil equipment both against a wall and free-flying. The class begins with basic kit familiarisation and core stability, strengthening and preparation. It then progresses to basic...
orientation on different planes, building towards a more dynamic vocabulary. Students will also be taught repertoire from established company performances, as well as allowing student time for creative input.

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MD4131 - HIP-HOP-DANCE ELECTIVE 1
ECTS Credits: 6

Humanities

Rationale and Purpose of the Module: To provide students with the opportunity to become competent in hip hop dance so that they can develop the skills and confidence to work towards the creation of Hip-Hop compositions in a range of performance contexts, which will broaden their career options in Dance.

Syllabus: Over this elective, students will learn, in studio, the roots of Hip-Hop and its evolution from the streets of New York city in the 1970s. Emphasis will be placed on learning about roots of Hip-Hop through class participation and learning the choreography of these dances and origins. By utilizing contemporary chorographic techniques, dancers will create new works for performance.

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MD4141 - IRISH DANCE PERFORMANCE SKILLS
ECTS Credits: 6

Humanities

Rationale and Purpose of the Module: This elective will be offered to musicians and dancers whose performance practice is outside of the Irish dance tradition. It will add to their performance skill set and increase their versatility and dance competence. It also reflects the strengths of Academy faculty.

Syllabus: Development of good basics in Irish dance technique. Students will continue to develop basic Irish dance steps and movement patterns. Music /dance connection will also be explored. The following tune types will be among those used to teach Irish dance rhythm: Reel, jig, hornpipe, waltz and polka. Posture, turnout and footwork will be emphasised to give students a basic dance vocabulary which they can draw on. They will learn motifs suitable for soft shoe and more rhythmic hard shoe dancing.

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MD4207 - HIGH LONESOME: SOUNDS AND NARRATIVES OF COUNTRY MUSIC
ECTS Credits: 6

Humanities

Rationale and Purpose of the Module: This is an elective module for second, third or fourth year BA Irish Music and Dance. Students interested in issues of ethnicity and identity as imagined, expressed, and performed through the genre of Country music in Ireland and in the US. Understanding this genre as a vernacular tradition in its particular regional/national contexts will shed light on what is at stake for those who perform and consume country music.

Syllabus: Students will look at the phenomenon of country music, placing particular emphasis on connections between Ireland and America as manifest in the sounds and narratives of this genre. The course will involve gaining a greater understanding of the vernacular tradition(s) of country music (i.e. country music in Ireland), as well as more generally concerned with definitions of the genre and how and where these definitions hold up or break down under scrutiny. Focusing on `narratives of country music will involve looking at song themes and topics (such as loss and desire, myth of the West, the open road, etc), as well as inviting a greater understanding of the genre itself and the kinds of musical/historical/political/cultural pathways it has and continues to follow (spiritual dimension, ethnic profile, national characteristics, gender roles, song construction). Ultimately, students will concern themselves with the questions of how identity is imagined, constructed, maintained, and negotiated through sound, sentiment, and narrative song performance and its subsequent reception in historical and current contexts.

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MD6031 - MEDIA TECHNOLOGIES FOR PERFORMING ARTS & ARTS RESEARCH
ECTS Credits: 3

Humanities

Rationale and Purpose of the Module: To provide an introduction into current media technologies as they are used in the fields of performing arts, creative arts therapies, and arts research; to develop essential skills and fluency in these technologies in order to use them competently, creatively, and effectively in one’s own specific discipline.

Syllabus: Students will be introduced to the current media technologies in audio, video and stagecraft/soundcraft/lightcraft as pertinent to the programmes offering the course. Students will study and practise essential skills required to employ technology to create an audio/video project related to their field of study, using stagecraft/soundcraft/lightcraft where applicable.

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MD6041 - INTRODUCTION TO RITUAL STUDIES
Humanities

Rationale and Purpose of the Module: The purpose of this module is to equip students with a knowledge of the emergence and development of ritual studies as an interdisciplinary discourse drawing on anthropology, sociology, religious studies, ethnomusicology /ethnochoreology and performance studies. It also familiarises students with a variety of theoretical approaches to ritual including evolutionary, structural-functionalist, cultural-symbolist and performative understandings. This is grounded with reference to several case studies of ritual practice drawn from historical and cross-cultural practices.

Syllabus: This module provides an introduction to the emergence and development of ritual studies as an interdisciplinary discourse drawing on anthropology, sociology, religious studies, ethnomusicology /ethnochoreology and performance studies. It introduces studies to evolutionary, structural-functionalist, cultural-symbolist and performative theories of ritual. It also discusses a number of ritual case studies including historical and cross-cultural examples of ritual practice. The documentation of live rituals through ethnographic approaches including participant-observation will also be introduced.

MD6051 - INDEPENDENT STUDY 1
ECTS Credits: 3

Humanities

Rationale and Purpose of the Module: - To initiate self-directed study as a means of (1) deepening knowledge / expertise within a primary specialisation (2) developing skills and knowledge in a secondary area of specialisation (3) engaging in creative, cross-platform study / performance through a combination of a variety of areas. - To allow a variety of project presentation and negotiable assessment weighting, encouraging the student to propose a form of presentation most suitable to the project and the educational journey, as well as a form of assessment capable of accurately evaluating the outcomes.

Syllabus: This module offers students the opportunity to pursue self-directed learning of an academic or performance-based project, under the guidance of the course director and supervisor. The student may wish to use the module to pursue more specialised study in his / her area of study, or to access the other areas of expertise available at the centre. These currently include Ethnomusicology, Ethnochoreology, Music Education, Community Music, Music Therapy, Irish Traditional Music and Dance Performance, Classical String Performance, Contemporary Dance Performance, Ritual Chant and Song, Festive Arts, and other specialist research interests of faculty and doctoral researchers at the Irish World Academy.

MD6061 - INTRODUCTION TO SOMATICS
ECTS Credits: 3

Humanities

Rationale and Purpose of the Module: This module will ensure that students are educated in somatics practices that promote a healthy and mindful approach to movement. The continued development of an integrated mind/body approach will enable students to perform with greater efficiency and will minimize their risk of injury.

Syllabus: Students will attend workshops during which they will study how somatic practices can support them in developing an enhanced awareness of embodied movement. These workshops will be based on principles drawn from: Pilates, Yoga, Feldenkrais, Body-Mind Centering and T’ai Chi

MD6071 - WRITING AND THE DOCUMENTATION OF ARTS PRACTICE 1
ECTS Credits: 3

Humanities

Rationale and Purpose of the Module: The purpose of this module is to explore a variety of approaches to the documentation of artistic practices, with a focus on documentation through writing.

Syllabus: Students will explore a variety of approaches to the documentation of artistic practices, with a focus on documentation through writing. These include forms of documentation emerging from personal memory data, self observation and reflection, as well as the collection of data from external sources including mentors and artistic colleagues. Registers of writing including the poetic, narrative, chronological and critical will be investigated. The role and function of writing in the creative process will be interrogated through creative and critical engagement. Methodological frameworks for the documentation of practice including autoethnography and narrative inquiry will be introduced.

MD6081 - CRITICAL ENGAGEMENTS WITH IRISH TRADITIONAL MUSIC
ECTS Credits: 3

Humanities

Rationale and Purpose of the Module: To examine manuscript, printed, audio and visual sources of Irish traditional music. Students will engage trends in current research in the field of traditional music studies.

Syllabus: In this module students will examine writings on and sources of Irish traditional music to enhance their understanding of this tradition. They will critically engage with texts relevant to Irish traditional music studies and related fields.

MD6091 - PROFESSIONAL DEVELOPMENT FOR THE PERFORMING ARTS
ECTS Credits: 3

Humanities

Rationale and Purpose of the Module: This module is designed to provide an awareness of professional development skills and contexts central to developing a career in the arts. It introduces students to several key facets of planning, arts project management, and career development as part of their professional development.

Syllabus: This module provides students with an introduction to core skills and concepts relevant to the development of performing arts careers in the contemporary world. Key issues covered include project development, planning, communications and pitching, as well as collaborative work, legal structures for working individually or in groups, and fundraising.
MD6101 - INTERDISCIPLINARY IMPROVISATION  
ECTS Credits: 3

Humanities

Rationale and Purpose of the Module: To provide an overview of improvisational processes within the context of current dance and music practices. To introduce the students to a range of aesthetic and technical approaches to improvisation. To provide for students to research improvisational processes and to integrate and apply this knowledge in their own practice.

Syllabus: Students will attend a number of workshops in which music and dance faculty will demonstrate and explore improvisational processes and practices. Students will develop improvisational scores based on the materials presented.

MD6111 - COLLOQUIUM 1  
ECTS Credits: 3

Humanities

Rationale and Purpose of the Module: The purpose of this module is to encourage and facilitate postgraduate students to engage with a community of scholars and practitioners presenting their respective work, from a variety of disciplinary and performance practice perspectives, in a formal, large-scale and medium-scale colloquium/seminar context, drawing from in-house seminars including the Tower Seminar Series, Logos, and other seminars. Students will expand their knowledge from within and outside of their own specialisations, and will tacitly learn about presenting their own work in such a format.

Syllabus: This module will expose students to scholarship and performance practices from a wide variety of music and dance related disciplines, enabling students to broaden their perspectives on their own specialisation as well as experience presentations from scholars and performers in cognate disciplines. Students will be expected to attend five seminars from the various series offered in the Academy (Tower Seminar series and/or comparable events, as approved by participating programme coordinators). As a consequence, engage in self directed inquiry and independent study where they have come across a topic or research/performance approach that stimulates their own research practice.

MD6121 - FESTIVAL DEVELOPMENT AND PRODUCTION  
ECTS Credits: 3

Humanities

Rationale and Purpose of the Module: To provide students with a foundation in the issues surrounding festival production and sustainable development.

Syllabus: This module provides students with a foundation in the issues surrounding festival development and sustainability, covering a range of topics including events production, audience development, feasibility, public relations, media relations, fundraising, stakeholder and partnership development, security, local authorities, and health and safety.

Prerequisites: MU5081

MD6131 - INTRODUCTION TO LOCAL AND GLOBAL FESTIVITY  
ECTS Credits: 6

Humanities

Rationale and Purpose of the Module: To provide students with a contextual, cross-cultural understanding of festival, based on case studies of specific local, national and international festivals.

Syllabus: The aim of this module is to introduce students to key perspectives in the study of festivity and its dynamics in society, through an exploration of festival and festivity in different historical and geographical contexts. Through the exploration of case studies and key contextual readings, students develop conceptual, theoretical and methodological frameworks for the study and understanding of festivity in society.

Prerequisites: MU5091

MD6141 - RESEARCH AND DISCOVERY FOR FESTIVAL STUDIES  
ECTS Credits: 6

Humanities

Rationale and Purpose of the Module: To facilitate an understanding of methodologies and theoretical paradigms relevant to the study and performance of Western plainchant, drawing on both historical musicological and ethnomusicological approaches. To introduce Western plainchant from its beginnings until the later Middle Ages, exploring it in its historical, social, religious, liturgical, intellectual and aesthetic contexts. This will include an investigation of its origins and evolution; nature, materials, forms and styles in relation to function, date and place; written sources and their palaeography; notation (general concepts and features; notations of particular regions and periods; principles and techniques of transcription and editing).

Syllabus: This module lays the basis for important research and methodologies that relate to the performance practice of Western plainchant. It will introduce students to fundamental research tools in primary and secondary sources, bibliographic and referencing techniques, historical contextual knowledge, musical palaeography and semiotics. The methodological approach is presented as an interdisciplinary pursuit combining historical musicology, ethnomusicology,
MD6161 - IRISH TRADITIONAL MUSIC PERFORMANCE RESEARCH SEMINAR
ECTS Credits: 3

Humanities

Rationale and Purpose of the Module: This module will introduce students to current research in the area of traditional music studies. This research will be engaged through the critical assessment of current publications in the field, examining developments in the epistemology and phenomenology of current critical academic engagement with this historical artistic practice. The module will particularly examine the impact, real and potential, of these developments on the performance practice.

Syllabus: In this module students will study the history, theory and practice of Irish traditional music. They will be encouraged to use theoretical tools from a number of disciplines to enhance their understanding of this practice. They will examine publications and resources that examine Irish traditional music in an exemplary and innovative fashion.

MD6171 - FRAMING IRISH MUSIC: SOURCES AND DISCOURSES 1
ECTS Credits: 9

Humanities

Rationale and Purpose of the Module: The purpose of this module is to explore the printed, manuscript, and audio-visual sources of Irish Music, and to examine the main discourses around this music over the past three centuries. This module is one of six offered by the Irish World Academy as part of a Joint PhD in The Anthropology of Irish Music coordinated with the Keough Naughton Institute of Irish Studies, University of Notre Dame.

Syllabus: By means of a systematic examination and analysis of printed, manuscript, and audio-visual sources of Irish Music (including Dance), as well as an investigation of the central discourses surrounding the music, this module opens up the origins of the music alongside its conceptual articulation both by the music performers themselves as well as by the rapidly increasing integration of this music within an academic context.

MD6181 - SONGWRITING STYLE AND CONTEXT 1
ECTS Credits: 3

Humanities

Rationale and Purpose of the Module: In this module students explore songwriting, songwriters and repertoires and the creation of meaning and the construction of identity through songwriting and performance. Students consider various cultural, economic, social, political and historical contexts, focusing particularly on issues of genre.

Syllabus: The many processes involved in songwriting are examined across a range of genres, cultures and epochs, engaging with exemplary songwriters, repertoires and practices, within their cultural, economic, social, political and historical contexts.

Students engage with the multiple ways in which song style and performance practice develop in response to shifting social, economic, political and artistic conditions.

The module examines how these act as important identity markers for communities of practice, and how songwriters negotiate the representation and dissemination of image and songs as commercially mediated products or commodities.

MD6191 - SONGWRITING PROCESS 1
ECTS Credits: 12

Humanities

Rationale and Purpose of the Module: In this module students explore the creative process of songwriting and develop the skills to produce a body of work for performance and / or recording in a supportive, reflective environment. With the guidance of the course director and songwriting faculty, students hone skills and strategies in writing song lyrics, composing song melodies and creating song arrangements. Students also develop skills in reflective practice/critique. On completion of this module, students have developed a heightened awareness of their own creative voice, a demonstrable body of work to add to their songwriting portfolio and a wider repertoire of songwriting skills and creative strategies to draw from.

Syllabus: This module provides students with opportunities to engage with a variety of approaches to songwriting, helping them to better understand and locate their own artistic practice. Students develop their skills in lyric writing and in music arrangement and composition. Students develop a body of work for recording and/or performance through a combination of one-on-one mentoring with their creative mentor, performance-based seminars with visiting artists and collaborative workshops with their peers.

MD6201 - INSTRUMENTAL SKILLS FOR SONGWRITERS
ECTS Credits: 3

Humanities

Rationale and Purpose of the Module: This module develops the instrumental skills of the songwriter appropriate to their songwriting and performance practices.

Syllabus: Songwriters develop instrumental skills that enhance the creative process of songwriting, improve their ability to accompany themselves or other performers in the performance of their songs, and develop their ability to demonstrate their creative ideas with a musical instrument.

MD6211 - IRISH WORLD ACADEMY ENSEMBLES
ECTS Credits: 3

Humanities

Rationale and Purpose of the Module: This module provides students with the opportunity to rehearse and perform with one of the Irish World Academy’s existing performing ensembles. Through participation in collaborative music making with members of the wider community of musicians at the Irish World Academy, songwriting students broaden their own practice as musicians and their perspectives as writers and performers. Students develop cross-cultural understanding of diverse music repertoires, greater confidence as performers, and build musical relationships
through their membership of their chosen ensemble.

Resources for each individual ensemble are provided in class by the relevant ensemble leader.

**Syllabus:** Students choose to participate in one ensemble from the Academy’s diverse range of music ensembles. Ensemble options include (but are not limited to): Vocal Ensemble, Gospel Choir, Chant Ensemble, Irish World Academy Choir, Gamelan Orchestra. Students learn ensemble-specific repertoire and performance practices through attendance at weekly rehearsals and participation in ensemble performances.

MD6221 - APPLIED MUSIC THEORY FOR SONGWRITERS
ECTS Credits: 3

**Humanities**

**Rationale and Purpose of the Module:** In this module students develop applied music theory skills appropriate to the practice of songwriting. Students build competencies and vocabulary in music literacy, harmony and other relevant aspects of music theory. Students also develop skills in sight-singing, keyboard practice and other instrument-specific practices. This module is elective for students of MA Songwriting and open to other IWAMD MA students with a particular interest in songwriting.

**Syllabus:** Students develop their knowledge of theoretical aspects of music and learn to apply this knowledge in their own song composition and performance practices. Students analyse important stylistic aspects of musical language and grammar, including form, melody, rhythm, harmony, chords, part-writing and ensemble textures. Students improve their music literacy by developing listening skills and their ability to sight-sing and sight-read at the keyboard and on their own instrument.

MD8011 - CREATIVE PROCESS 1
ECTS Credits: 6

**Humanities**

**Rationale and Purpose of the Module:** The aim of this module is to explore the creative process in artistic and academic work with a view towards investigating resonance, dissonance and synchronicity between method in one’s performance practice and the investigation of specialist research project.

**Syllabus:** This module addresses basic questions concerning the design and framing of a research project, including ways of framing research questions, the relationships among theory and practice in research, research ethics and issues of representation in ethnographic writing. It also addresses hands on questions concerning the practice of qualitative research, ethnographic fieldwork and field based research methods, the interview process, bibliographical and other resources, documentation and writing strategies. It purposely crosses boundaries between creative process in the arts and sciences in ways appropriate to our population of scholar/artists and research/practitioners. Its subject, then, is research methodology as reconceived for this practice-research programme. Work in this module is explicitly multi-modal in character. Teaching faculty will address, among other topics, challenges facing students doing arts practice research, ethnographic methods in dance, music and performance research, analytical tools for dance, music and performance artists; examination of the role and function of writing and its further integration as a generative strand of the process of invention; what research structure (apparatus) can provide for the crossing of thresholds between the studio-based and text-based strands of arts-practice research.

MD8021 - IWA SPECIALIST ELECTIVE 1
ECTS Credits: 12

**Humanities**

**Rationale and Purpose of the Module:** The aim of this module is to facilitate the development of specialist skills, relevant to the research project, through the design of a self-direction programme of study which may integrate performance, composition, choreography, academic writing and collaborative work.

**Syllabus:** This module comprises a programme of self-directed learning which is created to facilitate the development of the research programme. It is designed by the student in consultation with his/her supervisor and supervisory panel and may include performance, composition, choreography, academic writing and collaborative work.

MD8013 - IWA SPECIALIST ELECTIVE 3
ECTS Credits: 12

**Humanities**

**Rationale and Purpose of the Module:** The aim of this module is to introduce students to a variety of theoretical perspectives on arts practice research, towards the development of a framework suited to the specialist needs of individual research questions.

**Syllabus:** This module is geared primarily towards the theorising of research problems in an area of study in which practice cannot be easily distinguished from theory. The course is designed as an active meditation of the paradoxes inherent in theorising performance in which students draw on their lived-experience as artists to make the texts meaningful. Through historical readings students will become familiar with the traces left by scholar-performers in the past who have written on this relation. Keywords and concepts will be addressed such as aesthetics, agency, embodiment, everyday life, festival, gender, heritage, identity, liveness, narrative, performance art, performativity, play, poetics, race, representation/mimesis, ritual, spectatorship. Topics proposed for this seminar by current faculty include: the broad spectrum approach to performance, music and dance as social life, the intersection between performance and ritual, concepts and issues in music/dance practice from ethnomusicological perspectives, the artist in a globalised world i.e. the relationships among local arts/global lives and global arts/local lives, what are the implications, for arts practice research, of the privileged status of writing in theory production in the academy, examining the concept of disciplinary-mastery in arts practice.

MD8001 - ARTS PRACTICE RESEARCH 1
ECTS Credits: 6

**Humanities**

**Rationale and Purpose of the Module:** The aim of the module is to develop specialist skills, relevant to the research project, through the design of a
self-direction programme of study which may integrate performance, composition, choreography, academic writing and collaborative work.

Syllabus: This module comprises a programme of self-directed learning which is created to facilitate the development of the research programme. It is designed by the student in consultation with his/her supervisor and supervisory panel and may include performance, composition, choreography, academic writing and collaborative work.

**MD8041 - CREATIVE PROCESS AND IMMERSIVE PRACTICE 1**
ECTS Credits: 9

**Rationale and Purpose of the Module:** The purpose of this module is to support students to explore their creative process in an immersive practice as a means of enhancing their creative experience, practice and research through interaction with artists, mentors and creative practitioners; participation in key artistic events and visits to relevant organisations / institutions including international arts festivals; opportunities to share work in the students’ own creative media; scholarly engagement with theories of creativity; critical reflexive writing and documentation of one’s own artistic practice and experiences on the module.

**Syllabus:** This module is constructed, delivered and assessed to encourage students to explore their creative process in artistic practice. Through a combination of artistic and scholarly activities, it aims to provide multiple opportunities and approaches towards a reflexive engagement with the students’ own creative practice. The work of the module is multi-modal in character and includes postgraduate seminars on creativity and creative process methodologies including arts practice research, ethnography, autoethnography and narrative inquiry; personal reflections on creative process from internationally recognized artists and creative practitioners and artistic immersions in a number of identified arts events / venues including international arts festivals and performances. The module will combine discussion-based seminars, site specific artistic experiences / venue visits / conversations / participation, peer learning and mentoring. The module intends to support students in the development and realization of a portfolio of reflexive work documenting their creative process and reflections on their artistic practice.

**ME4001 - INTRODUCTION TO ENGINEERING 1**
ECTS Credits: 3

**School of Engineering**

**Rationale and Purpose of the Module:** To introduce the profession of engineering, develop non-technical skills such as report writing, encourage a spirit of research and self-study, develop students knowledge of the use of engineering units.

**Syllabus:** Overview of the engineering disciplines currently being offered by the Mechanical and Aeronautical Engineering department: The profession (Mechanical, Aeronautical, Biomedical, Design), real-life engineering examples, skills required, career opportunities and career progression. Materials used in engineering products, alloys of iron, steel and aluminium, ceramics, polymers, composites; materials specific to biomedical and aeronautical applications. Ethics in engineering; report writing including information sources, plagiarism; units and error analysis; problem solving techniques; time management; sustainability; intellectual property rights and the patent process.

**ME4011 - CONTROL ENGINEERING**
ECTS Credits: 6

**School of Engineering**

**Rationale and Purpose of the Module:** To provide a fundamental understanding of:-
Principles and techniques of measurement
Characteristics of instruments and instrumentation systems
Principles and elements of feedback control systems.
Block diagram analysis and dynamic behaviour of 1st order systems
Automatic control engineering

**Syllabus:**
1. Sensors, transducers and transmitters
2. Instrument specification
3. Standard instrumentation signal levels
4. Signal transmission
5. Dynamic errors

**ME4021 - ENGINEERING IN THE AVIATION INDUSTRY**
ECTS Credits: 3

**School of Engineering**

**Rationale and Purpose of the Module:** This module has two linked purposes. Firstly, to introduce students to the practice of the engineering profession in the various fields of the aviation industry: aircraft design and manufacturing, maintenance and airworthiness management, operations and supply - logistics support. Secondly, to develop critical thinking and research, presentation, communication and teamwork skills important for an engineering career in the aviation industry. The vehicle for bringing these two goals together is a group project.

**Syllabus:** Historical evolution of aviation safety in worldwide level: from military to civil aviation, technology and safety regulation, safety culture and education, the role of engineers; Overview of the aviation industry: aircraft manufacturers and design organisations, maintenance and repair service providers, logistics and supply support, regulatory bodies, operators (commercial aviation, general aviation, state aircraft operators; defence forces), aviation training. Overview of the engineering practice in the aviation industry: working within a regulated environment, real life engineering examples, skills required, career opportunities and progression; Engineering sustainability in aviation: environmental and financial considerations and requirements, optimising flight, ground and maintenance operations for sustainability, advanced materials for aircraft weight (fuel burn) reduction, transitioning from the metal to composite...
aircraft structures.
Group research Project 'Meeting the challenges of tomorrow': researching an emerging challenge in the aviation industry, oral presentation techniques, digital communication in a professional setting.

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**ME4037 - ADVANCED MECHANICS OF SOLIDS**
*ECTS Credits: 6*

**School of Engineering**

**Rationale and Purpose of the Module:** To analyse stresses and strains in 2D and 3D in an elastic body subjected to various loading conditions. To analyse stresses and strains in uniaxial, biaxial and axisymmetric stress fields for elastomers. To understand how to apply stress functions to problems in bending, contact stress and pure shear. To use numerical techniques combined with experimental analysis for the solution of complex problems.


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**ME4047 - FUELS AND ENERGY CONVERSION**
*ECTS Credits: 6*

**School of Engineering**


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**ME4057 - AEROSPACE METALLIC MATERIALS**
*ECTS Credits: 6*

**School of Engineering**

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**ME4111 - ENGINEERING MECHANICS 1**
*ECTS Credits: 6*

**School of Engineering**

**Rationale and Purpose of the Module:** To enable students to achieve fluency and confidence in the application of Newton’s Laws of Motion to particle and rigid body mechanics problems in which the bodies are in static equilibrium. In particular to become proficient in the use of Free Body Diagrams.

**Syllabus:** Application of Newton's Laws to particles and rigid bodies in equilibrium (Statics); equivalent force systems; two-and-three-dimensional force systems in equilibrium; analysis of rigid trusses and frames; centroids, centres of gravity, distributed forces, area and mass moments of inertia; friction.

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**ME4117 - VIBRATION ANALYSIS**
*ECTS Credits: 6*

**School of Engineering**

**Rationale and Purpose of the Module:** To develop an understanding of the role of vibration analysis in structural design. To apply the techniques of modal analysis and the finite element method to solve structural vibration problems.


**Prerequisites:** ME4112

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**ME4227 - AIRCRAFT STRUCTURES**
*ECTS Credits: 6*

**School of Engineering**

**Rationale and Purpose of the Module:** Module builds on the Mechanics of Solids 2 module by providing further skills in the analysis of stress, strain and deformation of aircraft structures.

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**ME4213 - MECHANICS OF SOLID 1**
*ECTS Credits: 6*

**School of Engineering**

**Rationale and Purpose of the Module:** To analyse stresses and strains in a uniaxial stress field and stresses in a bi-axial stress field. To understand how to evaluate stresses in a cylindrical beam subjected to point loads, uniformly distributed loads, couples and torques. As (2) for beams of symmetrical section without torsion. To understand the significance of the connection between the elastic constants. To understand the approach to the analysis of statically indeterminate problems.

**Syllabus:** Uniaxial stress and biaxial strain fields. Constitutive relations. Shear force and bending moment diagrams. Bending of beams, Transverse shear stress in beams, Composite beams, Thermal stress, Torsion of cylindrical sections, Analysis of stress at a point in 2D, Principal stress and Mohr’s stress circle, Thin cylinders and thin spherical vessels.

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**ME4112 - ENGINEERING SCIENCE 1**
*ECTS Credits: 6*

**School of Engineering**

**Prerequisites:** ME4616, ME4226

**ME4307 - BIOMATERIALS 1**  
ECTS Credits: 6

**School of Engineering**

**Rationale and Purpose of the Module:** Review understanding of biological systems; To gain appreciation for soft tissue replacement materials in current use; To enable the student to understand materials selection and design requirements for soft tissue replacement applications.


**ME4417 - BOUNDARY LAYER THEORY**  
ECTS Credits: 6

**School of Engineering**

**Rationale and Purpose of the Module:** To advance the knowledge of the students of fluid flow, aerodynamics and convective heat transfer

**Syllabus:** The Derivation of the Three-Dimensional Viscous, Steady, Compressible Equations of the Conservation of Mass, Momentum and Energy.

**Prerequisites:** ME4412

**ME4424 - AERODYNAMICS 1**  
ECTS Credits: 6

**School of Engineering**

**Rationale and Purpose of the Module:** To give the student a comprehensive understanding of incompressible flow together with an introduction to compressible flow with application to aircraft.

**Syllabus:** Review of governing equations, application of equations to fluid flow processes
Thin aerofoil theory, aerodynamic coefficients
Finite span wings, lifting line theory, vortex flow, induced drag, downwash, lift distribution
Boundary layer separation and control
Compressible flow, normal and oblique shock waves, aerofoils in compressible flow
Introduction to experimental techniques

**Prerequisites:** ME4412

**ME4438 - COMPUTATIONAL FLUID DYNAMICS**  
ECTS Credits: 6

**School of Engineering**

**Rationale and Purpose of the Module:** To provide the students with a fundamental understanding of the theory and application of computational fluid dynamics (CFD) as implemented by the finite volume technique.

**Syllabus:** The Derivation of the Three-Dimensional Viscous, Steady, Compressible Equations of the Conservation of Mass, Momentum and Energy.

**Prerequisites:** ME4412

2. To provide the students with a working knowledge of a commercial CFD code via practical computer laboratory sessions.

**Syllabus:** The philosophy of CFD; fundamentals of vector fluid dynamics; fundamentals of viscous fluid deformations; the governing equations of fluid dynamics; basic discretisation and grid generation techniques; the finite volume method; application to convection-diffusion problems; pressure-velocity coupling; implementation of boundary conditions; fundamentals of turbulence modelling.

**ME4517 - ENERGY MANAGEMENT**  
ECTS Credits: 6

**School of Engineering**

**Rationale and Purpose of the Module:** To provide an understanding of the requirements for, and the methods of, energy management as applied to a variety of engineering systems.


**Prerequisites:** ME4526, ME4516

**ME4523 - THERMODYNAMICS 1**  
ECTS Credits: 6

**School of Engineering**

**Rationale and Purpose of the Module:** To introduce the First and Second Laws of Thermodynamics and to apply these laws in the analysis of basic engine cycles

**Syllabus:** First law of Thermodynamics with applications to non-flow and to steady flow processes. General Thermodynamic relationships and properties. Statements of the Second Law of Thermodynamics

ME4611 - COMPUTING
ECTS Credits: 6

School of Engineering

Rationale and Purpose of the Module: To provide the student with a good knowledge of structured program design for engineering applications

Syllabus: Introduction to computer organisation, programming languages, top-down design techniques; arithmetic operations including intrinsic functions; control structures; data files and input/output system; single and multidimensional array processing; implementing top-down design with functions and; character, and complex data; data files; numerical applications; and engineering applications. Plotting functions. Use of Microsoft Outlook.

ME4616 - FINITE ELEMENT ANALYSIS
ECTS Credits: 6

School of Engineering

Rationale and Purpose of the Module: To develop an understanding of the underlying concepts of FEA. To be able to apply the method to problems in solid mechanics and heat transfer.


ME4714 - INSTRUMENTATION AND CONTROL
ECTS Credits: 6

School of Engineering

Rationale and Purpose of the Module: To give students a practical overview of industrial control systems, and their application to discrete part manufacturing, batch and continuous processes, and to provide specific exposure to the application of Programmable Logic Controllers in manufacturing and process environments

Syllabus: * Introduction to control systems and automation
  * Programmable Controller's hardware and software.
  * Control program development.
  * Sequential control.
  * Interfacing external devices.
  * PLC Communications.
  * PLC Applications.
  * Selection, installation and commissioning of PLC systems.
  * Supervisory computer control.
  * Sampling and filtering of continuous measurements.

ME5031 - DESIGN METHODOLOGY
ECTS Credits: 6

School of Engineering

Rationale and Purpose of the Module: To introduce the student to the concept and practice of a structured approach to engineering design. The student will be exposed to design philosophy, methodology and management bringing him through from problem definition and specification to finished engineering drawings. Engineering drawing forms a backbone to the Module through use of freehand orthographic drawing, isometric and realistic sketching, rendering and structured manual drawing techniques.

Syllabus: [Responsibilities of the Designer. (Social, Legal, Environmental and Technical)] [Structured Design Methodology.] Problem / Market Research and Problem Definition; Specification Development; Concept Origination / Development; Concept Evaluation and Rationalisation; Decision Making Techniques; Design Tightening; Detail Design Considerations and Practice. [Design Recording and Presentation Techniques.] Data Recording using Freehand and Orthographic Sketching; Concept Development and Presentation; Rendering Techniques; Modelling Technology and Practice. Design Layout / Workout Drawings. ; [Engineering Communications] Assembly Drawings and Structured Parts Lists / Materials Schedules; Manufacturing Considerations and Production Planning Constraints

Prerequisites: ME4611, PE4112

ME6001 - FUNDAMENTALS OF CONTINUUM MECHANICS
ECTS Credits: 6

School of Engineering

Basic concepts and definitions: Concept of a continuum, continuity, homogeneity and isotropy; Elements of vector and tensor algebra. Deformation and flow: Length and angle changes: Strain tensor; Material and Eulerian description; Deformation rate tensor Stresses: Body and surface forces; Stress tensor; Principal stresses, Stress invariants, Hydrostatic and deviatoric stresses. Fundamental laws of continuum mechanics: Mass conservation, Newtons laws, Conservation of energy. Constitutive relations: Ideal materials; Constitutive relations and equations of state; Elastic solids; Newtonian fluids Mathematical models: Linear elastic solids; Newtonian fluids; Initial and boundary conditions. Introduction to the Finite Element method: Principle of virtual work; Finite element discretisation; Linear elastic finite-element model; Shape functions; Numerical quadrature; Mapping of elements; Solution of the finite-element equations.
ME6051 - ADVANCED TECHNICAL COMMUNICATION FOR ENGINEERS  
ECTS Credits: 3

School of Engineering

Rationale and Purpose of the Module: To develop knowledge of the basics of impact damage, to give a broad understanding of principles and techniques of composite stress analysis, strength and service durability predictions of composite aircraft structures, to develop knowledge of the basics of impact damage, damage tolerance in composite aircraft structures. 


MG4031 - MANAGEMENT PRINCIPLES  
ECTS Credits: 6

Management and Marketing

Rationale and Purpose of the Module: This module is designed to provide a comprehensive introduction to the area of management. It introduces students to key managerial issues and wider environmental factors affecting organisations.

Syllabus: Management concepts and evolution, the development of Irish business, the global business environment, functions of management, planning, decision making, organising, staffing, leading, motivating, controlling.

MG4035 - INTERNATIONAL MANAGEMENT  
ECTS Credits: 6

Management and Marketing

Rationale and Purpose of the Module: The rationale for this module is to provide students with a thorough appreciation of managing organisations internationally, along with an understanding of the different trajectories of current International Management thinking. The module is dedicated to answering four core questions which focus on developing skills for operating in an international environment;

1). What is international management and what complexities arise when operating at the international level?
2.) How do we understand differences between countries when managing internationally, and what are the
implications of these differences for international managers?
3.) What is the most appropriate way for firms to internationalise, and to manage and structure their activities?
4.) How can we develop the managerial talents and capabilities to ensure that managers can be a success internationally

Syllabus: Introduction to International Management- definitions and key concepts; Country Competitiveness, Globalisation & the MNC; Political and Legal Determinants of International Management; Cultural Determinants of International Management and cross cultural perspectives of management practice, convergence, divergence and crossvergence; Firm Internationalisation - Entry Strategies, Structures and the role of alliances and joint ventures; Global Leadership competences; International Assignment Cycle and repatriation.

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MI4007 - BUSINESS INFORMATION MANAGEMENT
ECTS Credits: 6

Management and Marketing

Rationale and Purpose of the Module: To illustrate the implications of viewing the organization as an information processing entity
To enable students to create and manipulate data and information for managerial reporting.
To highlight the social and economic theories underlying the development and use of information and knowledge in modern business.
To make students aware of the challenges of the opportunities and challenges of information in a global context.

Syllabus: This course will introduce the student to information as a corporate resource; to the firm as an information processing entity; to the types of business systems platforms in support of managerial and executive-level decision making and the coordination of business processes. It will show information management in the functional areas of business: accounting, marketing, human resources, operation. It will provide an economic and social framework for understanding the nature and interaction of information, technology, people, and organizational components; the role of the Internet and networking technology in modern organization; the evolution of e-business and the transformation of organizations and markets; business systems as both constraining and enabling organizations; the relationship between business systems and an organizations social structure; information and knowledge as a strategic resource in organizations.

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MG4045 - CHANGE MANAGEMENT
ECTS Credits: 6

Management and Marketing

Rationale and Purpose of the Module: 1. To enable students to gain a deeper understanding of organisational reality through the different levels and perspectives of change inside and outside the organisation.
2. To develop a deep appreciation of the inter-relationship between routines and change in terms of structure, culture management intervention and modes of reinforcement.
3. To actively engage students to develop skills in proven approaches to managing change and crises in both for-profit and not-for-profit organisations.
4. To enable students to gain a deeper understanding of the challenges and complexity of international change management.
5. To give students a deep appreciation of the organisational and environmental roadmap of change.

Syllabus: Nature of organisational change, resistance to change, understanding attitudes and behaviours towards change, managerial skills of change agents, problems facing change agents, levels of organisational change, formation of implementation paths, mobilising for change, change levers and interventions, strategic change frameworks, monitoring, control and resourcing change, evaluating change, crisis management, management of stakeholders in change and crisis management.

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MK4007 - APPLIED MARKETING 1
ECTS Credits: 6

Management and Marketing

Rationale and Purpose of the Module: It specifically focuses upon the development of research skills which are fundamental to understanding and undertaking marketing activities
1. To build upon theoretical frameworks introduced in marketing intelligence
2. To develop marketing research skills that can be applied to range of marketing contexts (e.g. sales, advertising, NPD, customer satisfaction)
3. To equip students with the skills necessary to; develop research instruments, conduct fieldwork and data analysis/ interpretation and present research findings.
4. To encourage and support effective team work and project management

Syllabus: The marketing research skills will be fostered through management of an extensive student project: Developing research objectives (e.g. problem definition); Research design and creation of research proposal; Collection, interpretation and analysis of secondary research; Collection, interpretation and analysis of primary research; Research presentation.

Prerequisites: MK4002

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MK4017 - MARKETING LEADERSHIP
ECTS Credits: 6

Management and Marketing

Rationale and Purpose of the Module: This module aims to underline the strategic importance of marketing. To this end, it aims to investigate the relationship between marketing and the other functional areas within the business. Further, it seeks to delineate the nature of the marketing management process and to explore the role of marketing planning. Finally, the module attempts to critically evaluate the marketing vision.

Syllabus: The module addresses the marketing vision and suggests how the marketing planning and management process contribute to and deliver upon such a vision. Next the module addresses the relationship between marketing and the other functional areas, and assesses the role of marketing in the boardroom. The module also considers value-based marketing and the application of marketing techniques internally within the organisation's marketing. As such the module will critically consider the potential for organisational renewal through marketing.

Prerequisites: MK4002

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MK4025 - MARKETING COMMUNICATIONS  
ECTS Credits: 6  

Management and Marketing  

Rationale and Purpose of the Module: To introduce students to communications theory.  
To establish the fundamentals of marketing communications.  
To explore the nature and influence of the institutions of consumer culture  
To consider different marketing communications techniques and be cognisant of contemporary trends in the field.  
To investigate alternative understandings of advertising.  
To demonstrate how different communications techniques can be combined and interrelated to form the basis of positive international marketing communication strategies.  
To appreciate the impact which marketing communications have on our lives.  

Syllabus: Role of communications, communications theory, audiences, how advertising works, the management of marketing communications, the advertising industry, creative aspects of advertising, media aspects of advertising, ethics and advertising standards, communication vehicles (sponsorship, public relations, direct marketing, consumer sales promotions, trade shows and exhibitions, internet marketing communications tool, internal marketing communications), integrated marketing communications, the planning and management of an integrated marketing communications plan, the effects and effectiveness of marketing communications, future developments in marketing communication.

MK4035 - MARKETING RESEARCH  
ECTS Credits: 6  

Management and Marketing  

Rationale and Purpose of the Module: The module specifically focuses upon the development of applied research skills which are fundamental to understanding and undertaking marketing activities. The purpose of the module is:  
* To expose students to different methodologies used by marketers.  
* To develop marketing research skills that can be applied to a range of marketing contexts (e.g. sales, advertising, NPD, customer satisfaction).  
* To equip students with the skills necessary to; develop research instruments, conduct fieldwork and data analysis/interpretation and present research findings.  
* To encourage and support effective team work and project management.  
The module is thus designed to enhance students' applied skills (integration of theory and practice) before they embark on their co-op placement.  
* To promote critical reflection on the nature of information, the integrity of it and the application of a systematic and disciplined approach to information gathering.  

Syllabus: The marketing research skills will be fostered through management of an extensive student project:  
Developing research objectives (e.g. problem definition);  
Research design and creation of a research proposal;  
Consideration of the ethical implications of the research;  
Collection, analysis and interpretation of secondary data;  
Collection, analysis and interpretation of primary data;  
Research presentation.  

Prerequisites: MK4002  

MK4045 - DIGITAL MARKETING  
ECTS Credits: 6  

Management and Marketing  

Rationale and Purpose of the Module: Digital marketing platforms have changed how businesses connect and communicate with customers. The technology now available to consumers has radically altered their consumption patterns. These new behaviour patterns have created significant challenges and opportunities for marketers. This module gives a background of the rapidly changing marketing practice within the context of digital marketing and online social networks. Students will understand the magnitude of digital and social media and how to apply it to within Business-to-Consumer (B2C) and Business-to-Business (B2B) markets. Students will learn about cutting-edge digital marketing concepts, techniques and strategies used within industry. Furthermore students will understand how to leverage mobile and location-based technology for marketing purposes. After this module, from a practical perspective the student will be capable of developing and managing digital marketing campaigns.  

Syllabus: Introduction to Digital Marketing Theory; Consumer Behaviour and Digital Media; Online Identities; Evolution of Digital Marketing Landscape; Understanding Business-to-Consumer (B2C) and Business-to-Business (B2B) marketing in this new landscape; Social Media & Content Marketing Platforms (Social Networks, Discussion Boards, Blogging, Micro-Blogging, Widgets, Crowdsourced Content, Social Curation, Social Marketplaces, Wikis, Social Bookmarking); Search Engine Marketing; PPC Advertising; Search Engine Optimisation; Email Marketing Campaigns; Website Analytics; Building a Digital Brand; Typologies of Online Brands; Digital Products & Freemium Business Model; Online Communities Creation and Curation; User Generated Content & Co-Creation; Mobile and Location-based Marketing; Content Marketing Development, Online PR & Reputation Management; Planning a Social Media Campaign; Impact of Gamification; Word of Mouth and Viral Marketing; Social Media Metrics; Monitoring, Measuring and Management of Social Media Campaigns; Omni-channel - Integration of Digital Marketing with Traditional Marketing Activities; Digital Privacy and Protection; Ethical Digital Marketing Practice, Trends in Digital Marketing.

MK4603 - MARKETING  
ECTS Credits: 6  

Management and Marketing  

Rationale and Purpose of the Module: The purpose of this module is to introduce students to marketing as a business philosophy and as a management function and to examine the role of marketing in contemporary organisations. This focuses on the need to understand and connect with customers and to develop and deliver products and services that customers value.  

Syllabus: Marketing scope; marketing concept; marketing internal and external environment; understanding customer behaviour; segmentation, targeting and positioning; product and brand management; marketing communications; pricing; distribution; marketing of services; marketing and corporate social responsibility.

MN4007 - PROJECT MANAGEMENT THEORY AND
Prerequisites: MS4404

MS4025 - APPLIED ANALYSIS
ECTS Credits: 6

Mathematics & Statistics

Rationale and Purpose of the Module: To introduce the student to standard techniques of complex analysis, integral equations and Green's functions - and to demonstrate applications of these techniques.

Syllabus: [Functions of a complex variable] including the Cauchy-Riemann equations, Cauchy/E's theorem, singular points, complex integration, residue theorem. Application of residue theorem to the inversion of Laplace transforms. [Conformal mapping] and its application to solving Laplace/E's equation in two dimensions.

[Integral equations] including Volterra equations, Fredholm alternative, Fredholm equations with separable kernels, symmetric kernels, numerical solutions.


Prerequisites: MS4013

MS4027 - FUNDAMENTALS OF FINANCIAL MATHEMATICS

Management and Marketing

Rationale and Purpose of the Module: The primary objective of this module is to provide students with the knowledge, skills and understanding necessary to apply Project Management principles, tools and techniques to help initiate changes to achieve specific pre-determined project objectives in line with organisational goals and strategies. The module will prepare students for the workplace by developing their understanding of Project Management knowledge areas and Project Management processes. The student will benefit from understanding how projects are initiated, implemented, monitored and controlled and closed within a change environment.

Syllabus: Project management organisational strategy and change, project portfolio management, programme management, project lifecycles, project processes, project management strategies and approaches, projects, operations and change, project human resource management, role of the project manager-change agent, project leadership, role of the project team, projects and organisational structures, implementing change through project initiation, project selection, project integration management and project implementation. Developing the project charter, developing the project plan, project communications management, project risk management, project scope management, project estimates, top down estimating, bottom up estimating, project budgets and project baselines, project time management, activity scheduling, resource allocation, project monitoring and control, earned value - monitoring change, cost and schedule variance, cost and schedule performance indices, project change management, project quality management, project computer applications, project closure.

MS4008 - MATHEMATICAL METHODS 2: Numerical Methods for Partial Differential Equations
ECTS Credits: 6

Mathematics & Statistics

Rationale and Purpose of the Module: Having completed this module, the students should understand and be able to apply the standard finite difference methods for the numerical solution of two-dimensional linear partial differential equations; they should also understand how the finite element method is used to solve similar problems.


Finite element method: Introduction to FEM for elliptic problems: analysis of Galerkin FEM for a model self-adjoint two point boundary value problem, weak solutions, linear basis functions, matrix assembly; extension of method to two dimensions, triangular and quadrilateral elements.

Prerequisites: MS4404

MS4021 - CALCULUS 1
ECTS Credits: 6

Mathematics & Statistics

Rationale and Purpose of the Module: This module introduces differential calculus and analysis. It develops problem solving skills and introduces concepts such as definition, lemma, theorem, proof and different methods of proof, including direct, contrapositive and induction.

Syllabus: &bull Basic properties of the real numbers: Important subsets (natural, integers, rationals), open and closed intervals, neighbourhoods, supremum, infimum, boundedness, compactness.
&bull Algebra of Complex numbers: modulus, phase, Argand diagrams, de Moivre’s theorem and roots of complex numbers.
&bull Real valued functions: Definition of function, properties of functions: one-to-one, onto, inverse function, composition of functions, parametric functions.
&bull Limits and continuity: Definition of limit, limit theorems, limit points, definition and meaning of continuity, examples of discontinuous functions (e.g. Heaviside step function), Squeezing Theorem, Intermediate Value Theorem, Bisection Method.
&bull The derivative and differentiation techniques: Differentiation from first principles, derivative of sums, products, quotients, inverse of a function, chain rule, smoothness of a function, Rolle’s theorem, Mean Value Theorem.
&bull Properties of transcendental functions: Including trigonometric, exponential logarithmic and hyperbolic functions; derivatives and inverse functions.
&bull Applications of differentiation: Finding roots of equations (Newton’s method), Indeterminate forms (L’Hospital’s rule); implicit differentiation; optimisation applications, the Second Derivative Test.
&bull Curve sketching: Domain and range, roots of equations, increasing and decreasing, maxima and minima, concavity, points of inflection, symmetry, asymptotes.

MS4002 - APPLIED ANALYSIS
ECTS Credits: 6

Mathematics & Statistics

Rationale and Purpose of the Module: To provide students with the necessary tools and techniques to understand the mathematical foundations of partial differential equations, integral equations, and Green’s functions. Students will learn how to apply these techniques to solve real-world problems in engineering, physics, and other fields.

Syllabus:

1. Partial Differential Equations (PDEs):
   - Elliptic PDEs: Laplace’s equation, Poisson’s equation.
   - Parabolic PDEs: Heat equation.
   - Hyperbolic PDEs: Wave equation.

2. Integral Equations:
   - Fredholm Integral Equations.
   - Volterra Integral Equations.

3. Green’s Functions:
   - Green’s function for Laplace’s equation.
   - Green’s function for Poisson’s equation.

4. Applications:
   - Physical problems involving heat conduction, wave propagation, and electrostatics.

Prerequisites: MS4013

MS4007 - MATHEMATICAL METHODS 4: Numerical Analysis
ECTS Credits: 6

Mathematics & Statistics

Rationale and Purpose of the Module: This module is designed to provide students with a comprehensive understanding of numerical methods for solving mathematical problems. Students will learn how to develop and apply algorithms for solving differential equations, integral equations, and Green’s functions.

Syllabus:

1. Numerical Solution of Ordinary Differential Equations (ODEs):
   - Initial value problems (IVPs) and boundary value problems (BVPs).
   - Explicit and implicit methods.

2. Numerical Solution of Partial Differential Equations (PDEs):
   - Elliptic PDEs: Finite difference and finite element methods.
   - Parabolic PDEs: Explicit and implicit methods.
   - Hyperbolic PDEs: Finite difference and finite element methods.

3. Numerical Solution of Integral Equations:
   - Fredholm integral equations.
   - Volterra integral equations.

4. Numerical Solution of Green’s Functions:
   - Green’s functions for various boundary value problems.

Prerequisites: MS4001
**Syllabus:** Introduction to Derivative Securities: Futures, Forwards, European, path-dependent, and American stock options. Introduction to Interest Rate Derivatives, with a focus on bonds and Forward Rate Agreements.

Using arbitrage arguments to prove properties of options, inequalities, as well as the put-call parity. Introduction to binomial trees and risk-neutral valuation of options via replication arguments (delta-hedging).

Probability theory on finite sample spaces: conditional expectations, martingales, risk-neutral pricing. Use the concept of conditional expectation to formulate and prove the Fundamental Theorems of Asset Pricing I and II.

Value and super-replication of American put options.

Simple time-series models (ARMA(p,q)) for modelling and trading trends and mean-reversion.

**Prerequisites:** MS4035

**MS4033 - METHODS OF LINEAR ANALYSIS**

**ECTS Credits:** 6

**Mathematics & Statistics**

**Rationale and Purpose of the Module:** This is a new module that replaces Linear Analysis MS4013. It includes the previous material on Orthogonal Functions and Laplace Transforms as well as new material on Green's functions and Orthogonal Functions for ODEs.

**Syllabus:** Introduction to Hilbert spaces, orthogonal sets of functions in Hilbert spaces; Fourier series, Fourier and Laplace transformations; linear operators (adjoint operators and dual spaces, self-adjoint and unitary operators); linear integral equations.

**Prerequisites:** MS4022, MS4122

**MS4035 - PROBABILITY MODELS**

**ECTS Credits:** 6

**Mathematics & Statistics**

**Rationale and Purpose of the Module:** This module replaces module MS4213 Probability Theory. It is being created as part of major changes to LM058/LM060, brought about in part by Project Maths. The new first year module MS4222 now contains some probability and this module builds on and extends that knowledge. The intention in this module is to firmly establish the connections between probability theory and its role in statistical applications.

**Syllabus:** Continuous Random Variables: expectation and variance; uniform, normal, exponential, gamma, beta, Cauchy, Weibull, distribution of a function of a random variable.

Jointly Distributed Random Variables: joint distribution functions, sums of independent random variables, conditional densities, functions of jointly distributed random variables, (sum, difference, product, and quotient of two random variables).

Properties of Expectation: computing probabilities and expectations by conditioning, conditional variance, conditional expectation and prediction.

Sampling Distributions: the central limit theorem, the t-, chi-squared and F distributions and their use as sampling distributions; joint distribution of order statistics, distribution of sample range.

Estimation: method-of-moments, fitting standard distributions to discrete and continuous data, pivotal quantities, confidence intervals.

Simulation: Monte Carlo methods, variance reduction techniques, applications of simulation.

**Prerequisites:** MS4222

**MS4043 - METHODS OF LINEAR ANALYSIS**

**ECTS Credits:** 6

**Mathematics & Statistics**

**Rationale and Purpose of the Module:** To introduce the concept of an analytic function of a complex variable and integration on the complex plane.

**Syllabus:** Single- and multi-valued functions, branch points and branch cuts; analytic functions, the Cauchy-Riemann equations; Laurent series, poles and essential singularities; Cauchy's Integral Theorem, Cauchy's Integral Formula; the Residue Theorem, the Estimation Lemma, Jordan's Lemma, integration of functions with branch points; conformal mappings; analytic continuation.

**Prerequisites:** MS4022

**MS4045 - COMPLEX ANALYSIS**

**ECTS Credits:** 6

**Mathematics & Statistics**

**Rationale and Purpose of the Module:** To introduce students to a symbolic algebra package (Maple) as a mathematical problem-solving tool.

**Syllabus:** [Using a symbolic algebra package (MAPLE) for the analysis and solution of simple mathematical models.] Systematic approach to scientific problem-solving.

Extensive use will be made of case studies and
assessment will be largely project based.

MS4105 - LINEAR ALGEBRA 2  
ECTS Credits: 6

Mathematics & Statistics

Rationale and Purpose of the Module: The aim of this module is to introduce some more advanced concepts in Linear Algebra and Numerical Linear Algebra


Prerequisites: MS4102

MS4111 - DISCRETE MATHEMATICS 1  
ECTS Credits: 6

Mathematics & Statistics

Rationale and Purpose of the Module: The aim of this module is to introduce students to some of the language of Discrete Mathematics, and to show its relevance, particularly in the context of Computer Science. It is taught at a level that is appropriate to first year students, i.e. without an excess of formality. The module should re-inforce the development of the students' "thinking" skills, and should enable them to undertake further study in the various applied areas of Discrete Mathematics (coding, graphs, logic and formal systems etc)

Syllabus: Review of sets and operations on sets, power sets.
Propositional logic, truth tables, propositional calculus, equivalence.
Predicate logic, quantifiers, equivalence, application to (mathematical) proof.
Cartesian product of sets, relations, equivalence relations, matrix representation of relations, composition of relations, functions, types of functions.
Number systems, natural numbers, integers, rationals, reals, axioms for N, proof by induction, recursive definitions and algorithms, recurrence relations.
Representations of N (binary, octal, etc), other number "fields".
Introductory combinatorics, permutations, combinations.

Prerequisites: MS4111

MS4117 - DISCRETE MATHEMATICS 2  
ECTS Credits: 6

Mathematics & Statistics

Rationale and Purpose of the Module: To give the student an understanding of the mathematics and applications of Graph Theory. The applications to networks and to algorithms in Computer Science will be emphasised.

Syllabus: Graphs, directed graphs and their computer representation.
Planar, Hamiltonian and Eulerian graphs.
Graph algorithms (Kruskal, Dijkstra, DFS, BFS etc) Graph colouring with applications to scheduling.
Network flows and matchings. Other topics will be covered from time to time: Ramsey Theory, random graphs, Huffman codes, graph drawing, Petri nets.

Prerequisites: MS4111

MS4131 - LINEAR ALGEBRA 1  
ECTS Credits: 6

Mathematics & Statistics

Rationale and Purpose of the Module: The aim of this module is to introduce students to the main ideas of Linear Algebra and its many applications. The emphasis is on developing the student's ability to perform calculations on and with matrices, particularly 2x2 and 3x3 matrices, and on and with vectors in 2 and 3 dimensions. These ideas are then extended to higher dimensions.

Vectors in 2 and 3 dimensions: geometric interpretation of vectors, vector arithmetic, Euclidean norm, Euclidean scalar product, angle, orthogonality, projections, cross product and its uses in the study of lines and planes in 3 dimensions.
Lines and planes in 3-dimensional space: parametric equation of a line, distance between a point and a line, point-normal form and general form of the equation of a plane, distance between a point and a plane.

Extension to vectors in n dimensions;

Systems of linear equations and their solution: Gaussian elimination methods (Gauss, Gauss-Jordan) and inverse matrix method;
Matrices acting on vectors: eigenvalues and eigenvectors particularly in 2 and 3 dimensions.
Applications: least squares fit, rotation matrices.

MS4214 - STATISTICAL INFERENCE  
ECTS Credits: 6

Mathematics & Statistics
Rationale and Purpose of the Module: This course introduces students to the formalities of statistical inference with special emphasis on problems of estimation, confidence intervals, and hypothesis testing.

Syllabus: The notion of a probability model: examples, the need for estimation, confidence intervals and hypothesis tests.

Inference for normal data: chi-squared, t, F, confidence intervals, hypothesis tests, two means, two variances.

Central Limit Theorem: normal approximation to the binomial, application to inference for a single proportion and the difference between two proportions, the chi-squared test for independence.

The likelihood function: the maximum likelihood estimate (MLE), iterative methods for calculating MLE.

Repeated sampling properties: bias, variance, mean squared error, Cramer–Rao bound, large sample behaviour of maximum likelihood estimates.

Interval estimation: pivotal quantities, confidence intervals, approximate confidence intervals based on the MLE.

Hypothesis testing: test statistic, Type 1 and Type 2 errors, power function, the likelihood ratio test.

Prerequisites: MS4213

MS4217 - STOCHASTIC PROCESSES
ECTS Credits: 6

Mathematics & Statistics

Rationale and Purpose of the Module: The purpose of this module is to introduce the students to the mathematical analysis of probabilistic processes which develop over time.

Syllabus: 1. Recap on probability (copies, expectation, MGF, PGF)
2. Random Walks (differences equations & their solutions)
3. Markov Chains (discrete state space, discrete time)
4. Markov Processes (discrete state space, continuous time)
5. Queues (multi-server queues, steady state solutions)
6. Survival Analysis (basic objects, covariates, MLE)

Prerequisites: MS4213

MS4403 - ORDINARY DIFFERENTIAL EQUATIONS
ECTS Credits: 6

Mathematics & Statistics

Rationale and Purpose of the Module: To introduce and consolidate the basic techniques necessary for solving ordinary differential equations (including non-linear equations and phase plane techniques).

Syllabus: Classification, initial and boundary value problems.

Review of first order equations: separable equations, linear and nonlinear equations, integrating factors, exact equations, homogeneous equations; existence and uniqueness; applications e.g., in mechanics, population dynamics.

Second order linear equations, homogeneous with constant coefficients, linear independence and Wronskian, inhomogeneous equations, variation of parameters, applications in oscillators, higher order linear equations, systems of equations.

Series solution of second order linear equations, regular and singular points, Bessel’s equation.

Sturm-Liouville theory

Nonlinear ODEs: ad-hoc solution techniques, introduction to the concepts of stability and phase plane techniques.

Prerequisites: MS4022
To introduce the student to the laws of physics in vector form.

To give the student a solid grounding in vector analysis.

**Syllabus:** [Vectorial Mechanics:] rotation of axes, index notation, review of vector and scalar algebra (scalar vector and triple scalar products); vector functions of a real variable, functions of time; differentiation of vectors, derivative of dot and cross products, tangent to a curve, arclength, smoothness, curvature, applications in mechanics.

[Fields:] scalar and vector fields; functions of several variables, maxima/minima, contour maps, directional derivative and gradient vector of scalar fields; divergence and curl of vector field; applications in electromagnetism and fluid mechanics; vector identities; cylindrical and spherical coordinates.

[Line, surface and volume integrals] line integrals and work; conservation of energy and potential function; applications to planetary dynamics, area, surface and volume integrals; Gauss's Green's and Stoke's theorems. Multiple integrals in radial, cylindrical and spherical coordinates, scalar and vector potentials, Helmholtz's theorem.

[Tensor Algebra and Calculus:] Review of matrix algebra introducing suffix notation; definition of determinant; evaluation of determinants by row and column expansions; eigenvalues and eigenvectors, introduction to Cartesian tensors.

**Prerequisites:** MS4602, MS4022

**MS6011 - ADVANCED METHODS 1**
ECTS Credits: 6

**Mathematics & Statistics**


Review of complex analysis, particularly Taylor/Laurent series, contour integration, branch cuts, the complex Fourier and Laplace transforms and inversion contours.

Applications of complex analysis, including topics from: representation of solutions of Laplace and biharmonic equations via analytic functions Plemelj formulae, Hilbert problem on the real line, Hilbert transform.


**MS6021 - SCIENTIFIC COMPUTATION**
ECTS Credits: 6

**Mathematics & Statistics**

Review of MATLAB, storage allocation, functions and
arrays, matrices, operators and flow control, m-files, graphics, input and output. Review of Fortran 90/95, structure, variables, functions, control structures, basic I/O, arrays, procedures.

Linear algebra
Norms and conditions numbers, linear equations, over and under-determined systems, inverse and pseudo-inverse, factorisations, singular value decomposition, eigenvalue problems, practical case studies.

Non-linear equations
Root finding, optimisation, practical case studies.

Differential equations

Mathematical modelling
Non-dimensionalisation, scaling, asymptotic simplification, practical case studies.

Toolboxes
E.g. Matlab PDE toolbox, NAG toolbox.

MT4023 - MATERIALS 2
ECTS Credits: 6

School of Engineering
Rationale and Purpose of the Module: This course provides a concise introduction to the microstructures and processing of materials (metals, ceramics, polymers and composites) and shows how these are related to the properties required in engineering design.


MT4101 - INTRODUCTION TO MATERIALS
ECTS Credits: 6

School of Engineering
Rationale and Purpose of the Module: To put the subject of Materials Science into historical and modern perspective
To acquaint students with the range of materials available and their classification
To explain the origins of materials, their processing, properties and applications

Syllabus: [Historical background to development of materials and] of the subject of [Materials Science].
[Classes of modern materials]:
- [metals] and alloys
- [polymers] and rubbers.
- [ceramics and glasses
- [composites] including concrete, wood, fibre-reinforced plastics and metal matrix composites.
[Origin of these materials]:
- brief outline of extraction of metals from ores and of processing by casting and mechanical treatment.
- introduction to polymerisation reactions and processing techniques of 'plastics'
- overview of manufacture of ceramics, refractories and glasses.

[Properties] of the different classes [and standard testing techniques]
- mechanical properties
- physical properties
- chemical properties.

[Applications] of different materials [related to] their [properties]
Effects of temperature on polymers and metals.
Mechanical and thermal treatments and properties of alloys.

MT4105 - QUALITY SYSTEMS
ECTS Credits: 6

School of Engineering
Rationale and Purpose of the Module: This course provides a concise introduction to quality management systems such as ISO 9001 and shows how these are integral to the success of Irish industry. Other management system including environment and health and safety are also introduced.

Syllabus: Introduction
What is quality
Quality Assurance Vs Quality Control.
Interface between quality and other business functions
Inter-relationships between quality, reliability, price and delivery.
Quality Management Systems (QMS)
Historical development of ISO 9000
Introduction to ISO 14001
An outline of the elements of ISO 9001
Quality documentation - the purpose of the quality manual, procedures and work instructions.
Organising for quality - the importance of management commitment and leadership and the role of the quality function within the company.
Control of vendors - purchasing criteria and the control of raw materials and service suppliers; vendor assessment.
Auditing and registration - how to conduct audits, auditor criteria, how to apply for registration and what are the requirements.
Product testing and ISO 9001
Introduction to ISO 14001 and OHSAS 18001

MT4207 - FAILURE AND DAMAGE ANALYSIS
ECTS Credits: 6

School of Engineering
Rationale and Purpose of the Module: This course provides a comprehensive overview of failure analysis. It allows students to apply their materials knowledge to analyse component failures.

Syllabus: Introduction to failure and damage.
Gathering information on materials failures
Features which identify different types of failures
Types of failures which occur and how: ductile/brittle,
fatigue, elevated temperature, wear, different forms of
corrosion
Case studies

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MT4943 - MATERIALS PROCESSING
ECTS Credits: 6
School of Engineering

Rationale and Purpose of the Module: To explain how
metals and polymers are converted into products and to
identify the key features of the processes involved.

Syllabus: The response of polymers to heat, melt
processing, material properties affecting melt processing.
Extrusion of plastics, injection moulding and other plastics
processing methods.  Analysis of process operations.
Metals processing, solidification and nucleation processes.
Casting and forging methods, post production treatment,
prevention of residual stress, process design and
optimisation.

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MU4011 - CRITICAL ENCOUNTERS WITH WORLD
MUSIC AND DANCE
ECTS Credits: 6

Humanities

Rationale and Purpose of the Module: This module is
an introduction to the growing field of world music and
dance studies and will introduce the student to a critical
engagement with the category and how it is imagined in a
number of cultural contexts as well as current areas and
modes of research. Students will be exposed to a selection
of world music practices in an academic and peformative
context, providing them with an insight into some of the
diversity of music and dance practices on this planet. The
investigations presented in this module will be particularly
informed by the international disciplines of Arts practice
research, ethnomusicology and ethnochoreology.

Syllabus: Issues addressed in this module will be taken
from current research engagements with the concept of
world music and dance and will examine a selection of
diverse practices that are seen to constitute and
sometimes challenge this category. These will critically
engage historical narratives, conceptual structuring and
evolving identities of the traditions in question. A particular Arts
practice lens will be engaged so students can experience the
aesthetic and structure of the tradition per formatively.

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MU4001 - CRITICAL ENCOUNTERS WITH IRISH
MUSIC AND DANCE
ECTS Credits: 6

Humanities

Rationale and Purpose of the Module: This module is
an introduction to the growing field of traditional music
and dance studies and will give the student an overview of
some of the important features of these traditions as well as
current areas and modes of research in this context. The
investigations presented in these modules will be
particularly informed by the international disciplines of
Arts practice research, ethnomusicology and
ethnochoreology. Students here will also be introduced to
responsible and accountable academic and research
practices.

Syllabus: Issues addressed in this module will be taken
from current research engagements with the native Irish
music and dance traditions. These will critically engage
historical narratives, conceptual structuring and evolving
identities of the traditions in question. A particular Arts
practice lens will be engaged so students can experience the
aesthetic and structure of the tradition per formatively. Students will be develop
writing and presentation skills associated with such
academic engagement and be introduced to concepts of research as
a creative, scholarly practice.

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Humanities

MU4001 - CRITICAL ENCOUNTERS WITH IRISH
MUSIC AND DANCE
ECTS Credits: 6

Rationale and Purpose of the Module: This module allows students on the BA Performing Arts to develop
performance skills in a second instrument. Students will have the opportunity to critically engage embodied
expressions of performance practice on an instrument and
or practice other than that in their core Practicum A
module. Students will engage these studies in a
environment informed by recent principles in arts practice
research. This module will give students invaluable new
perspectives on their creative and artistic potential. This is
an elective module to be offered throughout the BA in
Performing Arts programme and is subject to the Irish
World Academy being able to source appropriate expertise
and resources.

Syllabus: Students in this module will develop a second
instrumental performance area in small group and
one-on-one contexts. No previous experience of the
adopted instrumental practice is necessary. Students will
develop and document an appropriate practice regime as
well as use reflective tools such as auto-ethnographic
journals.

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MU4021 - INTRODUCTION TO SONGWRITING
ECTS Credits: 6

Humanities

Rationale and Purpose of the Module: The purpose of
this module is to introduce students to the relevant skills
and basic creative processes entailed in songwriting. By
creating new work in a collaborative environment,
students will develop as reflective artists and composers,
engaging in meaningful self and peer-to-peer critique.

Syllabus: Through weekly workshops, students will
experiment with different methods of developing original
songs, considering simple elements of melody, lyrics and
structure of song. Through weekly lectures and
engagement with post-graduate students of MA
Songwriting, students will be exposed to a range of
different songwriters of varying genres and styles. They
will be encouraged to locate their own creative practice
within the wider experience of songwriting, engaging in
reflective practice through group discussion, and
individual journaling and self-evaluation.
MU4135 - IRISH TRADITIONAL MUSIC 1  
ECTS Credits: 6

Humanities

Rationale and Purpose of the Module: This module is an introduction to the growing field of traditional music and dance studies and will give the student an overview of some of the important features of these traditions.

Syllabus:  
Issues addressed in this module will be dance tune types and structure, English language song tradition, instrumentation, traditional music and dance in America in the first half of the twentieth century, the harp tradition to 1800, modern step dancing, ceili dancing.

MU5003 - TECHNIQUE, REPERTOIRE AND STYLE - 3  
ECTS Credits: 12

Humanities

Rationale and Purpose of the Module: The module focuses on the individual instrument. The purpose of the module is the facilitation of performance tuition to the highest standard. The module provides progressive tuition, within the framework outlined in Technique, Repertoire & Style 1 and Technique, Repertoire & Style 2.

The ultimate goal of the module is to improve the quality of the music making and artistry demonstrated by the student and to prepare for public performances aiming towards professional level.

Syllabus: The module comprises of intensive study within the framework of studio teaching and master classes. The module is based on skill and competency of execution. Contact time with individual teachers concentrates on increased repertoire and more advanced skills and technique.

The knowledge is structured within three key areas:  
1. Instrumental skills aiming towards technical fluency and mastery  
2. Repertoire knowledge relevant to the instrument  
3. Stylistic knowledge working towards informed choices of interpretation

The foundations of repertoire and style formed in Technique, Repertoire & Style 3 will be built upon the consolidation of skills learned in Technique, Repertoire and Style 1 & 2, as well as development of more advanced skills and technique.

The materials and pedagogical direction of this module, because of its one-to-one tuition and highly individualistic approach is open to the teachers interpretation and revision in actual practice.

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MU5023 - MUSIC THERAPY FIELDWORK PRACTICE 2  
ECTS Credits: 12

Humanities

Rationale and Purpose of the Module: To provide students with the opportunity to develop skills in  
1. Providing weekly regular clinical work to clients in a health, welfare, community or educational setting  
2. Learning in context to apply the framework of assessment, programme planning, implementation, evaluation and reporting

Syllabus: Students will continue a fieldwork placement alongside a qualified music therapist in a health, welfare, community or educational setting in Ireland up to two days per week. In this supervised fieldwork placement students will develop competencies in planning and leading sessions with music therapy clients. Students will gain information about the role of the facility in addressing needs of clients and the role of music therapy within the broader operational remit of the facility.

Prerequisites: MUS062

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MU5033 - MUSIC THERAPY PRACTICE 2  
ECTS Credits: 12

Humanities

Rationale and Purpose of the Module: The module is focussed on psychodynamic and psychosocial approaches within music therapy practice. Core theoretical frames to inform family work, and work with adults in mental health contexts, medical contexts and community work will be presented. The role of music therapy in addressing the needs of medical patients will be presented. Students will attend a weekly experiential group. Clinical improvisation skills will be extended.

Prerequisites: MUS211

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MU5043 - MUSIC THERAPY PROJECT 1  
ECTS Credits: 6

Humanities

Rationale and Purpose of the Module: For students to develop a music therapy research from idea to ethical clearance stage.

Syllabus: Development of research from idea through to ethical clearance. Students will examine issues in research design including choice of data collection methods and methods to analyse data. Students will consider issues around ethics in research, including informed consent, management of sensitive materials, and the role of the researcher in managing participation.

Prerequisites: MUS071

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MU5053 - ENSEMBLE 3  
ECTS Credits: 12

Humanities

Rationale and Purpose of the Module: The module
involves progressive training in String Chamber Ensemble and String Chamber Orchestra according to the framework outlined in Ensemble 1 & 2.

**Goals of the module include public performances and periodic interaction with professional members of the Irish Chamber Orchestra.**

The ultimate goal of the module is to improve the quality of the music making and artistry demonstrated by the student within ensemble playing and to prepare for public performances aiming towards professional level and quality.

**Syllabus:** Contact time in the form of coaching with individual teachers and group projects will focus on an increased development of the repertoire and ensemble skills learned in Ensemble 1 & 2, as well as new and more advanced repertoire. Ensemble 3 will be built upon the consolidation of skills learned in Ensemble 1 & 2, as well as the development of more advanced skills and performance projects.

The materials and repertoire of this module and the balance of the two key segments within each semester will be at the discretion of the programme director and studio teachers based on the distribution of instrumentalists within the student body and the available periods within the work schedules of the Irish Chamber Orchestra.

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**MU5061 - ARTS IN HEALTH**
ECTS Credits: 6

**Humanities**

**Rationale and Purpose of the Module:** The aim of this module is to provide an overview of the history and the development of the arts in a range of healthcare settings.

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**MUS101 - HISTORY OF ETHNOMUSICOLOGY**
ECTS Credits: 12

**Humanities**

**Rationale and Purpose of the Module:** The aim of this module is to provide an overview of the history and the theory of ethnomusicology since the 19th century and to understand its close connections to social and cultural anthropology in order to equip the students with knowledge of the principles that have been propounded by ethnomusicologists and with issues currently under debate.

**Syllabus:** Readings include both exemplary original texts drawn from the history of the field and more recent historical and theoretical overviews. Students are also asked to read and review two book-length musical ethnographies selected from a recommended list of recent works. A 5000 word essay will address a particular topic of the student's choice, designed in consultation with the course director.

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**MU5211 - CLINICAL ORIENTATION**
ECTS Credits: 12

**Humanities**

**Rationale and Purpose of the Module:** Introduction to music therapy concepts and methods as they relate to clinical practice.

**Syllabus:** The module is focused on the development of practical music making skills related to music therapy practice, observational skills and assessment and treatment planning skills.

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**MU5361 - RITUAL CHANT AND SONG PRACTICUM 1**
ECTS Credits: 12

**Humanities**

**Rationale and Purpose of the Module:** The provision of specialist training towards the development of idiomatic performance across a range of vocal repertoires including Western plainchant, Irish traditional religious song, the Western choral tradition and world ritual vocal repertoires.

- the development of skills pertinent to choral / schola singing and conducting / facilitation
- the development of skills pertinent to vocal accompaniment, as appropriate to specialist repertoires.
- the provision of training in sight-singing, aural training and transcription from oral dictation
- the development of a contextual approach to ritual vocal performance

**Syllabus:** This module will provide specialist vocal training, appropriate to the idiomatic performance of a range of vocal repertoires including Western plainchant, Irish traditional religious song, aspects of the Western choral tradition and selected world ritual vocal repertoires; tuition will include solo vocal technique and repertoire classes; instruction in schola and ensemble singing; conducting and facilitating ensemble performance; vocal accompaniment as appropriate to specialist repertoires; sight-singing and aural training within a contextual approach to vocal repertoires and performance techniques.

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**MU5401 - TECHNIQUE, REPERTOIRE AND STYLE - 1**
ECTS Credits: 12

**Humanities**

**Rationale and Purpose of the Module:** The module focuses on the individual instrument. The purpose of the module is the facilitation of performance tuition to the highest standard.

The ultimate goal of the module is to improve the quality of the music making and artistry demonstrated by the student and to prepare for public performances aiming towards professional level.

**Syllabus:** This module takes the student from his/her point of entry and expands on technical mastery and repertoire knowledge with the view of gaining insight into performance styles relevant to musical history and tradition in the classical genre.
The module is based on skill and competency of execution. The student may have to begin the module with extensive revisions in technique and a somewhat different approach to the instrument owing to the pedagogy of the professor involved.

The knowledge is structured within three key areas:

1. Instrumental skills aiming towards technical fluency and mastery
2. Repertoire knowledge relevant to the instrument
3. Stylistic knowledge working towards informed choices of interpretation

The materials and pedagogical direction of this module, because of its one-to-one tuition and highly individualistic approach is open to the teacher/Es interpretation and revision in actual practice.

MU5411 - ENSEMBLE I
ECTS Credits: 12

Humanities
Rationale and Purpose of the Module: This module features training the genre of string chamber ensemble and string chamber orchestra.

An inherent part of any string playerÆs milieu is the art of ensemble playing. It must be constantly explored and used to be value as an artistic form and musical expression.

Solo playing brings to bear the focus of individual decisions on the music itself. Ensemble playing requires a specialised skill and a particularly developed musical intelligence based on the ability to weigh musical options in the light of other individuals playing in the same continuum.

Goals of the module include public performances and periodic interaction with professional members of the Irish Chamber Orchestra.

Syllabus: The module is structured around two key elements / segments:
1. String Chamber Ensemble
2. String Chamber Orchestra

The String Chamber Ensemble segment aims to develop and hone skills relative to the genre of string quartets, trios, quintets or larger ensemble pieces. Students are expected to work constructively in groups and take responsibility for their individual preparation and the organisation of group rehearsal times. The chamber groups are taught and coached in the context of laboratory work in forms of studio master classes with their respective teachers.

The String Chamber Orchestra segment involves periodic interaction with members of the Irish Chamber Orchestra. The presence of the Irish Chamber Orchestra on the university campus gives young string players an insight into the professional world and working experience of an internationally acclaimed chamber ensemble.

The materials and repertoire of this module and the balance of the two key segments within each semester will be at the discretion of the programme director and studio teachers based on the distribution of instrumentalists within the student body and the available periods within the work schedules of the Irish Chamber Orchestra.

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MU5511 - COMMUNITY MUSIC SKILLS I
ECTS Credits: 12

Humanities
Rationale and Purpose of the Module: To provide instruction in foundations, history and principles of community music; to offer students a brief and broad experience of the field; to combine practical and academic perspectives on Community Music; to offer this programme within an environment sensitive to an ethnomusicological and performance perspective and which encourages cross-platform performance and learning.

Syllabus: History, culture and political developments and issues in Community Music; gender considerations, shifting demographics, models and functions of community music and community arts, diverse learners and community contexts, case studies.

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MU5501 - COMMUNITY MUSIC IN CONTEXT
ECTS Credits: 12

Humanities
Rationale and Purpose of the Module: To provide instruction in foundations, history and principles of community, to offer students a brief and broad experience of the field; to combine practical and academic perspectives on Community Music; to offer this programme within an environment sensitive to an ethnomusicological and performance perspective and which encourages cross-platform performance and learning.

Syllabus: History, culture and political developments and issues in Community Music; gender considerations, shifting demographics, models and functions of community music and community arts, diverse learners and community contexts, case studies.

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MU5611 - TRADITIONAL IRISH MUSIC PRACTICUM
ECTS Credits: 12

Humanities
Rationale and Purpose of the Module: To encourage creativity and individuality in performance practice; to develop performing skills in the context of individual and group classes; to allow the student under supervision to design and follow a specially prepared music performance programme tailored to his/her musical ambitions and educational needs; to develop ensemble skills.

Syllabus: In this module the student will create and design their own performance programme under the supervision of the course director. Also, students will take tutorials with or tutors on the programme to facilitate their work-in-progress and to provide support for the successful realisation of individual performance projects. This module is in preparation for a public performance.

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MU6003 - PRACTICAL SKILLS OF MUSIC 3
ECTS Credits: 3

Humanities
Rationale and Purpose of the Module: To provide further practical guidance in the area of school and classroom music. To develop extra skills specifically
related to the facilitation of music learning, teaching, direction and performance. To further develop an awareness in the student of his/her position as a music educator and as a community musician within the entire school community. To further facilitate competency in essential aural, compositional and performance skills.

**Syllabus:** Students will acquire further skills related to the facilitation and production of music technology in an educational context including sequencing, the use of notational software, and recording, editing and sound production. Students will develop skills in advanced conducting in a variety of contexts. Students will increase their competence specifically in vocal skills, vocal health and in keyboard skills. Students will further develop their skills in relation to musical accompaniment with specific reference to accompanying in a classroom context, in an examination context and in relation to extracurricular contexts in the school. Students will further their skills in relation to musical composition and arranging in a variety of contexts and musical genres. Students will further their competence in their performance of one or more musical instruments appropriate to post-primary education.

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**MU6041 - MUSIC PEDAGOGY**

**ECTS Credits:** 6

**Humanities**

**Rationale and Purpose of the Module:** To consider topics of pedagogy from the perspectives of specific teaching of music so as to enhance the quality of teaching practice experience. To enable students to undertake structured observation in the classroom. To develop the ability to reflect critically on one's own teaching and one's role within the school. To examine aspects of curriculum, methodology and assessment as they relate to music education. To apply current research to practice.

**Syllabus:** This module facilitates the student teacher's initial experiences in the school and in the school music department. Junior and Leaving Certificate cycle music syllabi are reviewed, critiqued and addressed in relation to issues of implementation. Transition year music programmes are explored and designed through research and reflection. Structures of subject knowledge, innovation in the classroom, practice room and concert hall/performing platform are addressed. Curriculum development, mixed ability teaching, alternative approaches to assessment and reflective evaluation, and current research are discussed and presented in a variety of national and international contexts. Varieties of teaching and learning styles, classroom, laboratory, concert hall organisation, the use of ICT and of music technology in the classroom, international perspectives, cultural issues and cross-curriculum aspects are explored in lecture and lab sessions.

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**MU6031 - PRACTICAL SKILLS OF MUSIC 1**

**ECTS Credits:** 6

**Humanities**

**Rationale and Purpose of the Module:** To provide practical guidance in the area of classroom music. To develop skills specifically related to the facilitation of music learning, teaching and performance. To develop an awareness in the student of his/her position as a music facilitator in the school at large. To facilitate competency in essential aural, compositional and performance skills.

**Syllabus:** This module explores and utilises students' own performing skills and creative music making abilities in order to address the facilitation and production in the school setting of a variety of music making possibilities. Students will research and explore ensemble music, choral singing, school bands, orchestras, percussion and recorder groups, singing including vocal health, traditional Irish, popular and world musics. Dance, theatre, improvisation, accompaniment, conducting, harmony, counterpoint, composition, melodic and rhythmic writing and recognition will be central in the music lesson. The use of music technology as a teaching and learning tool, and the concept of literacy and numeracy will also provide a focus in practice. Varieties of teaching and learning styles, classroom, laboratory, performing platforms, the use of ICT and of music technology in the classroom, international perspectives, cultural issues and cross-curriculum aspects are explored in ab sessions.

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**MU6051 - ARTS INFORMED RESEARCH 1**

**ECTS Credits:** 6

**Humanities**

**Rationale and Purpose of the Module:** This course is an introduction to research in the context of music therapy as an arts-dependent practice and covers arts-based research methodology, the research process, skill-development in critical thinking, and research scholarship including writing, presenting and/or discussing research outcomes and current issues in research. As a prerequisite for MU5043, it introduces the beginner researcher to the tools, knowledge and critical thinking required to conduct research in their clinical area of interest.

**Syllabus:** The study of research methods pertains to an investigation of music therapy as an arts-dependent practice and covers contexts for arts-based research, the research process, skill-development in critical analysis, and research scholarship including writing and/or discussing research outcomes and current issues in research. This course is a prerequisite for MU5043 and introduces the beginner researcher to the tools, knowledge and critical thinking required to conduct research in their preferred clinical area of interest.

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**MU6061 - MUSIC ETHNOGRAPHY**

**ECTS Credits:** 6

**Humanities**

**Rationale and Purpose of the Module:** This module trains students in the epistemology, methodology, methods and techniques for sustained ethnographic inquiry.

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**NS3201 - MICROBIOLOGY, IMMUNOLOGY AND INFECTION CONTROL**

**ECTS Credits:** 3

**Nursing & Midwifery**

**Rationale and Purpose of the Module:** The aim of this module is to provide the student with a knowledge and understanding of microbiology with application to health care settings nursing and midwifery practice.

**Syllabus:** Micro-organisms Nature of microorganisms and their growth, basic understanding of bacteria, fungi and viruses, general pathogenesis, portals of entry; cycle of infection, basic epidemiology and how an infectious agent is transferred through a population; control of spread of
infection, cultivation and identification of pathogens. Pathogenesis in key infections. Infection control in the hospital and community setting, guidelines in isolation precautions. Carrier status amongst health care professionals: practice and developments. Disinfection and sterilization of equipment. Antibiotics: mode of action in relation to specific diseases; antibiotic resistance; public health measures to ensure antibiotic efficacy: Directly Observed Therapy; reserved drugs; public and professional awareness. Microbiology in relation to nursing and midwifery care and public health awareness: such as HIV, CJD, Cl. diff., TB, and MRSA. Immunology: the immune response reviewed; antibody diversity; allergy and anaphylactic shock; the immuno-suppressed patient; immunisation in current public health programmes.

Clinical Skills:
Standard precautions
Introduction to aseptic technique
Specimen observation /collection/testing, labelling, transport (sputum, urine, and blood)
Wound care and wound management
Removal of sutures and clips

NS4013 - HEALTH STUDIES
ECTS Credits: 6

Nursing & Midwifery

Rationale and Purpose of the Module: To provide nurses and midwives with the necessary foundation to develop competence in health education and health promotion.

Syllabus: Concepts of health and ill-health; Measuring health and health science; Determinants of and influences upon health. The social construction of Life styles; The history of health education and health promotion; Models and approaches to improving health; Assessing needs and programme planning; Ethical issues; inequalities, disadvantage and empowerment; Settings for programmes; health policy and politics.

NS4024 - INTRO. TO THE PRINCIPLES AND NATURE OF TEACHING AND LEARNING FOR NURSES AND MIDWIVES
ECTS Credits: 9

Nursing & Midwifery

Rationale and Purpose of the Module: The aim of this module is to provide the students with the teaching skills necessary to facilitate teaching and learning within the nurse practice/learning environment.


Clinical Skills
Microteaching in a clinical setting
Microteaching in a classroom setting
Clinical competencies: assessment/documentation/feedback

NS4037 - PROMOTING SUPPORTING AND PROTECTING BREASTFEEDING
ECTS Credits: 6

NS4047 - PREPARATION FOR PARENTHOOD
ECTS Credits: 6

Nursing & Midwifery

Rationale and Purpose of the Module: To enable the student to critically consider the promotion, support and protection of breastfeeding. Fulfil the requirements of the Baby Friendly Hospital Initiative including the provision of safe artificial feeding

Syllabus: Theoretical content: Social, cultural, psychological and political influences on aspects of breastfeeding, infant feeding; National and International Breastfeeding policies and their management, health benefits including BFHI; The importance of breast-feeding to mother and baby, Health care practices that support breastfeeding; and artificial feeding; Counselling skills to support breastfeeding.; Anatomy and physiology of lactation, Biochemistry of human milk, Impact of birthing practices on breastfeeding; Breastfeeding facilitation for healthy mothers and newborns.; Breastfeeding management under difficult circumstances.; breastfeeding management when the mother is ill; Infants with special needs; Alternative methods of infant feeding when breastfeeding is not possible; Infant nutrition and weaning practices; Hospital and community support; Drug therapy and breastfeeding, maternal nutrition during lactation, maternal employment and breastfeeding. Clinical skills Facilitating an antenatal workshop on positioning and attachment for breastfeeding babies. Use of support mechanisms for successful breastfeeding. Breastfeeding under special circumstances (breastfeeding the preterm baby, twins, baby with cleft lip and palate). Facilitating a postnatal breastfeeding clinic. Lactation Consultants role and challenges in protecting breastfeeding. Promoting, supporting and protecting breastfeeding in the community setting

Clinical Skills
Communication skills
Positioning and attachment workshop
Breastfeeding under special circumstances (breastfeeding the preterm baby, multiple births, baby with cleft lip and palate)
Facilitating a postnatal breastfeeding clinic
Hand expression, pump expression, cup feeding, breast milk storage; safe formula feeding

NS4061 - INTRODUCTION TO MIDWIFERY
Nursing & Midwifery

Rationale and Purpose of the Module: To introduce students to the philosophy, knowledge and skills underpinning midwifery practice

Syllabus: Philosophy, history and regulation of midwifery practice, - professional identity, accountability and conduct. Principles of individualised and woman centred care, role of the midwife in normal birth. Structure and provision of maternity services. Introduction to midwifery theories, reflective practice and evidence based practice. The role of the midwife in the provision of care in normal pregnancy, birth and puerperium. Introduction to local national and international breastfeeding policies. Principles of effective study skills.

clinical skills syllabus:

Handwashing
Prevention of infection - hand hygiene, standard precautions aseptic technique
Maternal and infant observations and assessment skills including taking & recording vital signs, obtaining and testing urine specimens
Communicating and recording in midwifery practice
Principle of medication management
Introduction to skills required for caring for mothers and babies in the maternity setting
Skills to support parents to care for their baby - infant care practices, hygiene needs and safety

NS4071 - ADAPTATIONS TO PREGNANCY
ECTS Credits: 6

Nursing & Midwifery

Rationale and Purpose of the Module: To facilitate students to acquire knowledge and understanding of adaptations to pregnancy from a physiological and psychosocial perspective


Clinical skills:

Landmarks and diameters of female pelvis and their fetal skull and their application to midwifery practice


Clinical skills:

Examination of the neonate at birth including initial steps of resuscitation. Ongoing Checking and use of the resuscitaire On-going assessment and monitoring of the neonate including neonatal vital signs Care of the neonate, administration of Vitamin K Breastfeeding practices Formula Expressing and storing of breast milk Infant feeding practices Metabolic skills Newborn bloodspot screening technique

NS4081 - CONTEMPORARY NURSING STUDIES
ECTS Credits: 6

Nursing & Midwifery

Rationale and Purpose of the Module: The purpose of this module is to explore the contemporary issues influencing and informing practice and the evolving role of contemporary nursing in meeting health care needs globally.


NS4201 - BIOLOGICAL SCIENCES 1, ANATOMY AND PHYSIOLOGY
ECTS Credits: 3

Nursing & Midwifery

Rationale and Purpose of the Module: To provide the foundation for understanding the anatomy and physiological functioning of the human system so as to assist in the study of the effects of illness and disease on the individual.

Syllabus: Introduction to the body as a whole, tissues, organs, system, and cavities of the body. Cellular structure, the cell surface, cytoplasm, filtration, and
simple diffusion. Tissues: epithelial, connective, muscle and nervous. The Integumentary System: Histological structure and function of the skin and subcutaneous tissue. The Skeletal System: Structure and function of the skeleton, the healing of fractures. Joints: Classification, structure, function. Muscles: Structure and function. The Central Nervous System: Meninges, ventricles and cerebrospinal fluid, blood supply and the brain barrier system, structure and function of the spinal cord, the midbrain, the pons varolii and cerebellum, the cerebrum, medulla oblongata, the limbic system. The Peripheral Nervous System and Reflexes: Classification and anatomy of nerves and nerve fibres, the cranial nerves, the spinal nerves, nerve plexuses, the nature of reflexes, components of a reflex arc. The Autonomic Nervous System: Anatomy of the sympathetic and parasympathetic division, functions of the autonomic nervous system, the adrenal glands, neurotransmitters and receptors.

NS4203 - BIOLOGICAL SCIENCES 3 ANATOMY, PHYSIOLOGY AND PATHOPHYSIOLOGY
ECTS Credits: 6

Nursing & Midwifery

Rationale and Purpose of the Module: The aim of this module is to provide students with a foundation for understanding normal human anatomy and physiological function, considered essential for the later study of illness and disease in the individual.


NS4208 - MUSIC IN NURSING AND HEALTHCARE
ECTS Credits: 6

Nursing & Midwifery

Rationale and Purpose of the Module: This module aims to enhance the student's knowledge of music as a therapeutic medium and potential uses and misuses of music in healthcare environments

Syllabus: A brief history of the uses of music in healthcare; an examination of the research literature pertaining to developing students' knowledge of, the uses of music in healthcare environments the role of music in promoting wellbeing in the healthcare environment, and developing students' skills in exploration of and reflection on the sound environment of health care settings in which they have had practical experience, the ability to discern how music can be offered as a creative and positive stimulus to promote positive outcomes for the individuals.

NS4211 - THE ART AND SCIENCE OF NURSING
ECTS Credits: 6

Nursing & Midwifery

Rationale and Purpose of the Module: The module will introduce students to the core concepts underpinning the art and science of nursing, and the professional nature of nursing

Syllabus: Historical development of nursing. Regulation of nursing profession. Professionalism. Patient safety agenda and quality care. Caring, empathy and care delivery systems e.g. team nursing, multidisciplinary teamwork and the nursing process. Therapeutic relationships and holistic models of care. Models of reflective practice., Evidence-based practice. Introduction to competencies. Introduction to library skills, study methods skills and the presentation of academic material.

NS4213 - PRINCIPLES OF NUTRITION NURSING
ECTS Credits: 3

Nursing & Midwifery

Rationale and Purpose of the Module: The aim of this module is to introduce students to the role of nutrition in health care and disease prevention so that the specialist needs of a person experiencing dietary difficulties can be addressed

Syllabus: Nutrients, their functions, metabolism, food
syringes and optimal nutrition for the promotion and maintenance of health and prevention of disease. Absorption, digestion, and vital functions of the macronutrients (protein, carbohydrate and fat) and the micronutrients (vitamins and minerals). Changes in nutritional needs throughout the life cycle including special considerations during pregnancy, lactation, and aging. Nutritional standards, the role of nutrition in disease prevention and clinical nutrition topics including PKU, malnutrition, and dietary recommendations for diabetes. Interventions to maintain nutritional status in illness. Nutrition as an interdisciplinary approach to health care and disease prevention and its application to the individual, in community health and education. Introduction to the use of computer-based diet analysis to evaluate personal dietary intakes. The role of the nurse in meeting the specialist nutritional needs of a person experiencing dietary difficulties. Applied pharmacology.

Clinical Skills Syllabus:
Nutritional assessment and management
Assisting with oral intake of food and drink
Weight management
Oral assessment and hygiene
Enteral and parenteral, naso gastric and PEG

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**NS4215 - SPECIALISED NURSING CARE**
ECTS Credits: 6

**Nursing & Midwifery**

Rationale and Purpose of the Module: The aim is to facilitate the student understanding of oncology, palliative care, mental health, and intellectual disability so that they may provide appropriate care to these groups of individuals. In order to prepare general nurses to support patients/clients with specific and complex needs the process of identifying needs, planning, prioritising, implementing and evaluating nursing care will be considered.


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**NS4218 - COGNITIVE - BEHAVIOUR THERAPY**
ECTS Credits: 6

**Nursing & Midwifery**

Rationale and Purpose of the Module: This purpose of this module is to provide students with a knowledge and understanding of the principles of cognitive behavioural therapy and its application within nursing practice.


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**NS4221 - ADULT NURSING CARE**
ECTS Credits: 6

**Nursing & Midwifery**

Rationale and Purpose of the Module: This module introduces students to the challenges of nursing individuals in the acute hospital and community setting. The process of assessing and identifying needs, planning, prioritising, delivering and evaluating nursing care will be explored. The module aims to discuss evidence based nursing assessment and management strategies supported by current healthcare policies to ensure holistic and safe care for all individuals and their families. The purpose of this module is to facilitate students understanding of the nursing required for the acutely ill adult.

Syllabus: Nursing care and management of the acutely ill adult: Altered levels of consciousness, pressure area maintenance. Pain: Definitions, dimensions, measurement, strategies to support and care for the individual experiencing pain. Introduction to peri-operative nursing care: Elective and emergency surgery; altered homeostasis, peri-operative complications e.g. anaphylaxis, malignant hyperthermia, hypovolaemic and neurogenic shock. Psychosocial aspects of the nursing care of the ill adult e.g. stress, sleep and sensory deprivation, altered body image, role of the family and carer’s. Nursing care and management of individuals experiencing altered skin integrity e.g. wounds, burns, dermatological conditions. Applied pharmacology

Clinical Skills Syllabus:
Principles of hand hygiene
Assisting and promoting personal care
Bed making
Assessment and maintenance of skin integrity
Peri-operative care
Introduction to assessment of levels of consciousness

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**NS4223 - RENAL AND GASTROENTEROLOGY NURSING**
ECTS Credits: 6

**Nursing & Midwifery**

Rationale and Purpose of the Module: The purpose of this module is to facilitate students understanding of gastro-enterological and renal disorders and the application of appropriate nursing care to an individual with such condition(s).

Syllabus: Gastro-enterological disorders: e.g. cirrhosis, oesophageal varices, peptic ulceration, appendicitis, colitis, pancreatitis, gastroenteritis; intestinal obstruction; nursing care and management. Renal disorders: infection and obstruction, acute and chronic renal failure; nursing care and management. Dialysis, organ transplants. Applied pharmacology. Nurses’ role and responsibilities in investigative and diagnostic procedures

Clinical Skills Syllabus:
Catheterisation, catheter care, catheter removal, Bladder care
Continence care
Enema/suppository administration, Skoma care
Naso-gastric aspiration
NS4228 - PAIN MANAGEMENT
ECTS Credits: 6

Nursing & Midwifery

Rationale and Purpose of the Module: This module offers the student an opportunity to further develop knowledge and understanding of the complexities and challenges of pain management in order to provide additional theoretical support to underpin their practice. The module also aims to build upon the knowledge gained in years one, two and three of the programme enabling the student to address complex care management issues.

Syllabus: The multidimensional nature of pain; The physiology of nociceptive and neuropathic pain. The effects of pain physical, psychological, social and spiritual aspects individual reactions and manifestations; Pain tolerance and pain responses; Barriers to effective pain management.; Interventions to alter sensory input and reduce pain perception. The role of the nurse as a member of the healthcare team e.g. Assessment and measurement of pain planning and implementing pain management interventions and evaluating outcomes. Pain management of groups with special needs, e.g. child, older person. Applied pharmacology.

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NS4305 - NURSING THE CHILD AND ADULT WITH BEHAVIOURAL DISORDER
ECTS Credits: 6

Nursing & Midwifery

Rationale and Purpose of the Module: The aim of the module is to critically evaluate current attitudes and practices that support persons with an intellectual disability and associated behavioural or mental health difficulties.

Syllabus: Human behaviour, adaptive and maladaptive responses Role of the RNID in supporting and assisting the individual with an intellectual disability and associated behaviour problems for e.g. self-injurious behaviour, aggressive and violent behaviours. Behavioural and cognitive therapies and the nursing process. Mental health difficulties across the life span. Concept of dual diagnosis in intellectual disability. Nursing care and management of the child and adult with an intellectual disability experiencing mental health difficulties, e.g. phobias, eating disorders, stereotypical, aggressive and violent behaviours; anxiety disorders; psychotic disorders; perceptual and mood disorders, schizophrenia, depression. Habit and conduct disorders, attention deficit disorders with or without hyperactivity. Applied pharmacology

Clinical skills
Risk assessment skills of observation and monitoring behavioural management strategies
Relaxation techniques and arts in the management of anxiety, anger management.
De-escalation techniques
Cognitive behavioural therapy

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NS4315 - NURSING AND ALLIED THERAPIES
ECTS Credits: 6

Nursing & Midwifery

Rationale and Purpose of the Module: The purpose of this module is to apply and analyse creative mediums which support the development of life skills for persons with an intellectual disability.

Syllabus: The role of the nurse in facilitating and processing diversional and recreational activities for persons with an intellectual physical/sensory disability. The role of creative mediums in health promotion, inclusion, choice and empowerment and reflection for people with intellectual disabilities. The use of drama to promote education, skill development and advocacy in the lives of people with an intellectual disability. Occupational and recreational social and self-help skills, for example swimming. Introduction to movement as an educational medium; expressive and creative movement skills for example drama, dance and mime, Creative games in group work. Strategies and techniques for implementing creative sessions for persons with an intellectual disability for example arts and crafts, puppetry.

Clinical Skills
Arts and crafts
Drama
Dance
Mime
Puppetry skills

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NS4321 - CONCEPTS AND NATURE OF INTELLECTUAL DISABILITY
ECTS Credits: 6

Nursing & Midwifery

Rationale and Purpose of the Module: This module aims to introduce the student to the concept of intellectual disability, nursing practice and a rights based approach to care. and service provision. Within the module the role and contribution of the RNID in caring for people with an intellectual disability is integrated and cognisance is paid to the ever changing paradigm shifts of service ideologies and healthcare provision.

Syllabus: Concepts of impairment and disability: its incidence, causation, manifestation, classification criteria and terminology; Differentiation between intellectual disability, mental illness; Historical development of nursing practice, service provision and approaches to nursing care (e.g. holism, person-centred). The role and
function of the nurse as a healthcare professional, member of the multi-disciplinary team in wider healthcare service. Organisational philosophy and ethos of service providers, nurse-client relationship and communication. Theory and application of the principles of normalisation, deinstitutionalisation, empowerment and advocacy. Effects of disability on the nuclear, extended family and society

Clinical Skills Syllabus:
Principles of hand hygiene
Assist with bathing/bed making,
Personal hygiene
Promotion and maintenance of elimination,
Safe positioning of clients,
Assessment and maintenance of skin integrity

NS4323 - NURSING ADOLESCENTS AND ADULTS WITH INTELECTUAL DIS
ECTS Credits: 6

Nursing & Midwifery
Rationale and Purpose of the Module: The aim of this module is for each student to develop knowledge and skills required to support the person with an intellectual disability through adolescence and adulthood with their family.

Syllabus: Theories of adolescent and adult development. Cognitive, social and personality development. Implications of intellectual disability upon the adolescent and adult.


Clinical Skills Syllabus:
Catheterisation, enema/suppository administration and stoma care
Assess living skills
Life skills development
Interpersonal relationships and sexuality: sex education

NS4405 - MENTAL HLTH NURSING AND SPECIAL CLIENT GROUPS DISORD
ECTS Credits: 6

Nursing & Midwifery
Rationale and Purpose of the Module: To aim of this module is to develop students' knowledge, understanding and nursing management of individuals experiencing physical and/or emotional distress as a result of chemical substance misuse/addiction, disordered eating, self-harming/suicidal behaviour and abuse (physical, emotional, sexual). The module also aims to build upon the skills and knowledge gained in years one and two of the programme enabling the student to address complex care management issues in accordance with best practice guidelines

Syllabus: Problems/disorders related to behaviour(s) resulting in physical and/or emotional distress e.g. eating disorders, suicidal behaviour, self-mutilation, violent aggressive behaviour, and sexual, physical, emotional abuse. Dual diagnosis (substance misuse and mental illness), chemical substances of misuse. Theories relating to the module focus disorders epidemiology and predisposing and precipitating factors, nursing care management and prevention. Specialised interventions e.g. risk assessment, harm reduction, relapse prevention, cognitive behaviour therapy, medication management (detoxification, maintenance), restraint, seclusion, special observation and legal requirements according to the Mental Health Act (2001). National and international policies and guidelines for best nursing practice. Contemporary research findings. Family work and theory as it relates to the module focus. Introduction to forensic mental health nursing

Clinical Skills
Communication skills
Motivational interviewing
Observation
Problem solving
Crisis prevention strategies. such as risk assessment and management
End of life care and last offices

NS4421 - THEORETIC BASIS FOR MENTAL HEALTH NURSING

ECTS Credits: 6

Nursing & Midwifery
Rationale and Purpose of the Module: The purpose of this module is to develop Mental Health students appreciation of the importance of a holistic approach to patient care and to develop knowledge and understanding of physical illnesses which are common in mental health care.

Syllabus: The inter-relationship between mental and physical health. The physical health status of persons with mental illness. The role of the nurse in promoting the health of this service user group. The aetiology, signs symptoms, treatment and nursing care of physical illnesses which commonly present...
PA4001 - INTRODUCTION TO PUBLIC ADMINISTRATION 1
ECTS Credits: 6

Politics and Public Admin
Rationale and Purpose of the Module: This module will introduce students to the study of Public Administration. It will identify the characteristics of Public Administration as an academic study and a practitioner focus. It will present the main ideas and concepts in the traditional model of public administration - bureaucracy, politics-administration dichotomy, scientific management - and their application. The module will then explore the rationale for contemporary ideas about public management and governance, reforming public sector organisations and attempts to deliver public services efficiently and effectively.

This module will be offered on the new BA Arts programme

Syllabus: Part 1 Introduction:
What is Public Administration?
Differences between ‘public’ and ‘private’ Characteristics of public goods
The role and functions of government

Part 2 - Traditional Model of Public Administration
Patronage and spoils to the Northcote-Trevelyan reforms
Max Weber and bureaucracy
Woodrow Wilson and the politics-administration dichotomy
Public choice critique

PA4012 - PARA-GOVERNMENTAL ORGANISATIONS
ECTS Credits: 6

Politics and Public Admin
Rationale and Purpose of the Module: To analyse and explore the role and functions of Paragovernmental Organisations (PGO) as instruments of ‘indirect’ public administration generally and within the context of the politico-administrative system in Ireland.

Syllabus: Part A: Paragovernmental Organisations as instruments of indirect administration; State-sponsored Bodies (SSBs) as manifestation of the PGO type in Ireland; commercial (public enterprise) and non-commercial (administrative agency) SSBs; legal, structural and financial characteristics of SSBs; roles of minister, board, management and Houses of the Oireachtas in the structure of accountability of SSBs. The evolving regulatory environment of SSBs. Part B: Economic rationale for government intervention in the economy and the role of public enterprise; review and performance evaluation of public enterprise in Ireland since the foundation of the state; major concepts and trends in the regulation of public enterprise; privatisation and public private partnerships generally and in Ireland

PA4017 - SUB NATIONAL GOV. IN EUROPE: CHALLENGE AND CHANGE
ECTS Credits: 6

Politics and Public Admin
Rationale and Purpose of the Module: Using a comparative and thematic approach (within a Joint European Module subscribed to by 11 European universities) this course aims to explore various systems of subnational government, the changing relationships between the different levels of government and to examine the origin, nature and implications of the challenges facing sub-national governments in Europe.

Syllabus: The salience of sub-national government; evolution of different forms of subnational government; differences between supra-national, national and subnational government and relationships between the different levels of government; theoretical perspectives on the study of sub-national government; state, region and locality in the Anglo, French, Germanic and Scandinavian traditions; recent developments in Central and Eastern Europe; the European dimension of sub-national government; comparative trends in reform; the current challenges and future prospects confronting sub-national governments

PD4003 - ERGONOMICS FOUNDATION
ECTS Credits: 6

School of Design
Rationale and Purpose of the Module: Upon completion of this module students will be able to;
Explain the ergonomics approach.
Compute basic statistical metrics to describe inter individual differences in physical and cognitive abilities.
Apply statistical data describing populations abilities in the design of products or work systems.
Explain the physiological basis of energy liberation in the cardiovascular system.
Understand the basis for human motor control and be able to explain and apply Fitts equation.
Derive an expression to explain information processing rates in humans and apply the theory in the design of displays and controls.

Syllabus: History of Ergonomics
Domains of specialisation in ergonomics.
Human variability and user fit, anthropometry, conducting anthropometric surveys; fitting trials, the normal distribution and statistical aspect of variability, standards in anthropometry.
Minority groups, needs of older and younger people, user centred design, inclusive design, design for all.
Biomechanics of body forces, hand tool design, internal and external forces of the upper limb, muscle fatigue, endurance models, modelling fatigue. Psychophysical studies Wooden and supination, theories of comfort and discomfort, repetitive strain injuries, conducting studies, Ethics and user studies.
PD4005 - ADVANCED MODELLING OF FORM
ECTS Credits: 6

School of Design

Rationale and Purpose of the Module: The module aims to develop students’ skills in expression of organic form in a 3-dimensional digital environment. Enhancing these skills will further augment the learners’ appreciation of complex 3D form and downstream uses of Computer Aided Design in manufacturing, rapid prototyping & digital representation & visualisation.


PD4005 - USABILITY ENGINEERING
ECTS Credits: 6

School of Design

Rationale and Purpose of the Module: Upon completion of this module students will be able to; Plan and conduct usability evaluations of products Critically evaluate the quality of their ergonomics research design Determine and apply relevant ISO standards for usability evaluation Appreciate the principles of inclusively in design Appreciate the implications of the psychology of individual differences on product design Test and apply theories of user experience in product design Use human factors methods to inform the design process to achieve high levels of user satisfaction.

Syllabus: The user and product interaction, introduction to usability, generations of user interfaces, human factors methods to study user interaction, models of usability, usability engineering lifecycles, principles of usable design, designing for usability, methods for usability evaluation, planning and conducting usability evaluations, analysing usability data, reporting on user studies, usability informing design, heuristics, standards and usability, systems analysis of user products, product experience, product attachment, designing for comfort, affective meaning, Kansei methods, observing the user experience, measuring user experience.

PD4024 - DESIGN FOR ENVIRONMENTAL SUSTAINABILITY
ECTS Credits: 6

School of Design

Rationale and Purpose of the Module: To familiarise students with issues relating to energy consumption, and the realisation of current exhaustible engineering activities which is essential for a change towards sustainable production. To present environmental impact assessment and ecological footprinting of products and processes used in the critical realisation of current unsustainable engineering trends. To equip students with abilities to perform environmental audits on products and processes. To outline all relevant legislative requirements relating to environmental aspects of products and processes, which is a key component of an environmental audit. To provide an understanding and realisation of how sustainable design begins with the concept stages of a product.


PD4105 - DESIGN STUDIO 5 (INDUSTRY)
ECTS Credits: 6

School of Design

Rationale and Purpose of the Module: The aim of this module is to build on the design skills developed through the previous Design Studio modules through a series of industry focused projects. These projects, conducted with Industry partners will bring the students through the entire design process from early research and conceptualisation to final design and design for manufacture. The real-world problems will focus on professional practice, current industry requirements and emerging technological trends. To equip students with the skills and capacities to creatively solve real world problems across a wide variety of fields. To introduce tools, techniques and methods applicable to innovation and industrial demands. To practically apply the design process to develop and realise design ideas to a professional standard. To develop and advance design skills in emerging market areas including medical devices, consumer products and electronics. To expand student knowledge and practical application of mechanical reasoning, manufacturing and materials, and design detailing. To develop critical thinking skills and complex problem solving abilities. To develop advanced design skills, including real-world research, ethnography, sketching, model-making, design visualisation, professional practice, communication, prototyping and user testing, advanced human factors. The teaching model will predominantly be a ‘learning by doing process, where a mix of lectures, projects, workshops and design projects will blend to provide students with a mix of practical and applicable professional skills. This approach will teach students core skills needed to identify new opportunities, abstract problems, generate and develop a wide range of solutions, as well as building and realising the most appropriate solutions.

Syllabus: Project based studio classes. Integration and practical application of various different design processes. Advanced Design skills: Sketching, Rendering, Ideation, Concept development, Design Detailing, Manufacturing and Materials, Technology, Design Visualisation,
PD4115 - DESIGN STUDIO 6 (COMMUNITY)
ECTS Credits: 6

School of Design

Rationale and Purpose of the Module: This module facilitates students to see the impact their work will have on individual users and society as a whole. Focusing on team projects and collaborative work, students will work through design issues and complex problems to develop solutions that improve the lives of users and community (both local and international).

To introduce tools, techniques and methods applicable to innovation and effective problem solving.
To develop the skills and capacities for effective team working.
To demonstrate to students the link between design and user behaviour.
To advance design skills, including research skills, sketching, model-making & prototyping, design visualisation, presentation, communication and user testing.
To explore and implement complex real-world research techniques to gather information, and then to apply tools to synthesise, analyse and transform the information into usable design guides.
To allow students to integrate all stages of the design process.
To introduce students to the tools, concepts and techniques underpinning Service Design, Universal/Inclusive Design and Design for Social Innovation.

PH4003 - MECHANICAL ENERGY
ECTS Credits: 6

Physics


Fluid dynamics: Bernoulli equation, equations of motion in integral form, equations of motion in differential form, kinematics, vorticity, potential flow, dimensional analysis, viscous flows, exact solutions, pipe flow, laminar boundary layers, boundary layer solution methods, turbulence. Fluid heat transfer and a thorough understanding of how these disciplines apply to the design and analysis of complex thermal fluid systems.

Applications to Ocean, Hydro and Wind renewable energy systems

PH4005 - INTRODUCTION TO COMPUTATIONAL PHYSICS
ECTS Credits: 6

Physics

Rationale and Purpose of the Module: Physicists at undergraduate level regularly deal with systems that have analytical solutions. However, in many instances analytical solutions are not possible and so these systems require numerical solution. In addition, physicists frequently encounter large data-sets that require analysis that is unfeasible to analyse manually and is beyond the capabilities of a spreadsheet. A physicist should be able to identify these difficulties and implement the appropriate computational methods as necessary.

This module allows students:
- to develop programming skills appropriate to physics.
- to recognise and solve problems from physics that require numerical techniques rather than analytical approaches.
- to develop skills in the application of numerical techniques to physical problems and data analysis.
- to enhance competency in the creation of electronically prepared scientific reports and the associated presentation of data.

Syllabus: [Introduction to computation in physics:] The necessity of numerical techniques in physics; How computers store and manipulate data; storage of numbers and roundoff error; comparison of common programming languages used in physics. [Introduction to Programming:] Basic syntax and structures in a programming language; functions; file reading/writing; data visualisation.


PH4007 - SOLAR AND NUCLEAR ENERGY
ECTS Credits: 6

PH4011 - PHYSICS FOR ENGINEERS 1
ECTS Credits: 6

PH4021 - PHYSICS OF SOLIDS
ECTS Credits: 6

PH4027 - WIND, OCEAN AND HYDRO ENERGY
ECTS Credits: 6
Physics

Rationale and Purpose of the Module: This module is designed to provide such students with a firm grounding in disciplines. This one semester course is specifically intended to provide students with a firm grounding in understanding many processes and phenomena. An understanding of physics is essential in describing and understanding many processes and phenomena.


Hydro (pressure head systems, dams, pumped storage, tidal barrages), Wave energy devices (principle of work, classification), Tidal stream devices (principle of work, classification), Ocean current devices (principle of work, classification) Offshore wind (principle of work, classification), Energy farms installation operation, Storm defence Ocean Energy Non Renewable, off-shore oil & gas, exploration, drilling, distributed fields, flexible risers, offshore industry technology - sonar and seismic, underwater technology - ROV - AUVs, pipelines, production platforms survey vessels. Marine hydrates


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PH4031 - PHYSICS FOR GENERAL SCIENCE 1
ECTS Credits: 6

Physics

Rationale and Purpose of the Module: An understanding of physics is essential in describing and understanding many processes and phenomena associated with chemical and life-science related disciplines. This one semester course is specifically designed to provide such students with a firm grounding in basic physics illustrated and reinforced with chemical, life and sports science related examples and applications.

Syllabus: Mechanics: units; kinematics; dynamics; motion in a circle; statics; the standard human; energy; momentum; simple harmonic motion; waves; sound and hearing. Materials: elasticity; pressure; buoyancy; surface tension; fluid dynamics. Heat: temperature; gases; phases; heat transfer; thermodynamics and the body, thermal conductivity. Electricity: static electricity; electric force and fields; electric potential and energy; dc circuits; radio frequency radiation; physiological effects of electricity. Magnetism: nmr, focus on medical imaging. Generator and motor. Optics: light; geometrical optics; physical optics; electromagnetic spectrum; Lasers; the eye and vision. Radiation: atoms; nucleus; ionising radiation; biological effects.

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PH4037 - ENERGY RESOURCE ASSESSMENT
ECTS Credits: 6

Physics


Prerequisites: PH4102

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PH4051 - MEASUREMENT AND PROPERTIES OF MATTER
ECTS Credits: 6

Physics


Prerequisites: PH4102

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PH4041 - OPTICS
ECTS Credits: 6

Physics

Rationale and Purpose of the Module: The aim of this course is to develop and extend the students knowledge of the principles of physical optics and introduce the students to contemporary optics.

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PH4102 - MATTER
ECTS Credits: 6

Physics

Rationale and Purpose of the Module: The purpose of this module is to first introduce fundamental principles of physical measurement and data analysis which are important throughout the course and to introduce the mechanical and thermal properties of solids, liquids and gases.


**PH4061 - QUANTUM MECHANICS**  
ECTS Credits: 6  
Physics

**Rationale and Purpose of the Module:** The purpose of this module is to extend the students understanding of quantum mechanics and to introduce students to applications of quantum mechanics in solid state physics.


Prerequisites: PH4171, PH4042, PH4132

**PH4071 - SEMICONDUCTORS 1**  
ECTS Credits: 6  
Physics

**Rationale and Purpose of the Module:** The purpose of this module is introduce students to the fundamentals of semiconductor process technology focusing on silicon technology and integrated circuit processes.

**Syllabus:** Semiconductor technology: overview of advances in integrated circuits, the road map, Moores law. General nature of semiconductor materials: elemental materials and their uses in research and industry, compound materials and alloys and their applications, influence of purity on electrical properties of semiconductors. Structure of semiconductors: amorphous, crystalline and polycrystalline solids, unit cells, lattice types, body centred cubic, face centred cubic, the diamond lattice, Si and Ge, Miller indices. Electrical properties: contribution of mobility and free carrier density to resistivity, electrical properties of conductors, semiconductors and insulators. Semiconductors: pure semiconductors, important elements from group 3, group 4 and group 5 of the periodic table, valence electrons, covalent bonding, p-type semiconductors and n-type semiconductors, energy levels for p-type and n-type semiconductors, intrinsic energy level, intrinsic carrier density, thermal equilibrium, carrier lifetime. Doping of silicon: donors and acceptors, majority carriers and minority carriers, hot point probe, 4-point probe sheet resistance, carrier transport. Lithography: lithography processes (light sources, exposure systems, photoresist), aerial image, latent image, relief image, pattern definition, pattern transfer (etching, deposition, implantation etc.). Optical lithography techniques: optical resists, key resist parameters, positive and negative resist, DQX system and deep UV system. Resist processing: priming, spinning, baking, exposing, developing, hard baking, stripping. Exposure: types of exposure (UV light to deep UV, X-rays, electrons, ions), method of exposure, development (positive, negative). Printing: Fresnel system, contact and proximity printing, Fraunhofer system, projection printing, advantages and disadvantages. Advanced lithography: focused ion beam, electron beam, etc. Thermal oxidation of silicon: the oxidation process, type of furnaces, wet oxidation, dry oxidation, factors influencing oxidation rates, silica film thickness measurements. Thin film deposition: evaporation, sputtering, chemical vapour deposition. Diffusion: diffusion processes, constant source diffusion, limited source diffusion, solid solubility limits. Epitaxial silicon deposition: LPCVD amorphous silicon, importance of epitaxy. Ion implantation: implantation technology, channelling, lattice damage and annealing.

Prerequisites: PH4061, PH4021

**PH4091 - PHYSICS OF MODERN MEASUREMENT**  
ECTS Credits: 6  
Physics

**Rationale and Purpose of the Module:** The purpose of this module is to provide an introduction to the physical principles and applications of advanced surface analytical techniques.

**Syllabus:** Microscopy: image formation, resolution, light microscopy, near-field scanning optical microscopy (NSOM), scanning electron microscopy (SEM), transmission electron microscopy (TEM), scanning transmission electron microscopy (STEM), scanning tunnelling microscopy (STM), scanning force microscopy

**PH4081 - NANOTECHNOLOGY 1**  
ECTS Credits: 6  
Physics

**Rationale and Purpose of the Module:** The aim of this course is to combine basic science of size effect in materials in the micro to nanoscale dimension leading to various cutting-edge applications. The main objective is to introduce the students about the scientific importance and technological potential of developments in micro- and nano structuring of materials.
Rationale and Purpose of the Module: This module develops the student's knowledge of atomic and molecular physics, particularly where these are relevant to spectra and laser physics. Based on this the module introduces the fundamentals of laser physics and laser applications including holography.


Prerequisites: PH4132, PH4041

PH4467 - SOLID STATE PHYSICS 1
ECTS Credits: 6

Physics

Rationale and Purpose of the Module: The purpose of this module is to enhance the students' understanding of key concepts in solid state physics and the quantum theory of solids.

Syllabus: Crystal dynamics: sound waves, the one dimensional crystal, normal modes, lattice vibrations and phonons, Bloch waves. Semiconductors: electrons and holes, intrinsic and extrinsic behaviour, Fermi energy, band structure, effective mass, excitons and plasmonics. Transport properties and electrodynamics of metals: conductivity, Hall effect, cyclotron resonance, Debye

Prerequisites: PH4061

PH4613 - FORCES, POTENTIALS AND FIELDS
ECTS Credits: 6

Physics

Rationale and Purpose of the Module: The purpose of this module is to enhance students understanding of key concepts and models associated with forces, potentials and fields. The objectives are to introduce and model kinematics, dynamics, planetary dynamics, fluid mechanics and electromagnetism using concepts such as magnitude, direction, rate-of-change, gradient and fields.

Syllabus: Syllabus:
Kinematics: review of vectors and scalars, displacement, velocity, flux, acceleration, rotation, frequency, angular velocity, planes of reference, rotation of axes, cylindrical and spherical coordinates. Forces: stress, strain, pressure, tension, electricity, Gauss's Law, magnetism, work, potential, conservation of energy. Dynamics: Newton’s Laws, forces as a function of time and space; rate of change of forces and other vectors, tangential forces, centripetal and centrifugal forces. and fields: visualisation of scalar and vector fields, maxima/minima, contour maps, smoothness, gradient, curvature, gravity, relativity, electromagnetism, divergence and vortices and their significance for electromagnetism, and fluid mechanics, Maxwell’s Equations.

Prerequisites: MA4602, PH4131, PH4102

PH5091 - PHYSICS OF MATERIALS
ECTS Credits: 6

Physics

Rationale and Purpose of the Module: The purpose of the module is to introduce the student to the structure and properties of solid materials. The objectives are to discuss the major classes of solids and their properties and applications, and to present the physical principles needed for an understanding of the observations


Applications of materials: ferrous & non-ferrous alloys, glasses & ceramics, plastics & elastomers.

PH5093 - PHYSICS OF ADVANCED METROLOGY
ECTS Credits: 6

Physics

Rationale and Purpose of the Module: The purpose of the module is to provide an introduction to the physical principles and applications of advanced surface analytical techniques.

Syllabus: Microscopy: image formation, resolution, light microscopy, near-field scanning optical microscopy (NSOM), scanning electron microscope (SEM), transmission electron microscope (TEM), scanning transmission electron microscope (STEM), scanning tunnelling microscopy (STM), scanning force microscopy (SFM). Diffraction and scattering: elastic and inelastic scattering, Bragg’s law, the reciprocal lattice, Laue equations, X-ray diffraction (XRD), neutron diffraction, selected area electron diffraction in the transmission electron microscope (SAD), electron probe X-ray microanalysis (EPMA), extended x-ray absorption fine structure (EXAFS), surface extended x-ray absorption fine structure and near edge x-ray absorption fine structure (SEXAFS/NEXAFS), low-energy electron diffraction (LEED), reflection high-energy electron diffraction (RHEED), particle-induced x-ray emission (PIXE), x-ray fluorescence (XRF). Spectroscopy: vibrations in molecules and solids, selection rules, energy dispersive x-ray spectroscopy in the scanning electron microscope (EDS), electron energy-loss spectroscopy in the transmission electron microscope (EELS), x-ray photoelectron spectroscopy (XPS), ultraviolet photoelectron spectroscopy (UPS), Auger electron spectroscopy (AES), Fourier transform infrared spectroscopy (FTIR), Raman spectroscopy, nuclear magnetic resonance (NMR), Rutherford backscattering spectroscopy (RBS), secondary ion mass spectroscopy (SIMS), inductively coupled plasma mass spectroscopy (ICPMS), positron annihilation spectroscopy (PAS).

PH5094 - NANOSCIENCE AND TECHNOLOGY 1
ECTS Credits: 6

Physics

Rationale and Purpose of the Module: The purpose of this module is to enhance the students’ understanding of key concepts in solid state physics and the quantum theory of solids.

**Rationale and Purpose of the Module:** The aim of this course is to apply the basic science of size effects in materials in the micro to nanoscale dimension to various cutting-edge applications. The main objective is to introduce the students to the scientific importance and technological potential of developments in micro- and nano structuring of materials.

**Syllabus:**

- **Physics**
  - General nature of semiconductor materials: elemental properties, Energy bands, Localized particles; Properties of individual particles: Metal nanoclusters, Semiconductor nanoparticles, Rare gas and molecular clusters and methods of synthesis.
  - Methods of measuring properties: Structure, Microscopy and Spectroscopy;
  - Carbon nanostructures: Carbon molecule, Carbon clusters, Carbon nanotubes, application of carbon nanotubes;
  - Bulk nanostructured materials: Solid dispersed nanostructures; Nanostructured Crystals, Nanostructured ferromagnetism: Basics of ferromagnetism, Effect of bulk nano-structuring of magnetic properties, Dynamics of nanomagnets, Ferrofluids, nanopores containment of magnetic particles, Nanocarbon ferromagnets, Giant and Colossal magnetoresistance;
  - Quantum Wells, Wires and Dots: Preparation of quantum nanostructures, Size and dimensionality effect, Excitons, Single electron tunnelling;
  - Applications: Nanomachines and Devices; Microelectromechanical Systems (MEMS), Nanoelectromechanical Systems (NEMS), Molecular and Super molecular switches, Magnetoelectronics Applications: memory elements and devices, Nano magnetic sensors and actuators

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**PM5098 - SEMICONDUCTOR PROCESSING 1**

**ECTS Credits:** 6

**Physics**

**Rationale and Purpose of the Module:** The purpose of this module is to introduce students to the fundamentals of semiconductor process technology focusing on silicon technology and integrated circuit processes.

**Syllabus:**

- Semiconductor technology: overview of advances in integrated circuits, the road map, Moores law. General nature of semiconductor materials: elemental materials and their uses in research and industry, compound materials and alloys and their applications, influence of purity on electrical properties of semiconductors. Structure of semiconductors: amorphous, crystalline and polycrystalline solids, unit cells, lattice types, body centred cubic, face centred cubic, the diamond lattice, Si and Ge, Miller indices. Electrical properties: contribution of mobility and free carrier density to resistivity, electrical properties of conductors, semiconductors and insulators.

**Semiconductors:**

- Pure semiconductors, important elements from group 3, group 4 and group 5 of the periodic table, valence electrons, covalent bonding, p-type semiconductors and n-type semiconductors, energy levels for p-type and n-type semiconductors, intrinsic energy level, intrinsic carrier density, thermal equilibrium, carrier lifetime. Doping of silicon: donors and acceptors, majority carriers and minority carriers, hot point probe, 4-point probe sheet resistance, carrier transport.

**Lithography:**

- Lithography processes (light sources, exposure systems, photoresist), aerial image, latent image, relief image, pattern definition, pattern transfer (etching, deposition, implantation etc.). Optical lithography techniques: optical resists, key resist parameters, positive and negative resist, DNQ system and deep UV system.

**Resist processing:**

- Priming, spinning, baking, exposing, developing, hard baking, stripping. Exposure: types of exposure (UV light to deep UV, X-rays, electrons, ions), method of exposure, development (positive, negative).

**Printing:**

- Fresnel system, contact and proximity printing, Fraunhofer system, projection printing, advantages and disadvantages. Advanced lithography: focused ion beam, electron beam, etc.

**Thermal oxidation of silicon:**


**Ion implantation:**

- Implantation technology, channelling, lattice damage and annealing.

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**PM4017 - HUMAN RESOURCE PRACTICE**

**ECTS Credits:** 6

**Personnel & Employment Relations**

**Rationale and Purpose of the Module:** This module examines both the role of the HR function in the management of people at work and the importance of managing people in contributing to organisational effectiveness. This module is designed to provide students with an appreciation and understanding of Human Resource Management (HRM) in organisations. There is a strong focus on contextualising HRM within the prevailing macro environment, to demonstrate how this influences the range of HR policies and systems enacted by organisations.

The syllabus covers core issues surrounding managing people at work. In so doing, the module starts with a consideration of key labour market issues in Ireland and how these affect the nature of HRM in organisations. Core HR activities are next explored including the processes of human resource planning, recruitment and selection. The module then examines critical elements of managing and rewarding performance, career development, and developing people at work. The nature of work is set down and finally, the link between CSR and HRM is highlighted.

**Syllabus:**

- The syllabus covers core issues surrounding managing people at work. In so doing, the module starts with a consideration of key labour market issues in Ireland and how these affect the nature of HRM in organisations. Arising from a labour market analysis, core HR activities are next explored including the processes of human resource planning, recruitment and selection. The module next examines critical elements of managing and rewarding performance, career development, and developing people at work. The nature of work is set down and finally, the regulatory environment for HRM in Ireland is indicated.

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**PM4013 - PRINCIPLES OF HUMAN RESOURCE MANAGEMENT**

**ECTS Credits:** 6

**Personnel & Employment Relations**

**Rationale and Purpose of the Module:** This purpose of this module is to develop practical skills/capabilities considered essential for HR practitioners. These skills are primarily in the key areas of selection, appraisal, discipline and grievance and applying regulations governing HR to all processes and activities. Another core purpose of the module is to increase the knowledge and skill and overall capability of the participants in key operational areas of HR such as performance management, health and safety, employment regulation, employee welfare issues.
Syllabus: Overview of key HR processes; key operational areas: selection, performance management conflict, key regulatory considerations; key communication skills revisited - active listening, questioning styles, recording information; job analysis; recruitment process - designing job descriptions, person specifications; sourcing applicants, interacting with recruitment agencies, application forms; evaluative standards for selection methods: reliability, validity, practicality, integration, interpretability; selection methods: references; selection process - short listing, designing matrices, designing interview assessments, interviewing techniques, applying appropriate communication skills to selection interview; individual characteristics and bias; preparing and setting up interview; regulatory considerations, documentation; performance review - preparation, documentation, conducting the performance review, follow up; workplace counselling; disciplinary interviewing.

Prerequisites: PM4013

PM4027 - SOCIAL PSYCHOLOGY OF ORGANISATIONS
ECTS Credits: 6
Personnel & Employment Relations

Rationale and Purpose of the Module: This Module seeks to present a broad introduction to social psychology, the scientific study of human social influence and interaction. It provides basic exposure to social psychological issues using the organisation as an operational paradigm for generating understanding and insight. Perspectives from social psychology are drawn upon to examine aspects of contemporary social and organisational life. This module aims to give a critical understanding of current social psychology research and develop a reflective understanding of key organisational developments.

At the end of the module students should have a sound knowledge of research in social psychology in the organisational context and will be expected to be able to apply these ideas, and use them to understand and address relevant social issues.

Syllabus: The Nature and History of Social Psychology; Approaches to the Study of Social psychology; Personal and Social Identity in Workplaces; Self-awareness and Self-regulation; Social influence, Conformity, Compliance and Obedience; Helping Behaviours and Organisational Citizenship, Pro-social, Anti-social and Withdrawal Behaviour; The Role of Attribution and Cognitive Dissonance in Organisational Decision-making; Stereotyping and Prejudice in Employment and Workplace Interactions.

Prerequisites: PM4022

PM4035 - THE PSYCHOLOGY OF WORK
ECTS Credits: 6
Personnel & Employment Relations

Rationale and Purpose of the Module: The module aims to enable students develop knowledge and skills in psychology (both as a discipline and as a professional field) applied to work and organisations. It aims to develop knowledge and skills of understanding individuals in context, considering cognitive, emotional, motivational and behavioural responses to varying working environments and contexts. It aims to develop theoretical and applied knowledge about key psychological concepts and theories concerning work, the workplace, and working life.

Syllabus: 1 Introduction to Work & Organisational Psychology: Psychology as a Science: The art of thinking critically in an applied field
2 Studying Individuals at Work
   Context & Behaviour
   Cognition
   Motivation
   Emotion
3. Taking an Active Approach to Work
   Active Behaviour: Adaptive and proactive behaviour
   Proactive motivation
   Proactive cognition
   Actively managing emotions at work
4. Staying Healthy at Work
   Health Cognitions: Thinking Healthy
   Emotions: Coping with work stress
   Behaviour: Fatigue & recovery
   Motivation: Work engagement
   Environment: Job Demands & Job Control
5. Staying Positive at Work
   What is positive psychology?
   Behaviour: Flourishing

PM4055 - CRITICAL PERSPECTIVES ON EMPLOYMENT RELATIONS
ECTS Credits: 6
Personnel & Employment Relations

Rationale and Purpose of the Module: To provide an overview of the evolution and contemporary nature of employment relations, with specific focus on Ireland.

To enable students to understand and analyse workplace mechanisms for employee voice.

To enable students to analyse case studies on employment relations and develop report writing skills.

To understand the role and behaviour of various actors in employment relations.

To understand employment relations in an international and comparative context.

Syllabus: Theoretical perspectives on employment relations - unitarism, pluralism, and radical theories. International and comparative employment relations. Employee voice - involvement and participation, collective bargaining, non-union firms. The actors and employment relations - trade unions and employment relations, management approaches to employment relations, state approaches to employment relations.

PM4603 - EMPLOYEE RELATIONS FOR ENGINEERING AND SCIENCE
ECTS Credits: 6
Personnel & Employment Relations

Rationale and Purpose of the Module: Enable students to understand the nature of employee relations at work. Demonstrate familiarity with approaches to managing and motivating employees. Identify the role and functions of trade unions and employer organizations. Identify the appreciation of the role of the state in employee relations and in particular the role of the labour court. Promote a clear understanding of the legal nature of the contract of employment, and. Provide an overview of the implications of employment law for the management of the employment relationship. Review the provisions of dismissals, equality, health & safety and other employment legislation. Allow students to appreciate the role of national and workplace level partnership.

Syllabus: The employment relationship; perspectives on the business enterprise; the individual and work groups; the basics of recruitment and selection; motivation techniques; job design; worker participation; team work and its development; effective supervisory management; discipline and grievance administration; communication in employee relations; management trade unions shop stewards; pay bargaining and negotiation; conflict and its management; the labour court and the labour relations commission; employment law û the contract of employment; unfair dismissal, equality, health and safety their implications for the conduct of employee relations.

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PO4011 - INTRODUCTION TO GOVERNMENT AND POLITICS
ECTS Credits: 6

Politics and Public Admin

Rationale and Purpose of the Module: This module provides an introduction to the study of politics and establishes a foundation for other politics modules that may be taken by students in the future. It is intended as a practical guide to some of the main concepts and vocabulary of political science. As such, the module provides an introductory guide to important themes and issues related to the study of politics, such as the state, regime types, and political change and behaviour. It also introduces students to some of the study skills that they need to complete assignments and assessment in the area of politics.

Syllabus: The module is taught through a combination of lectures, classes and on-line exercises that each introduce students to justifying power: the legitimation of authority; The origins of the modern state; researching politics; Essays and essay conventions; State power and its critics; State failure and its problems: revolution; State failure and its problems: state failure in the modern world; Democracy - the basic principles; Democracy - the basic types; Where does democracy come from?; Forms of democratic government and their outcomes; Political parties and their functions; Electoral systems and parties; Pressure politics in democracies: who has influence and why? Non-democratic regimes - authoritarianism, totalitarianism and the rest. Concepts and methods of political analysis including theoretical perspectives within International Relations (IR) - Realism; Liberalism; Structuralism; Critical Theory; Post-Modernism; Constructivism; Feminism. It then introduces the major aspects of study within IR - Power; Security; War and Peace; Foreign Policy and Diplomacy; International Political Economy; International Organisations

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PO4013 - GOVERNMENT AND POLITICS IN IRELAND
ECTS Credits: 6

Politics and Public Admin

Rationale and Purpose of the Module: To introduce the principal institutions of Irish government and politics and to examine their relationship to Irish society.

Syllabus: Historical introduction to the economic, cultural, and social background of Irish politics; economic, social and political change; Irish political culture; constitutional development; development of political parties and evolution of the party system; electoral behaviour; social bases of party support; overview of the principal political institutions, including the presidency, the Oireachtas, the Government, the Taoiseach and the civil service.

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PO4018 - INTERNATIONAL RELATIONS
ECTS Credits: 6

Politics and Public Admin

Rationale and Purpose of the Module: Provides an overview of some of the theoretical debates and issues that have underpinned the study of International Relations (IR). Theoretical perspectives such as Realism, Liberalism and Structuralism will be introduced and this will allow students to apply these to the arena of world politics and to processes such as the interactions of states, the workings of International Organisation and the global economy

Syllabus: The module provides an introduction to the theoretical perspectives within International Relations (IR) - Realism; Liberalism; Structuralism; Critical Theory; Post-Modernism; Constructivism; Feminism. It then introduces the major aspects of study within IR - Power; Security; War and Peace; Foreign Policy and Diplomacy; International Political Economy; International Organisations

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PO4023 - COMPARATIVE EUROPEAN POLITICS
ECTS Credits: 6

Politics and Public Admin

Rationale and Purpose of the Module: This course provides an introduction to the comparative study of European politics. It provides students with the opportunity to study political trends across Europe, to identify similarities and differences within different countries, systems and regions, and to develop their ability to conduct comparative political analysis.

NB This course will mainly draw on Western and Central European political systems

Syllabus: The basic themes of the course are, first, the commonalities and, secondly, the particularities, of politics and government among West European states û due largely to their similar yet different trajectories of development, and to the way in which they influence each other. We explore, for example, why politics in some West European countries is very stable, even predictable, whereas in other countries politics is highly fractious; why some countries have single-party governments whilst others are (almost always) governed by complex coalitions; why some politics seem to be well-governed whereas governance seems more haphazard in others. Note, too, that an understanding of politics and government in West European states tells us much about what is involved in building democracy in the new states of Eastern and Central Europe, and indicates some of the difficulties entailed in European integration û both of which are areas of study in third-year courses.
Prerequisites: PO4011

PO4027 - INTERNATIONAL ORGANISATIONS AND GLOBAL GOVERNANCE
ECTS Credits: 6

Politics and Public Admin

Rationale and Purpose of the Module: To examine the range of international organisations that influence global politics, and to assess their role in running the global political economy.

Syllabus: The origins of international organisations, and their place in liberal internationalist thought; the successes and failures of the League of Nations system; the United Nations system and its internal processes; regional organisations; non-governmental organisations and global governance; international organisations and the search for political and military security; functional-technical cooperation at the regional and global level; global governance and the post-Cold War global political economy.

Prerequisites: PO4004

PO4032 - RUSSIAN POLITICS
ECTS Credits: 6

Politics and Public Admin

Rationale and Purpose of the Module: The purpose of this module is to help students explore issues in Russian political development over the last century according to their interests. Students have free choice of which topics they study so that the learning outcomes of the module will be individualized.

In addition to the knowledge gained by students about the USSR and Russia, this module will help students to develop their analytical and research skills. All students, however, will have to search out information on contemporary Russia in their own time and will learn how to locate information in the library and on the WWW, will learn how to judge the merits of different information sources, will learn how to construct arguments from primary materials that they have and how to relate such materials to existing academic literatures. They will also have to learn how to interpret academic literature in changing circumstances, to relate it to a developing politics and judge it against change.

Syllabus: This module is a reading course, students consult over and decide in consultation with the lecturer over the topics in Soviet and Russian politics that they study and write on. These topics include may include, but are not limited to:

- Leninism and Bolshevism as political theory
- The 1917 revolution
- The relationship of Leninism and Stalinism
- The development of the Stalinist system
- The great terror
- Khrushchev and destalinisation
- The institutions of the USSR: the party-state system
- Theories of the development of the Soviet system
- The political economy of the USSR
- Soviet foreign policy
- The nature of the USSR (various approaches can be studied including totalitarianism, Marxist approaches etc)
- The Gorbachev reforms
- Why did the USSR collapse?
- Soviet legacies and the post-Soviet policy agenda
- An analysis of the political economy of the new Russia
- Russia and the resource curse
- The Putin programme: reform or retrenchment?
- An analysis of the political economy of the new Russia
- Russia in comparative perspective

Prerequisites: PO4011, PO4022

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PO4043 - INTRODUCTION TO IRISH POLITICS
ECTS Credits: 6

Politics and Public Admin

Rationale and Purpose of the Module: This course is designed to build on and develop the knowledge gained in earlier politics modules by examining the politics and society of a single country in more depth. The course will apply a range of alternative analytical perspectives from political science and the sub-disciplines of political economy, political sociology, public administration and public policy, to the study of the government and politics of Ireland.

At a practical level, this course aims to:

- Introduce students to the government and politics of Ireland
- Develop analytic and evaluative skills for examining the processes of government and politics
- Understand the historical and political development of the Irish state, and be able to identify key influences in that development
- Be familiar with key institutions and their workings

Syllabus: The module will contain three main components: the institutional framework of government and administration; the executive, legislature and bureaucracy; political behaviour - including government, parties, party system, electoral behaviour and political culture; and an analysis of the public administration and ideas in political theory.
policy making - looking at territorial administration and sub-national government, economic policy-making and the advent of partnership government; the welfare state and social policy; plus Ireland’s role in the EU and beyond.

PO4051 - INTRODUCTION TO POLITICS AND INTERNATIONAL RELATIONS I
ECTS Credits: 6

Politics and Public Admin

Rationale and Purpose of the Module: This module will introduce students to the themes and issues that exist in the study of Politics and International Relations. It will provide the first part of an introduction that will look at the basics of the study of Politics and International Relations. It will look to critical concepts such as Governance and Government, Political Ideology, The State, Nations and Party Systems. The module will be offered in the new BA Arts programme

Syllabus: Introduction to Politics and International Relations
Government/Governance
The Modern State/Types of States
Political Ideology
The State System
Political Parties
Pressure Groups
Understanding Democracy
The State and the Economy
The State and International Organisations

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PO4117 - POLICY-MAKING IN THE EUROPEAN UNION
ECTS Credits: 6

Politics and Public Admin

Rationale and Purpose of the Module: The module is being created as an addition to the elective choice for students in semesters 7 and 8 on BA Politics and International Relations and on AHSS programmes where Politics is offered as an option.

It better reflects the subject expertise of current teaching staff in this area than existing modules.

Syllabus: This module takes a detailed look at the policy-making process of the EU. Few EU policies directly redistribute money, yet even if they sometimes seem to focus on rather arcane technical issues, they often have profound consequences for the legal rights and the welfare of individual citizens, the competitiveness of particular companies or entire industries, and the social, economic, and democratic development of Europe as a whole. If we want to evaluate the functioning of the EU as a democratic political system, we need to know who is involved in the formulation and implementation of those policies, to what extent these actors and the structural characteristics of the process influence the shape and content of those policies, and why different actors and structural characteristics vary in their influence on policy outcomes. These are the types of questions discussed in this module.

PO5004 - GRADUATE SEMINAR IN DEVELOPMENT
**Rationale and Purpose of the Module:** This module will introduce students to the concept of development and ideas about how it should be pursued. It will examine the ideas and imperatives shaping development policy, such as market led, sustainable, rights-based and gender-equitable approaches and will explore the contradictions or intersections between these approaches. It will then set out key development challenges, including climate change, alternatives to development and the problem of conflict. It will discuss the particular challenges presented by 'fragile states' and will explore the relationships between development policy, conflict and other development challenges in depth, analysing and comparing cases.

**Syllabus:**

**Introduction:** What is development? exploring concepts and theories

Part 1: Contemporary approaches to development: Good governance; sustainable development; rights-based development, gender and development, human security

Part 2: Contempotary challenges to development: Climate change and environmental threats, The 'conflict trap'? exploring the linkages between development and violence; social movements, alternatives and resistance to globalisation;

Part 3: Development in 'fragile states': case-studies.

**PO5013 - CONFLICT ANALYSIS**

**ECTS Credits:** 9

**Politics and Public Admin**

**Rationale and Purpose of the Module:** This module will undertake a comprehensive review of the literature on armed conflict in the international and domestic arenas. Much of this literature is from the field of political science but this module will also draw upon insights from other disciplines. Students will analyse leading and critical theories of armed conflict, their variables, their causal claims, and, of central importance, their ability to explain contemporary and historical cases of conflict and predict possible future conflicts. This survey of the literature on this topic will utilize scholarship employing both qualitative and quantitative methodologies. This module is designed primarily for postgraduate students who seek to understand (and, through their own scholarship, contribute to) the literature on armed conflict.

**Syllabus:**

**Levels of analysis.**

Individual level theories of armed conflict: misperception theory, evoked sets, national role conceptions, historical analogies, prospect theory

Group level theories of armed conflict: organizational process model, group think, bureaucratic politics model

State level theories of armed conflict: democratic peace theory, diversionary war theory, death watch theory, public opinion-based theories, regime-based theories

Systemic level theories of armed conflict: neorealism, hegemonic stability theory, balance of power theory, offense-defence theory, cultural realism, power preponderance theory, status discrepancy theory, power transition theory

Environmental theories of armed conflict: greed-based theories vs. grievance-based theories, environmental degradation-based theories, environmental disaster-based theories.

Theories of genocide and the motivations for humanitarian interventions.

The future of wars and other armed conflicts.

**PO5014 - MULTI LEVEL GOVERNANCE: CONCEPTS AND PRACTICE**

**ECTS Credits:** 9

**Politics and Public Admin**

**Rationale and Purpose of the Module:** The aim of this module is to enable students to understand the significant changes that have taken place in processes of governing at international, national and local levels. The module explores the manner in which the interaction of various levels and the involvement of diverse actors have impacted on politics, policy and policy. The meanings, origins and various applications of the phenomenon of multi-level governance (MLG) are analysed in order to assess its normative and empirical impact. Particular attention is paid to the emergence of MLG as a significant framework of policy-making in the EU as well as its effects on domestic and global contexts.

**Syllabus:** This module explores the distinctions between government and governance and considers the conceptualisations and implications of MLG. Topics include: Government and governance; new modes of governance; MLG, theory or explanation; MLG as compound democracy; MLG in the international policy arena (e.g., climate change, finance, tobacco control); MLG in the EU; MLG in the domestic context. The topics will be considered from both theoretical and applied perspectives and will direct students to the vast array of interpretations and applications of the MLG phenomenon.
constructivism. This will be achieved through a close reading of a number of international relations texts, each of which cover theories, issues, and debates that are core to our understanding of international affairs.

**Syllabus:** The assessment is set up so that students can begin to specialise in certain aspects of IR, while keeping an eye on the wider history and theoretical context of the discipline. The reading lists have been designed to familiarise students with the various approaches that are used to explain IR, and the seminar discussions will apply these theories to events in the international sphere. As a result it is important for each student to read the required readings before class.

By the end of the module students will have developed a strong grasp of the nature of IR theories, and be able to use their understanding of these theories to construct complex intellectual arguments. The module content will be particularly valuable to students when they come to construct the theoretical framework for their dissertation.

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**PO5017 - GRADUATE SEMINAR IN INSTITUTIONS AND POLICIES OF THE EUROPEAN UNION**

**ECTS Credits: 9**

**Politics and Public Admin**

**Rationale and Purpose of the Module:** The aim of this module is to develop students’ understanding of how the European Union formulates and adopts policies. Special attention is given to the roles and organisational structures of the different institutions involved in the EU policy-making process. The module presents theories of integration and policy-making, the internal organisation, functions, and powers of the main institutions of the EU, and the inter-institutional decision-making process through which those institutions interact to shape the content of policies.

**Syllabus:** The module introduces students to the institutions and policies of the European Union. The first part of the module is devoted to the description and explanation of the internal workings of the European Commission, the European Parliament, and the Council of the European Union. It will also cover the interaction of those institutions in the EU’s legislative decision-making process. The second part of the module focuses on how policy decisions are made in different policy sectors, highlighting distinctions in institutional structures and actor configurations. Theories aimed at explaining important sector-specific decisions and developments are also discussed. Examples will be drawn from a variety of policy areas, such as the common agricultural policy, justice and home affairs, the internal market, environmental policy, and economic and monetary policy.

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**PO6031 - CONTEMPORARY ETHICAL ISSUES**

**ECTS Credits: 9**

**Politics and Public Admin**

**Rationale and Purpose of the Module:** To introduce postgraduate students to the main problems and approaches in ethics through a discussion of some of the pressing ethical issues faced in contemporary societies, such as euthanasia, same-sex marriage, positive discrimination, animal welfare etc. The purpose of the module is not only to introduce students to the main arguments around these specific problems but also to enable them to analyse and construct normative arguments in a rigorous and sensitive manner. This module will be offered as an elective to students in the new MA programme in Ethics and International Affairs, thus allowing them to specialise in political theory.

**Syllabus:** How ought we to live together? What rights do individuals hold? When should the state interfere in our lives? These are some of the general ethical questions that this module deals with, with an application to some of the public policy issues that are relevant today, such as abortion, euthanasia, same-sex marriage, conscientious objection, affirmative action etc. They will be approached from a philosophically/ethical perspective and both sides of the argument will be considered for each question.

Week 1 - Introduction
2. Week 2 - The 'trolley problem
3. Week 3 - Abortion
4. Week 4 - Euthanasia and assisted suicide
5. Week 5 - Conscientious objection to medical procedures
6. Week 6 - Surrogate motherhood
7. Week 7 - The moral status of animals
8. Week 8 - Paternalism and drugs
9. Week 9 - Responsibility and health care
10. Week 10 - Positive discrimination/affirmative action
11. Week 11 - Same-sex marriage
12. Week 12 - Revision/Additional topic

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**PR4010 - ANATOMY 1**

**ECTS Credits: 12**

**Clinical Therapies**

**Rationale and Purpose of the Module:** This module is designed to enable students to understand the structure and function of the musculoskeletal system of the lower extremity, pelvis and spine; abdomen; the cardiovascular system and the respiratory system. This module forms the basis for understanding the implications of pathophysiological changes within these structures that will be studied in modules during years 2-4.

The total hours scheduled will be 96 (based on 3 hours lectures, 3 hours labs and 2 hours tutorials over 12 weeks)

**Syllabus:** Introduction to nomenclature and general concepts of anatomy, classification of bones, joints and muscles; cervical, thoracic and lumbar spine and thorax (sternum, ribs and thoracic vertebrae). The integumentary system (structure & function). Afferent and efferent control of muscle tone and posture; myotomes and dermatomes and reflexes LL; pelvic bones and pelvic floor and perineum; bony skeleton, muscle attachments, joints, nerve supply of the lower limb, analysis of movements of the lower limb, muscle participation and nature of contraction

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**PS4011 - SOCIAL PSYCHOLOGY 1**

**ECTS Credits: 6**

**Psychology**

**Rationale and Purpose of the Module:** To provide a broad introduction to the field of social psychology which will be built on in future modules. The lectures will provide a framework around a range of topics in social psychology.

**Syllabus:** Social psychology is a field of psychology that considers the nature, causes, and consequences of human social behavior. The module will cover theories, models, key concepts and issues related to attitudes and behaviour, social influence, intra and inter group processes, pro-social behaviour, and affiliation, attraction and love.
Rationale and Purpose of the Module: This module provides students with a broad introduction to the historical evolution, issues, debates, themes and theories in psychology. The course will provide a good grounding in a range of theoretical perspectives in psychology including attention in particular to personality and biological psychology.

Syllabus: This module is the first of two modules which provide a broad introduction to the discipline of psychology. This module will begin with a brief historical and philosophical overview of the roots of psychology and then move on to cover the psychodynamic perspective, behaviourism and learning theory, the biological basis of behaviour, and cognitive psychology. Within the biological perspective the focus will be on motivation and emotion, and within cognitive psychology the focus will be on memory.

ECTS Credits: 6

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Rationale and Purpose of the Module: For students to understand how the field of psychology has approached the topic of personality and for students to develop knowledge of the ways personality and individual difference, intelligence and aptitude are constructed and tested in psychology.

Syllabus: Personality is a collection of emotion, thought and behaviour patterns that are unique to an individual. Through a series of lectures and practical tutorial sessions, topics relevant to the psychology of personality will be explored; including defining personality, temperament, aptitude and difference; personality and intelligence testing; and models including factorial models, typologies and circumplexes.

Prerequisites: PS4032, PS4031

ECTS Credits: 6

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Rationale and Purpose of the Module: To examine how major theories and core areas of psychology can be applied in professional practice

Syllabus: To examine how major theories and core areas of psychology can be applied in professional practice

Prerequisites: PS4042, PS4021

ECTS Credits: 6

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Rationale and Purpose of the Module: This module will introduce students to a range of fundamental theoretical perspectives and issues in general psychology through examining their relevance in everyday life. Through exploring everyday issues students will not only learn about theoretical perspectives but will also gain a basic knowledge of how psychology may be applied.

Syllabus: Through exploring some key studies in psychology, students will gain a basic understanding of the main investigative techniques used by psychologists. The range of topics will include; definitions of psychology; communication and body language; personality; sex and gender; social interaction; emotion; brain and behaviour; health and illness; human development; psychological problems; perception and thinking; learning; humans and animals; applications of psychology

ECTS Credits: 6

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Rationale and Purpose of the Module: This module introduces students to the traditional experimental approach and familiarises them with concepts such as randomisation, experimenter bias, confounding variables via a series of practicals. Issues such as correlation and causation are discussed and the necessity of quasi experimental approaches highlighted. Students learn to design, conduct, code and analyse experimental data whilst paying due consideration to the

Prerequisites: PS4042, PS4021

ECTS Credits: 6

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Rationale and Purpose of the Module: To introduce students to a range of laboratory based activities in psychology and to develop students' ability to work with quantitative data and SPSS in particular

Syllabus: This practical class introduces the range of methods employed in psychology to students. The value of experiments, observational, survey and interviews and case studies work are considered using illustrative examples. Practical skills in these methods are developed though the use of selected examples. Students are also introduced to important IT skills such as library search skills and SPSS for coding of data via practical work.

ECTS Credits: 6

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Rationale and Purpose of the Module: To introduce students to the range of research methods employed in psychology and to develop students' ability to design, collect, code and analyse empirical data using experimental methodologies.

Syllabus: Classical approaches to psychology emphasise the importance of the experimental paradigm to understanding behaviour and mental processes. This lab based module introduces students to the traditional experimental approach and familiarises them with

ECTS Credits: 6

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Psychology

Rationale and Purpose of the Module: The purpose of this module is to introduce students to the rapidly developing field of health psychology, to highlight the importance of a biopsychosocial approach to understanding health and illness, and to improve students understanding of the role that behaviour plays in determining health and illness.

Syllabus: Health Psychology is a sub-discipline of relatively recent origin in psychology, but is rapidly developing a unique identity. Whilst having some concerns in common with clinical psychology, health psychology is concerned with both mental and physical health and in particular their inter-relationship - it is quite distinct from that discipline. Its range of interest is wide and continues to develop, but the discipline by its nature is interdisciplinary, requiring the study of variables at the biological, psychological and social levels. It is an area that is often controversial, reflecting in part, the methodological and conceptual problems inherent in a subject straddling several disciplines. Topics covered include Models of health behaviour, stress, psychoneuroimmunology.

Prerequisites: PS4042, PS4041

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PS4045 - ADVANCED RESEARCH METHODS

ECTS Credits: 6

Psychology

Rationale and Purpose of the Module: Extend students knowledge of the academic discipline of psychology through extending range of design and analysis skills and examining the fundamental assumptions of psychological research and practice.

Syllabus: Advanced statistical techniques for survey and experimental research such as regression, multivariate ANOVA and categorical data analysis. Qualitative methods and in particular key concepts from critical psychological perspective.

Prerequisites: PS4033, PS4042, PS4041

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PS4138 - HEALTH PSYCHOLOGY

ECTS Credits: 6

Psychology

Rationale and Purpose of the Module: to introduce students to the rapidly developing field of health psychology, to highlight the importance of a biopsychosocial approach to understanding health and illness, and to improve students understanding of the role that behaviour plays in determining health and illness.

Syllabus: Health Psychology is a sub-discipline of relatively recent origin in psychology, but is rapidly developing a unique identity. Whilst having some concerns in common with clinical psychology, health psychology is concerned with both mental and physical health and in particular their inter-relationship - it is quite distinct from that discipline. Its range of interest is wide and continues to develop, but the discipline by its nature is interdisciplinary, requiring the study of variables at the biological, psychological and social levels. It is an area that is often controversial, reflecting in part, the methodological and conceptual problems inherent in a subject straddling several disciplines. Topics covered include Models of health behaviour, stress, psychoneuroimmunology.

Prerequisites: PS4042, PS4041

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PS4901 - EMPIRICAL PSYCHOLOGY

ECTS Credits: 6

Psychology

Rationale and Purpose of the Module: The purpose of this research methods module is to familiarise students with a range of laboratory-based activities and psychometric testing in psychology and to develop students ability to design, collect, code and analyse empirical data using experimental methodologies and psychometrics testing. This module is designed to give students and in-depth understanding of the rationale of the procedures, to develop students critical reflection on these procedures and to develop students independent research skills.

Syllabus: This module primarily covers experimental research methods and psychological testing methodologies to assess behaviour, mental processes and personality characteristics. The laboratory part of the module introduces students to basic experimental procedures and their underlying concepts e.g. randomisation, experimenter bias, confounding variables, quasi-experiment. The module also covers the rationale of scale constructions and test constructions to assess individual differences. Students learn to design, conduct, code and analyse experimental psychometric test data whilst paying due consideration to the welfare of participants and attending to the appropriate ethical guidelines. Students will demonstrate independent research skills in two research projects based on the procedures that are taught. The tutorials are designed to critically reflect on the purpose and rationale of the research methods.

Prerequisites: PS4033, PS4042, PS4041

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PS6051 - ADVANCED ANALYSIS IN PSYCHOLOGY 1

ECTS Credits: 6

Psychology

Rationale and Purpose of the Module: Psychology makes use of many different advanced statistical methods. This module is the first of a two-part module sequence on advanced methods of analysis in psychology. The goals of this module are to teach students the principles of advanced statistical techniques and the proper uses of these techniques to test research hypotheses. This module will empower students by instilling them with confidence that they can independently use these data analytic techniques.

Syllabus: Researchers in psychology need to decide which statistical method is most appropriate to a given research question or a particular data set. In order to make these decisions, researchers must understand the basic principles that underlie statistical analyses and have the skills to weigh the advantages and disadvantages of one technique over another. Two modules will examine the
underlying principles, strengths and limitations of a range of statistical methods. The modules provide intensive instruction in the use of statistical analyses commonly used in psychology. The statistical techniques taught in this module, the first of a two-part module sequence, include multiple regression, canonical correlation, analysis of covariance, multivariate analysis of variance and covariance, repeated measures analysis, profile analysis, and logistic regression. Besides understanding the principles, benefits and limitations of these statistical methods, students will also learn how to use these methods with computer software.

PS6061 - PROFESSIONAL SKILLS IN PSYCHOLOGY 1
ECTS Credits: 6

Psychology

Rationale and Purpose of the Module: The aim for this module is to improve students writing skills.

Syllabus: This course is the second part of a two-course sequence on professional skills. In order to successfully communicate research, students need to train their writing skills. In this module, students want to improve students writing skills by means of giving good examples for writing styles and by giving students feedback on their writing skills. Consistent with the purpose of the module, it is intensive in writing.

PS6071 - SOCIAL INFLUENCE AND ATTITUDE CHANGE
ECTS Credits: 6

Psychology

Rationale and Purpose of the Module: The aim of this module is to give an overview to social influence and attitude change processes. An emphasis is given to the applicability of social influence and attitude change strategies to specific social contexts (e.g., advertisement, work environment, interpersonal, and inter-group relationships).

Syllabus: Social influence and attitude change are two core issues in psychology. Human interactions involve different forms of social influence and changes in attitudes. In this module we will examine basic cognitive and affective levels as well as the more social levels (e.g., groups) which determine social influence and attitude change. We will review important, representative contributions to social influence and attitude change. We will provide a historical perspective on the development of theories and paradigms in these areas of research. In addition, we will discuss with students whether and how the prominent theories on social influence and attitude change can be applied to everyday life situations.

PS6091 - CLINICAL MODELS OF PSYCHOLOGICAL DISORDERS
ECTS Credits: 6

Psychology

Rationale and Purpose of the Module: Clinical psychology is the study of psychological disorders and distress. The aim of this module is to give an understanding of psychological disorders and distress, and how their occurrence and persistence can be explained with prominent clinical models of disorders.

Syllabus: The module will provide a valuable introduction to key issues and concepts in clinical psychology. Students will be introduced to prominent psychological disorders (e.g., anxieties, dissociative and somatoform disorders, mood disorders, schizophrenia, personality disorders). The module will also focus on historical and recent approaches that explain the development and the persistence of these disorders. These perspectives will include, for example, psychodynamic, behavioural, cognitive, and systemic approaches. The validity of these clinical models will be discussed by considering up-to-date research in clinical psychology. The lecture series will provide overviews to the topics and the tutorials will allow for in-depth discussions of clinical models of psychological disorders in class.

PS6101 - PERSONALITY AND INDIVIDUAL DIFFERENCES
ECTS Credits: 6

Psychology

Rationale and Purpose of the Module: For students to understand how the field of psychology has approached the topic of personality and for students to develop knowledge of the ways personality and individual difference, intelligence and aptitude are constructed and tested in psychology.

Syllabus: Personality is a collection of emotion, thought and behaviour patterns that are unique to an individual. Through a series of lectures and practical tutorial sessions, topics relevant to the psychology of personality will be explored; including defining personality, temperament, aptitude and difference; personality and intelligence testing; and models including factorial models, typologies and circumplexes.

PS6111 - BIOLOGICAL PSYCHOLOGY
ECTS Credits: 6

Psychology

Rationale and Purpose of the Module: Students will learn about the role of the brain and the central nervous system in human behaviour.

Syllabus: Structure and function of the mammalian nervous system with reference to the biological bases of major classes of behaviour, including neuroanatomy and neurophysiology, role of neurotransmitters in brain function, CNS and endocrine influences on behaviour, localisation of brain function, the importance and limitations the of case study approach and animal research.

PT4005 - SUPPLY CHAIN DESIGN
ECTS Credits: 6

School of Engineering


Rationale and Purpose of the Module: This module is part of a stream. The centrality of planning activity is established in the context of the Supply-Chain Operations Reference Model (SCOR).

Planning incorporates anticipation represented here by Forecasting and making optimal decisions about capacity of supply, storage, production, delivery and enabling processes, and about how to integrate and deploy this capacity optimally in terms of performance and cost trade-offs within the confines of limited resources.

Syllabus: Demand and Order Management: Role of demand management in supply chain planning, Forecasting, Fundamentals of sales and operational planning.
Capacity Planning and Utilization: Role of capacity planning, Capacity planning techniques, Scheduling capacity and materials.
Production and Inventory Management: Master Production Scheduling (MPS) techniques, Bill of material structuring for MPS, Production Activity Control (PAC), Inventory management concepts, Inventory related costs, Multi-item management.
Distribution Requirements Planning: Distribution Requirements Planning (DRP) in the supply chain, Available to Promise, Allocated Available to Promise. Planning in Source, Deliver and Product Returns: Source requirements, Deliver requirements, Product return requirements, Reverse logistics.

PT4011 - INTRODUCTION TO TECHNOLOGY MANAGEMENT
ECTS Credits: 6

School of Engineering

Rationale and Purpose of the Module: The purpose of this module is to introduce students to the concept of Technology Management and in doing so to provide them with an understanding of what they will be studying during their 4-year degree and why it is relevant. This module will provide students with a framework for understanding technology management activities and tools. The module will examine how firms acquire, exploit and protect technology resources. Students will be introduced to a set of tools that can be used in managing technology. Many of the concepts introduced in this module will be explored in greater detail in future modules.


PT4013 - OPERATIONS MODELLING
ECTS Credits: 6

School of Engineering

Rationale and Purpose of the Module: Understand the role of operations in both production and service enterprises. Introduce Lean thinking and structured operations improvement tools.
Introduce a range of quantitative methods and highlight their application in the decision making process for solving real world problems.
Provide an understanding of optimal decisions under constraints.
Provide an understanding of design and analysis of operations under uncertainty.
To provide students with modeling and software capabilities that can be applied to operations design and analysis.

Syllabus: Lean Thinking and Operations Introduce students to lean thinking and operations improvement tools used within DMAIC (Define-Measure-Analyze-Improve-Control) projects. Related lean thinking to operations modeling methods. Operations Modeling - Software: Introduce and provide students with base skills to use software to solve operations optimization models. The focus is primary on introducing the student to spreadsheet modeling, but brief introductions to other modeling and optimization software will be given. Students will apply software modeling skills obtained here to subsequent topics. Operations Modeling Under Constraints Basic definition of Linear programming, demonstrate method via graphical method, model formulation applications in operations. Simplex method, Artificial starting solution method, interpretation of simplex tableau, sensitivity analysis. Transport model, Assignment model, Shortest Route model, Network Minimisation model, Maximum Flow Model, Transshipment model. Introduce binary and integer applications in operations analysis, integer solution methods such as branch-and-bound and meta heuristics solution methods. Decision Making Under Uncertainty. Introduce decision making under uncertainty. Introduce basics of simulation using spreadsheets. Introduce basic queuing and inventory models.

PT4015 - LEAN THINKING AND LEAN TOOLS
ECTS Credits: 6

School of Engineering

Rationale and Purpose of the Module: To introduce the main elements of the Lean process improvement

PT4025 - SIMULATION MODELLING AND ANALYSIS
ECTS Credits: 6

School of Engineering

Rationale and Purpose of the Module: To provide students with knowledge on discrete event simulation modelling and its application to manufacturing, logistic and services systems. To provide students with modelling and software capabilities to apply simulation to manufacturing, logistic and services systems

Syllabus: Introduction to simulation Overview of simulation modelling, introduction to the basic concepts of discrete event simulation. The simulation process steps involved in carrying out a simulation project. Comparison of discrete event simulation with continuous simulation and system dynamics. Computer simulation packages Overview of available computer packages, description of representative packages, computer implementation issues. Development of programming skills to apply simulation to manufacturing, logistic and services systems using a generic simulation package. Provide an overview of available simulation software. Statistical aspects of simulation Input analysis, random number generation, output analysis, experimental design. Queuing Models Provide comparison of simulation with stochastic mathematical models through the introduction of basic queuing models. Systems Design Using simulation students will carry out systems (manufacturing, logistic and services systems) design assignments.

PT4027 - INNOVATION AND TECHNOLOGY MANAGEMENT
ECTS Credits: 6

School of Engineering

Rationale and Purpose of the Module: To provide students with an understanding of the role of technology and innovation within industrial organisations and with the ability to manage technology as a resource within projects, services and processes.

Syllabus: Business opportunities and strategies, product and technology strategies, planning, support and finance for technology based businesses, product lifecycles costs, cost estimating. Innovation Management, types of innovation, the innovation process, successful innovation and innovators, creating the innovative organisation, new technology-based firms. Markets for new products and technologies, identifying and interpreting customer needs, translating customer needs into product specifications. New product and service ideas, forecasting techniques, technology trajectories, product concept generation, selection and testing, product planning, product platforms, product specifications. Sources of technology, technology transfer, strategic alliances, the management of patents and intellectual property, Research & Development management, Success Factors, Product Development Process, the use of Prototypes, Product Development Organisation, product commercialisation and launch. Managing technical projects, project definition, planning and execution.

PT4031 - SUPPLY CHAIN MANAGEMENT STRUCTURES
ECTS Credits: 6

School of Engineering

Rationale and Purpose of the Module: This module is designed to provide a strategic understanding of the supply chain, enabling students to appreciate the supply chain phenomenon. This module:
- Defines supply chain management theoretical and practically.
- Identifies supply chain management’s role in enhancing customer fulfillment.
- Emphasises systems thinking and process management as the foundation of supply chain management.
- Examines the role of environmental scanning to define the forces driving greater collaboration.
- Discusses the critical issues involved in supply chain design.
- Discusses the vital bridges to supply chain integration and collaboration.


PT4047 - MEASUREMENT AND QUALITY SYSTEMS
ECTS Credits: 6

School of Engineering

Rationale and Purpose of the Module: Appreciate the importance of measurement standards and systems. Apply sound principles to a variety of measurement requirements. Understand and apply scientific principles to the analysis
of manufacturing data. Use the results of the analysis to identify areas that need improvement.


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**PT4057 - ADVANCED MODELS AND FRAMEWORKS FOR SUPPLY CHAIN MANAGEMENT**

**ECTS Credits:** 6

**School of Engineering**

**Rationale and Purpose of the Module:** To introduce students to a range of frameworks to inform systematic thinking on the alignment, design, implementation and operation supply chains to promote their agility, adaptability and growth. To support the lean pursuit of key strategic performance dimensions delivery, quality, and economy in the context of a dynamic, uncertain and competitive operating environment. To consider frameworks appropriate at micro, meso and macro levels of operation. To promote a quantitative approach to supply chain operations analysis. To include a strong human context in addressing diagnosis and design questions.


**Sourcing**

Sub-contracting of production and logistics, outsourcing, off-shoring, in-sourcing, globalisation.

**Product control**

New product and service development activities (e.g. Urban-Hauser; Stage-Gate, spiral models), product life-cycle., underpinning concepts such as continuous/radical/ disruptive innovation, customer experience, sustainability. Analysis tools eg customer-choice analysis, quality function deployment. Product validation.

**Quantity control**

Micro: process mapping, inventory, job sequencing, push/pull order release, model of human scheduling, queuing, lilltes law, flow factor. Meso: forecasting, aggregate planning, routing and network planning, production-inventory system dynamics. Macro: capacity decisions, location.

**Quality control**

Micro: controllable/uncontrollable variation, sampling for variables and attributes, control charts. Meso: specification capture (QFD), fitness for purpose, reliability and risk analysis, fitness for society. Macro: strategy deployment (Hoshin), quality frameworks ISO, Baldridge, EFQM.

**Production economy**

Cost of doing: cost estimation, asset investment cost, capital recovery, activity based costing, unit costing, rate of return on investment, intangibles. Cost of not doing: Feigenbaum quality cost model.

**Information Systems**

Hierarchical planning and control systems. GRAI grid and levels of decision and analysis. Enterprise Resource Planning. Operations reference models, ARIS and enterprise integration views. Interoperability at technical and organisational levels.

**Human factors**


**Process Improvement**

Continuous improvement philosophy, commonalities of Lean and 6-Sigma, PDSA, forms of waste, problem seeking, focusing tools, design of experiments, engagement with people, implementation and control, kaizen, DMAIC framework. Capturing the soft side: Qualitative analysis and mixed methods. Project planning and control, specific project methodologies eg PERA. SCOR implementation framework (SCE).

Semester project work

Reflection on SCOR model and its relation with the framework above. Application in depth of a focused set drawing on the frameworks listed above to solving or analysing specific supply-chain questions in a substantial semester project. The work is to be collaborative, and carried out in project teams using computer mediated communications. The results are to be presented in written and verbal form. Qualitative enquiry should inform the project development path, but the work should be primarily related to quality- and quantity-control processes.

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**PT4111 - MANUFACTURING TECHNOLOGY 1**

**ECTS Credits:** 6

**School of Engineering**

**Rationale and Purpose of the Module:** To provide the student with a basic knowledge and experience the properties of engineering materials are how they are processed and fabricated. To emphasise the importance of safety in the engineering environment. To provide the student with the knowledge to select an appropriate material for the manufacture of an engineering component or structure.

**Syllabus:** Safety in the Laboratory. Production of materials - metals and plastics. Properties of materials yield and tensile strength. Fracture and toughness. Factors influencing the selection and processing of materials.
Measuring instruments.
Basic machining Cutting tool geometry and materials.
Chip formation. Hand processing and surface treatment of materials.
Metal Forming - Cold, warm and hot metal forming techniques.

PT4121 - COMMUNICATION GRAPHICS
ECTS Credits: 6

School of Engineering
Rationale and Purpose of the Module: This module provides an introduction to the fundamentals of the universal language of engineering, design and technology. The essential conventions, principles and concepts of the graphic language are explored through visualising and solving problems using a combination of freehand sketching and manual drawing communication techniques. The visualisation and graphic skills developed are essential prerequisites for 2D and 3D CAD.

To promote and nurture spatial-visualisation and spatial-reasoning abilities critical to the success of technology professionals.
To present the standards and conventions of engineering drawing essential to the correct creation and interpretation of graphical representation used in engineering communication and documentation.
To foster manual drawing skills, especially sketching, which are essential to design and communication success.


PT4317 - PRODUCTIVITY METHODS 4
ECTS Credits: 6

School of Engineering
Rationale and Purpose of the Module: To develop students formal planning capability in optimisation domain within context of production planning and resource utilisation and performance.

Syllabus: LP is vehicle for optimisation (Taha), proceeding to stochastic simulation (Simul8 demo) and heuristic based line balancing, and dual-objective stochastic tradeoffs demonstrated by simple variability-utilisation-time queuing models (Hopp and Spearman). Mathematical level appropriate to BSc. Breadth appropriate to underpin scientific process improvement practice.

Prerequisites: PT4317

PT4423 - 2D CAD
ECTS Credits: 6

School of Engineering
Rationale and Purpose of the Module: 2D CAD drawings are vital to the communication of engineering design information. 2D CAD generated drawings are used in such diverse areas as architectural design, mechanical part design, facilities layout, service and circuit diagrams and technical publications. This module introduces students to the concepts, principles and techniques of 2D CAD drawing and design using AutoCAD. The adoption of best practice strategies for the efficient and effective use of CAD for creating, editing and viewing geometry as part of the design process are stressed throughout the module.

Syllabus: Contemporary CAD software with particular reference to AutoCAD; hardware, software and operating systems; the AutoCAD drawing environment: absolute and relative coordinates, units and limits; CAD tools and drawing setup; drawing templates; the UCS; basic and advanced drawing and editing commands; introduction to layers; creating and using blocks Wblocks, attributes and symbol libraries; communicating engineering and design details; dimensioning and dimensioning styles; text styles; tolerated dimensioning: sectional views and hatching; tool palettes; Paper Space layouts; customisation techniques; customising toolbars and toolbar macros; isometric drawing. CAD construction techniques; plotting; sheet sets; raster images, multilines; using DesignCenter; DWF drawings; Introduction to 3D geometry.

Prerequisites: PT4121

PT4427 - DESIGN FOR MANUFACTURE
ECTS Credits: 6

School of Engineering
Rationale and Purpose of the Module: To introduce the student to the science and art of New Product Development. It links the manufacturing and construction skills learnt in earlier modules with the design
process and these are brought together by means of a project. The project is intended to take the student through the basic design process into requirements engineering, market analysis, materials, manufacturing processes and the production of an initial business plan.

**Syllabus:** Problem definition and clarification - design briefs; New Product Development (NPD) Concurrent Engineering NPD vs Traditional NPD; The deliverables of processes of design; NPD Failure Reasons, Rationale for Concurrent Engineering.


Concept Evaluation - Ranking Methods, Concept Assessment Techniques, AHP. -Pugh Concept Selector, Convergence and Divergence.


Design for Assembly (DFA).


Intellectual Property - Patents, Application Process and requirements.

Copyright, trademarks and design registration.

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**PT4617 - RELIABILITY TECHNOLOGY**

**ECTS Credits:** 6

**School of Engineering**

**Rationale and Purpose of the Module:** To give students an understanding of the principles of reliability evaluation and the influence on maintenance strategies, costs and replacement decisions. To equip students with abilities to perform environmental audits on products and processes. To present environmental impact assessment and ecological foot-printing of products and processes used in the critical realisation of current unsustainable engineering trends.


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**PY4071 - PEDAGOGY OF OUTDOOR AND ADVENTURE EDUCATION**

**ECTS Credits:** 6

**Physical Education & Sport Sciences**

**Rationale and Purpose of the Module:** National documents (Teaching Council 2011) call for preservice teachers to, among other things: &bull; have knowledge of current national curricula/syllabi in the relevant sector and an awareness of curriculum requirements in preceding and subsequent stages of learning; &bull; understand the subject matter, pedagogical content and related methodology of the relevant curricula/syllabi and guidelines, and &bull; be able to think critically, analyse and solve problems, as an individual and a member of a team.

The concepts and skills associated with outdoor and adventure uniquely address each of these skill sets. As such, this module is designed to prepare preservice teachers to organise, teach, and facilitate outdoor and adventure education in Irish physical education.

**Specific purposes are to:**

1) enhance students’ capabilities teaching outdoor and adventure to post primary students; 2) draw links between the current national curricula/syllabi regarding outdoor education and selected curricular and instructional models; 3) recognize the potential of non-sport related activity in the lives of post primary students; and 4) gain understanding of the conduct of off-site teaching.

**Syllabus:** Through the acquisition of adventure and outdoor skills and knowledge, the pedagogy in teaching outdoor and adventure education and selected curricular models will be examined. Adventure principles include full value of experience, experiential learning cycle, challenge by choice, briefing, processing and facilitating an experience, the determination of physical and emotional risk, and safety. Outdoor activities may include: orienteering, hill walking, camp craft, exploring nature, leave no trace, canoeing, rock climbing. Pedagogical skills involve big picture goals and assessment, aligned learning outcomes, content progression, and assessment, focused reflection on student learning linked to teacher action.

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**PY4081 - PEDAGOGY OF INVASION GAMES**

**ECTS Credits:** 6

**Physical Education & Sport Sciences**

**Rationale and Purpose of the Module:** The rationale of this module is to allow students to become familiar with a selection of invasion games, ones in which skills and tactics can easily be identified and practiced, and where minimal equipment is required. The purpose of the module is twofold: 1.) for students to be able to understand the tactical approaches, appropriate skills, and safety considerations necessary when engaging in invasion games and 2.) to provide students with the pedagogy skills needed to teach invasion games within a post-primary setting. The module will be taught through
particular curriculum model, for example TGFU. The students will live the curriculum model in order to understand the structure of the model and how it can be taught within a post primary setting.

The module will focus on principles of play and tactics within invasion games. Therefore links will be made across all invasion games so students can see the correlation and common tactics involved in each.

**Syllabus:** The purpose of this module is for students to become familiar with simple invasion games and, in particular, how these games are presented in the Junior Cycle, junior cycle short course, Senior Cycle, and Leaving Certificate physical education curricula. Students will experience and analyse many invasion games, for example Gaelic Football, Hurling, Soccer, Hockey, Rugby and Basketball, focusing on the following areas: common principles of play, tactical awareness, rules and skill acquisition; how to introduce activities and progressions; and safety considerations specific to all the games. The module will be taught through a curriculum model, for example: TGFU. TGFU will aid the principles of play and tactical focus of the module.

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**PY4122 - GAELIC GAMES**  
**ECTS Credits:** 6

**Physical Education & Sport Sciences**

**Rationale and Purpose of the Module:** This module is designed to give an introduction to Gaelic games from a practical and cultural perspective. It will offer an introduction to the history of the Gaelic Athletic Association (GAA) and the development of the association from its foundations in 1884 through to the present day. The module will also introduce students to Hurling, Camogie and Gaelic Football specifically through participation in 'Gaelic Games related' learning activities as well as practical labs. Emphasis will be placed on developing knowledge and basic competency with respect to the core skills of these games and principles of play (e.g. defending and attacking). Students will become aware of how to provide a safe environment and ensure personal safety as well as that of others in Gaelic Games activities. Understanding the rules and regulations of each game will also be developed through the practical labs. Basic coaching skills will also be introduced.

**Syllabus:** Foundations of the GAA; Development of the GAA (1884-2016); Key strategies, programmes, policies and initiatives (1884-2016) (e.g. Go-games Initiative, Grassroots to National Programme); Gaelic Games Associations (e.g. Gaelic Players Association, Ladies Gaelic Football Association); Gaelic Games Worldwide.

Introduction to the core skills of Hurling, Camogie and Gaelic Football; Common principles of play; Structures, rules and regulations; Skill development, including fundamental movement and basic motor skills; Warm-up and cool-down; Games vs drills; Basic tactics; Introducing activities and progressions including modified and full-sided games; Safety aspects (environmental, personal and player safety); Coaching styles and methods; Planning practical sessions for different ability groups; Developing communication and organisations skills in practical environments; Player and self-evaluation in a practical context.

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**PY4123 - INSTRUCTIONAL ALIGNMENT IN PHYSICAL EDUCATION**  
**ECTS Credits:** 9

**Physical Education & Sport Sciences**

**Rationale and Purpose of the Module:** The rationale of this module is for students to be introduced to instructional alignment in physical education, i.e., when outcomes, activities, instruction and assessment of a physical education programme are matched and compatible. Students will become familiar with and be able to critically comment on the central topics of curriculum, assessment, and teaching and learning, within the (Irish) post-primary physical education context; thus, informing what they believe is worth learning and assessing within physical education. Students will be directed to address these central topics in their preparation of schemes of work and lesson plans for year 2 school placement.

The purpose is threefold:

1) To allow students to become familiar with various ways of looking at curricula which encourage critical monitoring and evaluation of the (Irish) post-primary physical education curriculum.

2) To acquaint pre-service teachers with how learning by individual pupils can be facilitated through the provision of appropriate environmental factors (e.g., safety, facilities, equipment, and teacher information) and the setting of tasks (through instructional and teaching strategies) suitable to individual learners. It will introduce pre-service teachers to ideas on how to design challenging learning experiences for students, select applicable teaching strategies to facilitate student learning, and modify / adapt these to accommodate student learning.

3) To introduce the concepts of assessment of learning and assessment for learning and their potential to document student learning in a physical education environment.

**Syllabus:** This module provides an opportunity to understand instructional, curricular, and assessment concepts related to effective teaching and learning in physical education. Course content will examine various teaching strategies and instructional formats, physical education curricular models, and formative and summative assessment strategies. In addition, the extent to which personal orientations and philosophies impact instruction, curriculum, and assessment will be investigated. Further topics include an understanding the physical education curriculum within the (Irish) school system and what is worth learning. Students will be directed towards aligning their belief systems with the use of particular curriculum/instruction models. Understanding assessment and its relationship to learning goals and learning experiences will allow students to determine what is worth assessing and how this can be done in a meaningful, relevant and effective way. The preparation of schemes of work and lesson plans for year 2 school placement will be a consistent focus of the module.

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**PY4133 - PEDAGOGY OF DANCE AND GYMNASTICS**  
**ECTS Credits:** 6

**Physical Education & Sport Sciences**

**Rationale and Purpose of the Module:** The purpose of this module is to prepare students to teach the fundamentals of Dance and Gymnastics in a post-primary context; to provide safe, inclusive and educationally meaningful experiences for post-primary students in the Dance and Gymnastics. Students will be introduced to Junior cycle requirements for both strands, develop their knowledge and understanding of the key pedagogical principles of both through critically examining the Physical Education curriculum and the frameworks for the relevant Junior Cycle short course. Students will learn about relevant bodily techniques, skill development, aesthetic appreciation, creative composition, using basic gymnastics equipment and the transferability of learning in Dance and Gymnastics across the post primary curriculum. A range of strategies for teaching, learning and assessment in and
through Dance and Gymnastics will be introduced and practiced. The key instructional strategy will focus on but not be limited to the Inquiry Model. To give focus to the module learning outcomes and module content this module will be framed around selected Curriculum Models for example Sport Education. This will help frame the content of the module and by focusing teaching and learning experiences on a more complete and authentic level in these two Physical Education strands students will be provided with a map for decision making about teaching and learning in Dance and Gymnastics.

**Syllabus:** At the centre of this module syllabus will be the introduction to the Junior and Senior Cycle Frameworks for Physical Education and JCPE short courses. Attention will be paid to Wellbeing as well as aesthetic education through meaningful movement experiences along with the Junior Cycle Statements of Learning and Key skills. There will be an introduction the Laban’s Movement Analysis as a tool for developing observation for physical literacy, Curriculum Models, inclusive teaching and learning practices, resources for teaching Dance and Gymnastics, assessment of and for Dance and Gymnastics, lesson planning (warm ups, task based activities, lesson development and closure) and schemes of work design with specific reference to curriculum alignment. Students will be introduced to basic equipment and apparatus and as a consequence also be introduced to safe practice in Gymnastics.

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**PY4135 - ADAPTED PHYSICAL ACTIVITY AND PHYSICAL EDUCATION**

**ECTS Credits:** 3

**Physical Education & Sport Sciences**

**Rationale and Purpose of the Module:** Integration and inclusion of all individuals into school structures and curricular provision is an essential feature of physical education teaching. Catering for individuals with varying levels of ability from limited to a high level requires knowledge of appropriate pedagogical principles and an ability to situate the needs of the individual on a whole school and classroom basis. Empowerment and entitlement are key concepts within this module.

The purpose of this module is threefold:

1) To critically evaluate the attitudes and beliefs about teaching and learning which inform and guide his/her professional practice.

2) To act as an advocate on behalf of learners, referring students for specialised educational support as required and participating in the provision of that support, as appropriate.

3) To identify cross-curricular links and themes including citizenship; creativity; inclusion and diversity; initiative and entrepreneurship; personal, social and health education; and ICT, as appropriate to the sector and stage of education, and how these are related to life experiences.

**Syllabus:** This module is designed to provide students with an introduction to adapted physical activity with a focus on physical and motor characteristics of persons with disabilities as they relate to programming in physical education. The course will focus on past and present research regarding motor/physical development, assessment, and programming for individuals with cognitive, sensory, physical and health impairments. Students will be able to identify and understand how Ireland views the placement of children with disabilities and the efforts it takes to promote more inclusive physical education programmes.

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**PY4145 - QUALITATIVE BIOMECHANICS FOR PHYSICAL EDUCATION**

**ECTS Credits:** 3

**Physical Education & Sport Sciences**

**Rationale and Purpose of the Module:** While a sound knowledge of anatomical structure is a prerequisite for effective analysis of human movement activity, analysis requires good understanding of how forces act on joints and how joint structure affects movement. There is a need for the physical education specialist to develop effective skills qualitatively analysing joint function through a synthesis of knowledge of anatomy and of basic mechanics. There is also a need to encourage the student to focus on the applied nature of anatomy and mechanics in sport and physical education. An emphasis on applied nature of this knowledge to sports performance will be achieved through extensive practice in the application of deterministic models of performance, and examination of overall performance objectives, biomechanical factor and principles and critical features of performance in a wide range of sport and exercise activities. It encourages students to examine qualitatively, the effects of forces on joint function. The module is also a preparation for the more detailed quantitative approaches and presents a structured approach for analysing skills and identifying critical coaching and teaching points.


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**PY4155 - PEDAGOGY OF AQUATICS / ATHLETICS**

**ECTS Credits:** 6

**Physical Education & Sport Sciences**

**Rationale and Purpose of the Module:** This module introduces students to two strands that are focused on individual performance; Aquatics and Athletics. Students will learn how to plan both Aquatics and Athletics lessons which are safe, enjoyable, inclusive and educationally meaningful. Furthermore, established links will be made between the two respective activities and bio-mechanics particularly in the context of contemporary Irish Physical Education. Both strands provides opportunities “for the personal, physical, and social development of each student in a safe, enjoyable environment” (JCPE, 2003; 19). It will be emphasized how important adaptions and modifications are within in a physical education class, whether it be “modified forms of standard events” or “combinations/adaptations” or recognized strokes. The module will be taught through particular curriculum model, for example HRA. The students will live the curriculum model in order to understand the structure of the model and how it can be taught within a post primary setting.

**Syllabus:** Aquatics: the focus will be on learning the fundamentals of swimming; buoyancy, propulsion and streamlining. Being aware of the effects of being in water on balance, propulsion and resistance will be introduced. Observe ing the buoyancy and weightless quality: How individuals and various depths in the pool will also be observed. Understanding and demonstrating the importance of safe
water entries will be emphasized. Performance and analysis of various strokes/modifications of strokes, e.g. front crawl, back crawl and breast stroke will be taught. Understanding the benefits of and participating in exercise in the water will be taught to the students. Demonstrating the ability to perform various water safety skills and survival skills will be an important skill for the students to learn. A brief introduction to water polo will be introduced. Athletics: An overview of athletics from a variety of perspectives (bio-mechanical, physiological, educational) will be given to the students. Athletics within post primary schools will be explored; limitations and possibilities, athletics lessons, planning for mixed ability and the logistics of running a school athletics event. The fundamentals of running, jumping and throwing will be emphasized, progressing to basic, event specific technique in traditional track & field athletics events (e.g. sprints, hurdles, Long Jump, High Jump, Shot, Discus etc.). Students will be involved in 'athletics related activities' (indoors & out). There will be a focus on the teaching of athletics within a post primary school setting.

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**PY5021 - EVIDENCE BASED PRACTICE**

**ECTS Credits:** 12

**Clinical Therapies**

**Rationale and Purpose of the Module:** This proposed module is a distance eLearning format of PY5021 which will permit students to opt either to complete a module on evidence based practice via lectures and tutorials on campus in semester 2 of the academic year, or by eLearning in Semester 1. Module PY5021 Evidence based practice is a mandatory requirement for the post graduate certificate offered by the Department of Clinical Therapies. The module equips students with the skills and knowledge to adopt evidence based practice (EBP). High quality service provision requires that the most current relevant research is combined with experiential learning and service users preferences. This module will enable students to source and critically appraise the research, reflect on their practice and synthesise this knowledge to address service requirements. The students will also gain an understanding of the barriers and facilitators in implementing EBP in the workplace.

**Syllabus:** Introductory day on campus to ensure students are able to access and use electronic resources. Series of keynote topics delivered on-line and supported by a discussion forum, group work and tutorials on the different facets of EBP; defining a service question, searching for and appraising the most current literature, integration and synthesis of information to address service needs and the implementation in practice. Evaluation of changes in work practices.

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**SN4201 - SOCIAL SCIENCES 1, INTRODUCTION TO PSYCHOLOGY**

**ECTS Credits:** 6

**Nursing & Midwifery**

**Rationale and Purpose of the Module:** The aim of this module is to provide the students with an understanding of psychological concepts and explore how these concepts relate to health within nursing and midwifery practice.

**Syllabus:** Overview of emotional, cognitive, and social development. Development of intelligence. Psychology of health beliefs, experience, and behaviour. Social psychology: in particular, the concepts of attitude development, interpersonal and group relationships, and communication. Introduction to the main categories of abnormal behaviour, including their aetiology and treatment.

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**RM4001 - RESEARCH METHODS IN LANGUAGES, LITERATURE AND CULTURAL STUDIES 1**

**ECTS Credits:** 6

**School of Culture and Communication**

**Rationale and Purpose of the Module:** This module introduces students to research methods in languages, literature and cultural studies, covering the main areas of these disciplines, their methods of inquiry, and their key concepts and problems. The module provides training in essential research skills, equipping participants to pursue self-directed study, to individually select a research topic and develop appropriate research questions, to identify the appropriate tools and methods of research to carry out this project, and write a research proposal. The aims of the module are:

- To introduce students to research methods in languages, literature and cultural studies;
- To equip students with the necessary skills to select a research topic, develop a research question(s) and write a research proposal;
- To introduce students to the research skills required for sourcing, storing and presenting research data;
- To develop an awareness of the information technology skills necessary to develop the above research skills.

**Syllabus:** Intended as an introductory course for students undertaking research in languages, literature and cultural studies, students will be introduced to the quantitative and qualitative methods employed in each of these disciplines. Incorporating a practice-based element, students will be equipped with the necessary skills to select a research topic, develop a research question, identify the appropriate methods to carry out this research project, and write a research proposal. Students will also be introduced to the skills needed to source and present language, literary and cultural data, in particular the information technology skills necessary for analysing online data such as collections of literary texts and linguistic corpora.

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**SO4001 - INTRODUCTION TO SOCIOLOGY**

**ECTS Credits:** 6

**Sociology**

**Rationale and Purpose of the Module:** This module aims to introduce students to the subject matter of contemporary sociology. It will familiarise students with the key concepts used within sociological analysis and demonstrate, using illustrative materials, the uses and importance of sociological analysis in the modern and post-modern world.

**Syllabus:** An introduction to the sociological perspective

*What is sociology and what do sociologists do?*

*The development of sociology*

*The sociological imagination*

*An introduction to sociological theory*

*Agency and Structure*

*Culture, Norms and Values*

*An introduction to structural functionalist theories*

*An introduction to conflict theories*

*An introduction to interaction theories*

*An introduction to feminist theory and post-modernism*

*An introduction to sociological research*

*The ethics of social research*
**SO4033 - SOCIOLOGY OF MEDIA**
ECTS Credits: 6

**Sociology**

Rationale and Purpose of the Module: This course aims to provide students with a critical understanding of the mass media from a sociological viewpoint. It will introduce students to key aspects of the debate amongst social scientists about the workings and influence of the media. The course is structured upon an examination of these key areas as well as presenting examples of the various methodological approaches used by sociologists in their analysis of the mass media.

**Syllabus:**
- Sociology and the analysis of mass media.
- The production/content/reception model of media analysis.
- Applying sociological theories and methods in critically understanding the mass media.
- Media globalization.
- Globalization, eQ-localization/E and Media Audiences.
- Media Ownership, concentration and conglomeraton.
- The political economy perspective. The public sphere.
- Media production and media professionals.
- Structure and agency in a media setting.
- Hall’s encoding/decoding model.
- Ideology, dominant ideology and discourse.
- Analysing media content: media re-presentations in a divided world.
- Media representations of class, ethnicity, gender and sexuality.
- Media audiences. Qualitative approaches towards understanding media audiences.
- Audiences as fans.
- Diasporic audiences.

**SO4037 - QUALITATIVE METHODS FOR SOCIOLOGICAL RESEARCH**
ECTS Credits: 6

**Sociology**

Rationale and Purpose of the Module: The aim of the module is to provide students with an understanding of the welfare state. Students will be familiarised with debates, definitions and theoretical frameworks pertaining to the concept of the welfare state, the different models of welfare in existence, and the need for a rigorous analysis of the welfare state. In addition to enhancing students awareness and understanding of key sociological theories, concepts, and issues, this module is oriented to developing students ability to use sociology as an analytical tool. It is hoped that students will consider the issues covered in the module as case studies through which they can develop their understanding of the techniques of sociological analysis, which may then be applied to other contexts.

**Syllabus:**
This module aims to provide students with an understanding of the welfare state. Students will be familiarised with debates, definitions and theoretical frameworks pertaining to the concept of the welfare state, the different models of welfare in existence, and the need for a rigorous analysis of the welfare state. The module examines the development of welfare provision and the different models of welfare provision and the different models of welfare throughout Europe & in the USA. Specifically the module will focus on the Irish context as it seeks to examine the structural, cultural and ideological dynamics underpinning the Irish model of welfare provision. We will engage with current and established sociological theories and debates as a means of interpreting and understanding the implications of these issues have for the distribution of power, the concept of and the operation of citizenship, processes of social exclusion, the role of social policy, and public discourse.

**SO4047 - SOCIOLOGY OF THE WELFARE STATE**
ECTS Credits: 6

**Sociology**

Rationale and Purpose of the Module: The aim of this course is to introduce students to the important sub-disciplinary field of the sociology of health and illness.

The overall objective is to develop the students analytical ability to examine the concepts of health and illness from a sociological perspective (perspectives), and critique the structures and processes involved in these within late modern Western society.

**Syllabus:**
- THEME I: NEW SOCIO-CULTURAL DIMENSIONS
  The sociology of the body/embodiment
  The sociology of risk

- THEME II: SCIENCE, TECHNOLOGY & MEDICINE
  Theorising the relationship between science, technology and medicine.
  Human Genetics and the redefinition of disease
  Reproductive genetics, predictive testing and the construction of risk
  New reproductive technologies: assisted reproduction and infertility

- THEME III: SOCIAL PERSPECTIVES ON MENTAL HEALTH & ILLNESS
  The social construction of mental illness
  Social models of mental health & illness
  Therapeutic and social meanings of the recovery concept

- THEME IV: THE MEANINGS AND EXPERIENCES OF HEALTH, ILLNESS & DEATH
  The social construction of health, illness & disease
  The experience of chronic illness
  Illness related stigma
  Death and dying

- THEME V: SOCIAL STRUCTURE AND HEALTH
  Social Class and health
  Gender and health
  Ethnicity and health

- THEME VI: MEDICINE, POWER AND AUTONOMY
  The professional dominance of medicine in healthcare
  Inter-professional relationships: power, knowledge and jurisdiction.
SO4063 - INTRODUCTION TO SOCIAL RESEARCH METHODS
ECTS Credits: 6

Sociology

Rationale and Purpose of the Module: The aim of this module is primarily to provide a general introduction to the range of quantitative and qualitative research methods which are used in sociological research. Secondly, the course introduces students to the underlying epistemological, conceptual and ethical dimensions of the research process. In addition, the course establishes the importance of understanding social research in the context of some key debates in contemporary sociology. The primary objective is to provide students with basic skills in the use of both quantitative and qualitative techniques of research, and experience in collecting, handling, organising and analysing data of their choice.

Syllabus: This module enables students to gain an understanding of the principles of social research and related philosophical debates from a generic social science perspective. The module addresses the ethical and legal dimensions of, and power relationships within, the research process. Students learn to appreciate the variety of methodological techniques, how to judge which are appropriate to particular research problems and how to identify the merits and limitations of different types of research design, including issues of sampling, sampling error, objectivity, values and validity. They are introduced to basic statistics, SPSS, and Qualitative Techniques in Context and thus provided with a foundation for future advanced methods modules. This module covers: conceptualisation and operationalisation in research design; an introduction to qualitative techniques; analysing qualitative data; surveys and sampling; descriptive statistics and inferential statistics (SPSS); political and ethical issues in social research; presenting and dissemination research: experimental and documentary methods in social research.

SO4073 - CLASSIC SOCIOLOGICAL THEORY
ECTS Credits: 6

Sociology

Rationale and Purpose of the Module: This module introduces students to classic social theory. Key work is reviewed, incorporating various perspectives from classic thinkers who continue to have an enduring influence on the sociological imagination. The module will consider some of the major works of: Marx, Durkheim, Weber, Simmel, Schutz and Mead.

Syllabus: The module begins by outlining the socio-historical transformations (industrialisation, urbanisation, expansion of capitalism) that gave rise to classic social theory. Key thinkers, who sought to make sense of modernity and the problem of social reality, are then discussed; such as: Mark, Durkheim, Weber, Simmel, Mead and Schutz. Discussion will focus on their different analyses of, among other things: the development of capitalism and the money economy; the division of labour; social solidarity; class conflict and ideology; rationalisation; religious life; the structures of the life-world; the dynamics of symbolic interactions and the self. The module considers analyses of historically unfolding macro-social structures, meso-social formations (e.g. bureaucratic organisation) and the vicissitudes of everyday life. The import of classic social theory to the discipline of sociology - including its aims, scope and analyses of modernity - is a theme that runs through the module.

SO4118 - SOCIOLOGY OF GENDER AND POPULAR CULTURE
ECTS Credits: 6

Sociology

Rationale and Purpose of the Module: a. To provide an opportunity for the student to examine of key theoretical perspectives relevant to the study of gender and popular culture
b. To offer ways of evaluating the work of major sociological schools/theorists in the study of popular culture and gender studies.
c. To develop the ability to analyse and interpret popular cultural texts through the lens of gender analysis.

Syllabus: This module explores the twin themes of bodies and sexualities in the spaces of contemporary Western culture. Utilising a range of popular cultural forms, sites and events which are most accessible - television, cinema, magazines; households, shops and workplaces; and popular understandings of medicine, science and technology - the module involves students in a series of critical engagements. The module addresses a number of issues; why the subjects of sexualities and the body become the focus of so much interest across a broad range of disciplines; How we an de-naturalise and problematise normative gender categories by setting gendered identities in cultural contexts; What important contributions have been made to the field by recent work on masculinities; How the practices of everyday life can be interrogated to yield insights about the relationships between the body, gendered identities and prevailing cultural norms.

SO4067 - SOCIOLOGY OF WORK
ECTS Credits: 6

Sociology

The course will introduce theories of social change and perspectives on work as well as examining contemporary changes in work practice. The effects of class, gender and ethnicity on access to and experience of work will be examined. The changing organizational context of work will be explored. Other themes include sectoral decline, development and relocation as well as an examination of globalization and the rise of the transnational corporation. The continuance of hierarchical and vertical segregation in the midst of organisational, societal and cultural change will be explored, as well as organisational culture. A number of Irish case studies will be examined e.g those related to the semi-state and educational sectors. The course concludes with a consideration of the future direction of socioeconomic change and its impact on the distribution, structuring and experience of work.

SO5051 - RESEARCHING SOCIAL EXCLUSION
ECTS Credits: 9

Sociology

Rationale and Purpose of the Module: The concept of exclusion forms the central focus around which this module is organised, it offers the possibility of considering how finely tuned are the mechanisms whereby we are integrated or cut off from full involvement in the wider society.
Syllabus: The course critically interrogates the concept of social exclusion examining its economic, social, cultural, political and ideological underpinnings. It focuses in particular on the process of aethëring as a practice of domination and the subtle ways in which privilege is reproduced. Through the course students will be enabled to untangle the notion of exclusion, its dynamics, processes involved, the implications of exclusion and the structural, cultural and ideological issues underlying this phenomenon and its reproduction. Through Bourdieu/És conceptual arsenal students will be facilitated to consider the hierarchial ordering of the process of exclusion and the multi-faceted and interlinked nature of domination, privilege and exclusion.

SO6021 - THEORETICAL APPROACHES TO GENDER, CULTURE AND SOCIETY 1
ECTS Credits: 9

Sociology

Rationale and Purpose of the Module: 1. To provide an overview of feminist and queer theoretical debates, including feminist theory, masculinity studies, queer and transgender theory.
2. To assess critically different theoretical positions in gender and sexuality theory
3. To apply feminist and queer theoretical concepts and arguments to particular substantive topics such as family and work.
4. To examine how gender interacts with other identity markers like age, ethnicity, race, class, ability, sexuality.
5. To identify how notions like identity, self, nation are gendered and culturally constructed.
6. To examine changing cultural representations of feminism, gender and sexuality.

Syllabus: This course will review and critically examine the main theoretical approaches to gender, sexuality and the position of women and men in society, starting in the late eighteenth century, but concentrating on the period from the 1970s onwards. The module will analyse theories about the social and cultural construction of gendered identities, their origin, maintenance and representation. It will pay attention to intersectionality, the connection between gender and other identity markers like age, ethnicity, race, ability, sexuality, class etc. Of central importance is the practical application of different theoretical positions to specific topics like gender and employment, gender and childhood, gender and the body, gender and nationalism, gender and the media, gender and the family.

SO6031 - FEMINIST APPROACHES TO RESEARCH
ECTS Credits: 3

Sociology

Rationale and Purpose of the Module: 1. To examine how knowledge is constructed and deployed and supplement core module on methodology
2. To identify how interdisciplinary feminist perspectives inform research methods.
3. To examine how feminist analysis redefines traditional categories and disciplinary concepts through attention to gender and other social categories such as race, class, culture, sexual orientation, and age.
4. To find, formulate, limit, and state a research question from a feminist perspective; select/combine appropriate feminist research methodologies informed by the course readings and discussion.

Syllabus: This 3 credit module on feminist research methodology will supplement the 9 credit disciplinary research module undertaken by students. It will enable students to bring feminist critiques of knowledge and methodology to their research and writing up the dissertation. Students will address questions such as: What have feminist theorists to say about objectivity and truth? the distinction between knower and known/ self and other/ mind and body/ subject and object? How might we understand culture and society differently if we incorporate reproduction, bodily work, and intimate relations in our research? What might be the limits of feminist standpoint, the idea that women, as a subordinated group, are in a better position to arrive at an adequate representation of social reality than men? What kinds of questions guide feminist research? How do feminist researchers approach the objects of their research? What is the relationship between the object of research and the feminist researcher?

SP4001 - WHO ARE THE SPANIARDS?
INTRODUCTION TO SPANISH CULTURE
ECTS Credits: 6

School of Modern Languages and Applied Linguistics

Rationale and Purpose of the Module: Aims and Objectives:
* To further develop students’ background knowledge of the Hispanic World.
* To explore contemporary socio-political issues and their impact on cultural production in Spain and Latin America.
* To develop students’ analytical skills in the study of contemporary Hispanic culture.
* To prepare students to analyse contemporary socio-political issues in the Hispanic World in a critical manner.

SP4003 - SOCIO-POLITICAL ISSUES IN THE CONTEMPORARY HISPANIC WORLD: SOCIETY, CULTURE AND REPRESENTATION
ECTS Credits: 6

School of Modern Languages and Applied Linguistics

Rationale and Purpose of the Module: The development of Spanish culture has been marked by different attempts at constructing a national identity in different forms, from the attempts at uniformity promoted by the Spanish Empire ùthen re- appropriated by the dictatorship of Francisco Franco- to the re-construction of an identity directed towards the integration of Spain in Europe and, more recently, the attempts to construct an identity which integrates both past and present. Accordingly, the module will pay special attention to the cultural impact of the end of the Spanish Empire, the Spanish Civil War and the Transition to Democracy. After completion of this module, students will have achieved a general but solid knowledge of the main socio-political processes in Spanish history and their effects on and interaction with literary and film production, as well as other forms of culture.

Syllabus: This module offers an introduction to the most important events and movements in Spanish culture. It focuses mainly on the cultural impact of the Spanish Empire, the Spanish Civil War, the dictatorship of Francisco Franco, and the Transition to Democracy. Through the use of literature, music, film and other forms of culture, the module will serve as a platform for the exploration of up-to-date socio-political issues in Spain and their effect on cultural production.
**Syllabus:** This module builds on the foundation modules taken in year one. Students will explore issues of relevance in contemporary society in Spain and Latin America by means of the exploration of up-to-date cultural production about such issues. Accordingly, the module will focus on the politics and representation of gender, cultural constructions of the past and contemporary developments in the construction of national identities. After completion of this module, students will have achieved an in-depth knowledge of contemporary socio-political issues in the Hispanic World and their cultural representation, thus enhancing their understanding of the cultures they will be encountering during their off-campus period.

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**SP4007 - MODERN TRENDS IN HISPANIC CULTURE AND THE ARTS**  
**ECTS Credits:** 6  
**School of Modern Languages and Applied Linguistics**  
**Rationale and Purpose of the Module:** This module offers an introduction to the main artistic forms of expression in the Hispanic world which constituted a break with the traditional canons and therefore signalled the beginning of modernity both in Latin America with the movement of 'Modernismo' and in Spain with the work of the Romantic poet Gustavo Adolfo Bécquer who can be considered a precursor of modern poetry. These artistic forms were the beginning of a move towards modernity which culminated in Surrealism during the second decade of the 20th century. In Spain, after the civil war, artistic resistance to the dictatorship developed in the context of severe censorship and in this respect the module will also deal with cultural forms of resistance to the dictatorship of General Franco.

**Syllabus:** This module will focus on five areas:  
- The Spanish Romantic period in art and poetry (Goya and Bécquer)  
- Latin American 'Modernismo' and its legacy in Spain in the form of the 'Generación del 98'  
- The Poetry of Pablo Neruda  
- The Spanish 'Generación del 27' and the Spanish avant-garde: Surrealism in art and literature  
- Cultural forms of resistance to the Franco regime: The theatre of Buero Vallejo and the 'New Song', a form which often pays tribute to the Spanish poetic tradition.

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**SP4131 - SPANISH FOR BEGINNERS 1 (EUROPEAN STUDIES)**  
**ECTS Credits:** 6  
**School of Modern Languages and Applied Linguistics**  
**Rationale and Purpose of the Module:** The beginners course aims to provide the student with a strong basic knowledge of Spanish and of contemporary Spain and Latin America. The course is designed to:  
- Enable the student to understand and use basic structures of Spanish grammar  
- Expose the student to a range of vocabulary and expressions which will allow her/him to present herself to, and communicate with native speakers of Spanish.  
- To foster autonomous language learning skills.  
- To introduce the student to Spanish and Latin American cultures.  
- To develop listening and speaking skills in Spanish.  
- To equip the student with basic writing skills.

**Syllabus:** Lecture: introduction to Spanish and Latin American history, politics and cultures. These include: the Spanish language and the languages of Spain, socio-cultural and historical background to Spain and Latin America from the formation of the Spanish state and the indigenous cultures of Latin America to the mid-20th century.

Tutorials and lab: working with set text-book, back-up audio-visual and online materials, students are introduced to the concepts of gender, number, verb systems and to the basic structures of the Spanish language.

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**SP4133 - SPANISH FOR BEGINNERS 3**  
**ECTS Credits:** 6  
**School of Modern Languages and Applied Linguistics**  
**Rationale and Purpose of the Module:** Consolidation of the structures, functions and vocabulary taught in the first year and expands grammatical competence to include use of the subjunctive.

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**SP4141 - SPANISH LANGUAGE AND SOCIETY 1**  
**ECTS Credits:** 6  
**School of Modern Languages and Applied Linguistics**  
**Rationale and Purpose of the Module:** The course is designed to:  
- Revise and broaden the student/Es knowledge of the structures of Spanish grammar.  
- Expand the student/Es range of Spanish vocabulary.  
- Improve pronunciation and patterns of intonation in Spanish.  
- Further develop the student/Es language skills by exposing them to different situation and registers, both formal and informal.  
- Facilitate the student/Es understanding of various cultural aspects within the Spanish-speaking world.  
- Foster autonomous language learning.

**Syllabus:** The course is designed to:  
- Revise and broaden the students knowledge of the structures of Spanish grammar.  
- Expand the students range of Spanish vocabulary.  
- Improve pronunciation and patterns of intonation in Spanish.  
- Further develop the students language skills by exposing them to different situation and registers, both formal and informal.  
- Facilitate the students understanding of various cultural aspects within the Spanish-speaking world.  
- Foster autonomous language learning.
SP4143 - SPANISH LANGUAGE AND SOCIETY 3  
ECTS Credits: 6

School of Modern Languages and Applied Linguistics

Rationale and Purpose of the Module: Second year aims to build on and develop the skills introduced in the first year course: increase the oral and written ability of the students, enhance their linguistic competence, present a wide range of Spanish and Latin-American literary and cultural contents and develop further strategies for autonomous language learning.

Syllabus: The advanced course consists of four hours of Spanish per week:
- One grammar class (grammar review and consolidation).
- One literature class (a selection of Peninsular and Latin American short stories and newspaper articles).
- One laboratory/oral class (communication skills).
- One General Lecture

Prerequisites: SP4146

SP4147 - SPAIN EUROPE AND BEYOND  
ECTS Credits: 6

School of Modern Languages and Applied Linguistics

Rationale and Purpose of the Module: By the end of this module students should have:

1. developed further their command of Spanish, by focusing on oral, aural, reading and writing skills.

2. a greater analytical awareness of linguistic issues, developed in particular through translation and critical text analysis activities.

3. a deeper critical understanding of contemporary society, in particular as a result of study of contemporary literature and other text types.

4. the ability to discuss critically a variety of issues relating to Spain and Latin American societies and their connections to both European and global parameters and contexts.

SP4233 - SPANISH LANGUAGE CULTURE AND SOCIETY 3 (BEGINNERS)  
ECTS Credits: 6

School of Modern Languages and Applied Linguistics

Rationale and Purpose of the Module: Consolidation of the structures, functions and vocabulary taught in the first year and expands grammatical competence to include use of the subjunctive. Development of knowledge of contemporary Spain and Latin American cultures and societies, with a particular focus on the most salient socio-cultural/political issues of contemporary Spain and Latin America.

Syllabus: Lecture: further develop the knowledge-base of Spain and Latin America developed in first year and examines some of the salient socio-cultural/political issues of contemporary Spain and Latin America.
Tutorials and lab: Working with set textbook, complementary audio-visual and online material, as well as intermediate difficulty literary texts.

Prerequisites: SP4232

SP4241 - SPANISH LANGUAGE, CULTURAL AND SOCIOLOGY 1  
ECTS Credits: 6

School of Modern Languages and Applied Linguistics

Rationale and Purpose of the Module: The course is designed to:

- Enable the student to understand and use basic structures of Spanish grammar.
- Expose the student to a range of vocabulary and expressions which will allow her/him to present herself to, and communicate with native speakers of Spanish.
- To foster autonomous language learning skills.
- To introduce the student to Spanish and Latin American cultures.
- To develop listening and speaking skills in Spanish.
- To equip the student with basic writing skills.

Syllabus: Lecture: introduction to Spanish and Latin American history, politics and cultures. These include: the Spanish language and the languages of Spain, socio-cultural and historical background to Spain and Latin America from the formation of the Spanish state and the indigenous cultures of Latin America to the mid-20th century.
Tutorials and lab: working with set text-book, back-up audio-visual and online materials, students are introduced to the concepts of gender, number, verb systems and to the basic structures of the Spanish language.

Prerequisites: SP4231

SP4242 - SPANISH LANGUAGE, CULTURAL AND SOCIOLOGY 2  
ECTS Credits: 6

School of Modern Languages and Applied Linguistics

Rationale and Purpose of the Module: The beginners course aims to provide the student with a strong basic knowledge of Spanish and of contemporary Spain and Latin America.

The course is designed to:

1. To equip the student with basic writing skills.

Syllabus: Central focuses of the syllabus, in addition to the development of overall language competence, are cultural, linguistic and political aspects of Spain and Latin America; issues of relevance to both Spain and Ireland and Hispanic perspectives on European and global questions. The module places a particular linguistic emphasis on questions of register and style in Spanish.

Prerequisites: SP4142
SP4243 - SPANISH LANGUAGE, CULTURE AND SOCIETY 3
ECTS Credits: 6
School of Modern Languages and Applied Linguistics

Rationale and Purpose of the Module: Second year aims to build on and develop the skills introduced in the first year course: increase the oral and written ability of the students, enhance their linguistic competence, present a wide range of Spanish and Latin-American literary and cultural contents and develop further strategies for autonomous language learning.

Syllabus: The advanced course consists of four hours of Spanish per week:
- One grammar class (grammar review and consolidation).
- One literature class (a selection of Peninsular and Latin American short stories and newspaper articles).
- One laboratory/oral class (oral communication skills).
- One General Lecture

Prerequisites: SP4242

SP4247 - SPANISH LANGUAGE, CULTURE AND SOCIETY 5
ECTS Credits: 6
School of Modern Languages and Applied Linguistics

Rationale and Purpose of the Module: By the end of this module students should have:

1. developed further their command of Spanish, by focusing on oral, aural, reading and writing skills.
2. a greater analytical awareness of linguistic issues, developed in particular through translation and critical text analysis activities.

SP4627 - TWENTIETH CENTURY TRENDS IN HISPANIC LITERATURE
ECTS Credits: 6
School of Modern Languages and Applied Linguistics

Rationale and Purpose of the Module: AIMS AND OBJECTIVES:
* To analyse the major cultural developments in Hispanic literature of the twentieth century and to focus in particular on four major trends:
  - Latin American modernismo and its legacy in Spain.
  - Surrealism in art and literature.
  - Magical realism.
  - The 1980s boom in womenÆs writing with particular regard to the relationship between feminism(s) and popular culture.
* To further develop studentsÆ analytic and interpretative skills.
* To develop studentsÆ critical skills when analysing cultural production.

Syllabus: One weekly lecture to examine the historical context of the four major areas and two tutorials in which the literary texts will be studied in detail. The module is divided into four units:
1. Modernism:
   - Introduction to Modernismo: Europe and Latin America.
2. Surrealism:
   - Spanish Modernismo: Antonio Machado and Juan Ramn Jimnez.
   - Surrealism: Rafael Alberti, Federico GarcÝa Lorca and Salvador DalÝ.
3. Magical Realism:
   - Alejo CarpentierÆs lo real maravilloso; Juan Rulfo, Elena Garro, Gabriel GarcÝa MÝrquez, Isabel Allende.
4. WomenÆs writing in Spain and Latin America: Josefina Aidecoa, Dulce Chacn, LucÝa Etxebarria, and Isabel Allende, Rosario Castellanos, ZoÕ ValdUs and Alicia Kozameh.

Prerequisites: SP4625

SS4128 - APPLIED SPORT PSYCHOLOGY
ECTS Credits: 6
Physical Education & Sport Sciences

Rationale and Purpose of the Module: The emphasis in this course is on the application of psychological concepts, skills and strategies to applied settings in sport for performance enhancement. Specifically, students will explore the social and psychological factors related to sport participation and peak sport performance.

Syllabus: Content relating to performance enhancement includes psychological characteristics of peak performance, characteristics of elite athletes and their development, increasing of awareness; selected mental skills and strategies (e.g. muscle relaxation, autogenic training, meditation, self talk, plans & routines, simulation training); guidelines and procedures for implementing intervention strategies; conducting mental skills training programmes. Attention will also be given to the environment in which sport occurs focusing on aspects of group dynamics.

SS4145 - PERCEPTION AND COGNITION IN ACTION
ECTS Credits: 6
Physical Education & Sport Sciences

Rationale and Purpose of the Module: To advance the students knowledge and understanding of the scientific methods used to gain an understanding of how motor skills
are interpreted, controlled and learned. To provide students with frameworks for the analysis of motor cognition and insights for the facilitation of acquisition, retention and transfer of motor skills.

**Syllabus:** Review of the perceptual, cognitive and motor learning processes. Measuring motor skill performance and learning; retention and transfer tests; novice and expert differences. Scientific evidence for changes due to learning. The scientific method; observation, formulation & testing of laws & principles, Hick’s Law, Fitts’E Law; theories to explain observations, principles & laws; Adams’E closed loop theory, Schmidt/E’s schema theory, motor cognition approaches. Roles of vision and proprioception in the control of movement; visual search; open loop and closed loop systems of control; motor programmes. The structuring of practice (e.g. frequency & spacing, variability, random & blocked) and its effects on learning. Implicit learning. Demonstration and learning. Instruction and learning. Feedback for learning. Whole-part practice. Learning from a dynamical systems perspective. Application of principles and of research findings. Role of practice and related factors in achieving excellence/expertise.

**SS4202 - INTRODUCTION TO MAJOR PHYSIOLOGICAL SYSTEMS**

ECTS Credits: 6

Physical Education & Sport Sciences

**Rationale and Purpose of the Module:** A thorough understanding of how the body functions underpins all subject areas in the study of sport, exercise sciences and physiotherapy. Physiology (from Greek Physio meaning nature and -logy meaning the study of) deals with the coordinated activities of cells, tissues, organs and systems. In this module students are introduced to the basic structures and functions of human physiological systems and the integration of these systems to maintain homeostasis.

**Syllabus:** NA

**SS4203 - PHYSIOLOGY OF MUSCLE IN MOVEMENT**

ECTS Credits: 6

Physical Education & Sport Sciences

**Rationale and Purpose of the Module:** This module aims to deliver a thorough knowledge and understanding of skeletal muscle function. It will allow students to understand how skeletal muscle adapts to exercise, training and disease. By the end of the module students should have a full understanding of the Physiology of muscle applicable in sport and exercise sciences and in physiotherapy.

**Syllabus:** Skeletal muscle structure at the tissue and cell level. The process of muscle contraction at the ultrastructural and whole muscle level. The Physiology and energetics of the muscle contraction process adn cross bridge cycle. Motor units and muscle fibre types. Functional properties of the different muscle fibre types. Sources and consequences of skeletal muscle fatigue. Muscle training; neural and physiological adaptations to strength and endurance training. Muscle damage and muscle repair. Muscle disease and injury. Treatments for muscle injury and recovery.

**Prerequisites:** SS4202

**SS4205 - NUTRITION, EXERCISE METABOLISM AND SPORTS PERFORMANCE**

ECTS Credits: 6

Physical Education & Sport Sciences

**Rationale and Purpose of the Module:** Probably greater than any other component of the physiology syllabus, the application of good nutritional practice and nutritional manipulation has made a significant impact upon general health and sporting performance. This course is designed to provide a thorough understanding of the nutritional needs of exercise, exercise metabolism and the use and abuse of nutritional (ergogenic) aids to improve health, training and competitive performance.


**Prerequisites:** BC4002

**SS4217 - EXERCISE AND HEALTH**

ECTS Credits: 6

Physical Education & Sport Sciences

**Rationale and Purpose of the Module:** This is a module which brings together the knowledge you gained in the last three years to investigate aspects of exercise and health. These include sport performance, lifestyle and general well being. Included in this module are examples of how exercise may be used prospectively to improve the quality of life and also as an adjunct therapy to clinical medicine in the treatment of life-threatening disease. Underpinning this content is the filed of physical activity science and exposure which explores physical activity behaviour determinants, recommendations, measurement, interventions, levels and policy and promotion.

**Syllabus:** The module delivers core knowledge in lecture format. Further understanding and breadth are gained by self directed learning.

**SS4231 - HUMAN PHYSIOLOGICAL SYSTEM FOR SPORT AND EXERCISE SCIENCES**
**SS4402 - ADVANCED BIOMECHANICS ANALYSIS**

ECTS Credits: 6

Physical Education & Sport Sciences

Rationale and Purpose of the Module: Aims:

* To consolidate students' understanding of kinematics analysis by more advanced biomechanical analysis skills in

2D and 3D analysis of motion

* Apply 3D analysis techniques to selected sporting and exercise activities

**Syllabus:** Syllabus:

[ Kinematic Conventions - Absolute spatial reference system, Total description of segments in 3D space. Advanced smoothing techniques: use of cubic and quintic splines and FFT. Advanced use of link segment equations and free body diagrams. Calculation of joint forces and moments of force. Interpretation of moment of force curves. ]

Mechanical work, energy and power: Internal versus external work, Energy transfer between body segments, Energy exchanges within segments. Review of forward solution models. Effects of orthotics on gait. Examination of footwear and sports equipment design.

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**SS4312 - QUALITATIVE BIOMECHANICAL ANALYSIS**

ECTS Credits: 6

Physical Education & Sport Sciences

Rationale and Purpose of the Module: While a sound knowledge of anatomical structure is important for effective analysis of human movement activity - Analysis requires in-depth understanding of how forces act on joints and how joint structure affects movement. There is a need for the sport scientist and physical education specialist to develop effective skills qualitatively analyzing human movement, it causes and effects, through a synthesis of knowledge of anatomy and of basic mechanics. There is also a need to encourage the student to focus on the applied nature of anatomy and biomechanics in sport and physical education. An emphasis on applied nature of this knowledge to sports performance will be achieved through extensive practice in the application of deterministic models of performance, and examination of overall performance objectives, biomechanical factor and principles and critical features of performance in a wide range of sport and exercise activities. The emphasis on this module will be on developing the student's skill in analysing movement without direct measurement and developing the ability to recommend ways of improving performance or learning as an outcome of qualitative analysis.

**Syllabus:** Syllabus:

Prerequisites: SS4402

SS4411 - COACHING SCIENCE AND PERFORMANCE 1
ECTS Credits: 3

Physical Education & Sport Sciences

Rationale and Purpose of the Module: To give students a basic proficiency, understanding and appreciation of rules, principles, tactics and demands of a selected sport. To introduce students to basic coaching skills and current issues.

Syllabus: Sports: Students will learn about and through a selective individual/dual sport. In addition to sport specific content (skills and tactics), common elements of coaching and applied physical conditioning will be included. Pedagogy: Criteria for effective coaching, philosophy and role of the coach, coaching styles, communication, group organisation and management, demonstrations, safety and ethics in sport.

SS4417 - HUMAN PERFORMANCE EVALUATION
ECTS Credits: 6

Physical Education & Sport Sciences

Rationale and Purpose of the Module: To gain insights into how human performance objects in sport and health are achieved by integrating as appropriate knowledge and techniques associated with the disciplines of physiology, biomechanics, psychology and exercise and health. Effective application of measurement, testing, interpretation and evaluation techniques associated with the named disciplines will be a key focus of the module.

Syllabus: This is a final year integrative module that aims to complement research skills gained in the sport and exercise science final year project with practical skills and experience in sport and exercise evaluation. The course will consist of lectures on the theory and practice of performance evaluation in an integrative format to make the students critically aware of appropriate testing for different populations and the on an individual basis students will prepare a comprehensive piece of written work on effective evaluation processes pertaining to human performance and functioning in the context of sport and health. In a team-based exercise, students will make a seminar presentation on an effective evaluation process for a specific scenario in the sport and health domain.

SS6002 - APPLIED SPORT PSYCHOLOGY
ECTS Credits: 6

Physical Education & Sport Sciences

Rationale and Purpose of the Module: The emphasis in this course is on the application of psychological concepts, skills and strategies to applied settings in sport for performance enhancement. Specifically, students will explore the social and psychological factors related to sport participation and peak sport performance.

Syllabus: Content relating to performance enhancement includes psychological characteristics of peak performance, characteristics of elite athletes and their development, increasing of awareness; selected mental skills and strategies (e.g. muscle relaxation, autogenic training, meditation, self talk, plans & routines, simulation training); guidelines and procedures for implementing intervention strategies; conducting mental skills training programmes. Attention will also be given to the environment in which sport occurs focusing on aspects of group dynamics.

SS6011 - ANALYSIS OF MOTOR SKILL PERFORMANCE AND LEARNING
ECTS Credits: 6

Physical Education & Sport Sciences

Rationale and Purpose of the Module: To give knowledge and understanding of how movement skills are controlled during performance and also how they are best practised and learned. Course content will be based on research findings and theories which will be critically reviewed. There will be a strong applied dimension with the purpose of providing students with a theoretical basis for making informed decisions regarding the structuring of practice for motor skills. The module would be of interest to those from a variety of disciplines and areas involving motor skill performance and learning e.g. sport, dance, rehabilitation, industry, ergonomics.

SS6002 - APPLIED SPORT PSYCHOLOGY
ECTS Credits: 6

Physical Education & Sport Sciences

Rationale and Purpose of the Module: The emphasis in this course is on the application of psychological concepts, skills and strategies to applied settings in sport for performance enhancement. Specifically, students will explore the social and psychological factors related to sport participation and peak sport performance.

Syllabus: Content relating to performance enhancement includes psychological characteristics of peak performance, characteristics of elite athletes and their development, increasing of awareness; selected mental skills and strategies (e.g. muscle relaxation, autogenic training, meditation, self talk, plans & routines, simulation training); guidelines and procedures for implementing intervention strategies; conducting mental skills training programmes. Attention will also be given to the environment in which sport occurs focusing on aspects of group dynamics.

TE4011 - ENGLISH AS A FOREIGN LANGUAGE 1 (INTERMEDIATE)
ECTS Credits: 6

School of Modern Languages and Applied Linguistics

Rationale and Purpose of the Module: To provide language support to students on the Erasmus exchange programmes to enable them to benefit more fully from their Erasmus experience at a social, cultural and academic level. To provide integrated tuition and practice in the four language skills of listening, speaking, reading and writing.

Syllabus: Students work from a set text book, back-up audio visual and on-line material. Practice is given in the four language skills, language awareness-raising and with special emphasis on pronunciation at this level. The following grammatical areas are covered: verb tenses e.g. present simple and continuous, past simple and continuous, future forms, present perfect simple and continuous; modality and conditionalilty; modal verbs expressing obligation, deduction, possibility and ability, first conditional lexis e.g. frequent collocations, common expressions, conversational responses and idioms, qualifying using adverbs and adjectives, comparatives and superlatives, discourse markers (oral and written) e.g. connectives,
TE4021 - ENGLISH AS A FOREIGN LANGUAGE 1 (UPPER INTERMEDIATE)
ECTS Credits: 6

School of Modern Languages and Applied Linguistics

Rationale and Purpose of the Module: To provide language support to students on the Erasmus exchange programmes to enable them to benefit more fully from their Erasmus experience at a social, cultural and academic level.

To provide tuition and practice in the four language skills of listening, speaking, reading and writing.

Syllabus: Students work from a set text book, back-up audio visual and on-line material.

Integrated tuition and practice is given in the four language skills.

The following grammatical areas are covered: Phrasal verb structure, position of adverbs, future time forms, conditionals, narrative tenses, modal verbs of deduction: e.g. frequent collocations, common expressions, conversational responses and idioms, discourse markers (oral and written): e.g. connectives, sequencing, signposting.

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TE4031 - ENGLISH AS A FOREIGN LANGUAGE 1 (ADVANCED)
ECTS Credits: 6

School of Modern Languages and Applied Linguistics

Rationale and Purpose of the Module: To provide language support to students on the Erasmus exchange programmes to enable them to benefit more fully from their Erasmus experience at a social, cultural and academic level.

To provide tuition and practice in the four language skills of listening, speaking, reading and writing.

Syllabus: Students work from a set text book, back-up audio visual and on-line material.

Integrated tuition and practice is given in the four language skills.

The following areas are covered: grammar; modals and meaning, the perfect infinitive, mixed conditionals, tenses in accounts and narratives, all aspects of reported speech: Lexis: word-building, compound adjectives, synonyms, confusable words, metaphorical language, intensifying adverbs, discourse markers, phrasal verbs, collocations, British v American English; Recognition and use of the IPA; future forms, wishes and regrets, defining and non-defining relative clauses, noun clauses, adverb clauses, perfective v progressive aspect, gerunds, infinitives.

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TW4003 - INTRODUCTION TO TECHNICAL COMMUNICATION
ECTS Credits: 6

School of Culture and Communication

Rationale and Purpose of the Module: This module is designed to replace TW4115: Principles of Professional and Technical Communication and Information Design. This module is being developed to fully de-couple undergraduate and postgraduate modules which were historically taught together, but are now fully separate. The new title is also clearer. The module's purpose is to introduce students to the disciplines of technical and professional communication and information design. To establish a rigorous standard in the writing of clear, concise, correct English; to develop the students' expertise in using the tools of the profession, including restructuring to maximise tax reliefs. Current

Rationale and Purpose of the Module: To introduce students to the disciplines of technical and professional communication and information design. To establish a rigorous standard in the writing of clear, concise, correct English appropriate for technical communication.

To develop the students' ability to choose appropriate writing styles for a range of technical communication genres and diverse audiences.

To provide practice through a range of assignments designed to improve the students' performance in creating different types of documentation: manuals, brochures etc.

To develop the students' expertise in using the tools of the profession.

Syllabus: Introduction to technical communication: audience analysis; writing style for technical and professional communication.

Introduction to information design: typography; colour; graphics and illustrations, page and screen layout.

Document genres: writing manuals; designing and writing brochures; writing for new media.

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TW4115 - Principles of Professional and Technical Communication and Information Design
ECTS Credits: 6

School of Culture and Communication

Rationale and Purpose of the Module: To introduce students to the disciplines of technical and professional communication and information design. To establish a rigorous standard in the writing of clear, concise, correct English appropriate for technical communication.

To develop the students' ability to choose appropriate writing styles for a range of technical communication genres and diverse audiences.

To provide practice through a range of assignments designed to improve the students' performance in creating different types of documentation: manuals, brochures etc.

To develop the students' expertise in using the tools of the profession.

Syllabus: Introduction to technical communication: audience analysis; writing style for technical and professional communication.

Introduction to information design: typography; colour; graphics and illustrations, page and screen layout.

Document genres: writing manuals; designing and writing brochures; writing for new media.

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TX4007 - TAXATION FOR CORPORATES
ECTS Credits: 6

Accounting & Finance

Rationale and Purpose of the Module: This module aims to provide an understanding of Irish Corporation Tax, the rationale for incorporation of a business, the taxation implications of close company status and the effective use of losses and group reliefs. It also introduces students to the principles of Value Added Tax (VAT) and the application of VAT in a business context.

Syllabus: General principles of Irish Corporation Tax. The rationale for, and the tax implications of, incorporation. Computation of the corporation tax liability. Loss relief for companies, group relief for losses, charges and transfer of assets. Close companies, definition and consequences. Tax planning for companies including restructuring to maximise tax reliefs. Current
issues in Corporation Tax. Introduction to VAT, general principles, administration, registration and deregistration, exemptions and zero rating, inter EU sales and purchases. VAT on property transactions.

TX4204 - CAPITAL TAXATION
ECTS Credits: 6

Accounting & Finance

Rationale and Purpose of the Module: This module is designed to provide students with an understanding of the theoretical and legal framework of capital taxation. It aims to give students a thorough understanding of the manner in which individuals taxed in the State on the disposal of assets.

Syllabus: Introduction to Capital Gains Tax; Calculation of Capital Gains Tax; CGT Exemptions & Relief; CGT Retirement Relief; Transfer of a Business to a Company; CGT and Share Transactions CGT and Liquidation of Companies; Company Purchasing Its Own Shares; Principle Private Residence Relief; CGT and Development Land; Introduction to Capital Acquisitions Tax; Basic Concepts & Relief; Business Relief; Agricultural Relief; Taxation of Trusts; Foreign Aspects; Stamp Duty.

TX4305 - TAXATION THEORY AND PRACTICE
ECTS Credits: 6

Accounting & Finance

Rationale and Purpose of the Module: This module is designed to provide students with an understanding of the theoretical and legal framework of taxation. It aims to give students a thorough understanding of the manner in which individuals and unincorporated businesses are taxed in the State. The module reviews the taxation implications of business decisions and introduces the basics of tax planning.

Syllabus: Introduction to the theory of taxation and basic tax policy; overview of Irish income tax system; the self-assessment system; personal tax computations; Schedule E employment income, benefits in kind and termination payments; interest income, rental income, foreign income, dividend income; the taxation treatment of married couples; the measurement of taxable business profits, allowable and disallowable expenditures, commencement and cessation of trading; capital allowances, balancing allowances and charges; the effects of residence and domicile of individuals on tax liability; basics of tax planning; the annual budget.

WT4003 - CONSTRUCTION TECHNOLOGY AND MANAGEMENT 2
ECTS Credits: 6

School of Engineering

Rationale and Purpose of the Module: The aim of this module is to provide a comprehensive introduction to industrial, high-rise and construction practice and technology.

Key objectives

Provide knowledge of

* Organising and selecting resources needed to successfully complete the project
* The principles of erecting large structures and the various forms they take.
* Internal and external components of industrial and high rise structures.

Syllabus: Site works, site layout, electricity on building sites; Plant and equipment; Substructure construction, ground water control, deep trench excavations, cofferdam and caissons, tunnelling and culverts; Underpinning, piled foundations; Demolition and temporary works, Portal frames; Introduction to highrise construction, Introduction to fire protection; Claddings to framed structures; Formwork systems; Pre-stressed concrete; Industrial buildings.

Prerequisites: WT4502, WT4401

WT4017 - ENERGY EFFICIENT BUILDINGS
ECTS Credits: 6

School of Engineering

Background: Energy supply and demand, climate change, energy performance of buildings directive and Irish legislation, technical guidance documents Part-L.

Energy: Supply and demand considerations for domestic buildings (new and existing)

Concepts of Temperature and Heat Energy: Concepts of conduction, convection and radiation; thermal bridging; heat energy and energy losses of materials; U-value; heat loss and heat gain; energy performance; thermodynamics and heat; energy balance; air flow and energy transfer.

Electrical and Lighting Energy assessment: Principles of measurement from plans, surveys and drawings; electrical measurements; electrical devices and efficiency.

Energy Efficiency, Energy Storage and Control: Fundamental principles; principles of energy storage; heat capacity; thermal mass; heat and water; temperature measurements and control; energy sources; energy conversions; fuel, combustion and CO2 emissions; greenhouse gases; carbon dioxide emission rating; solar energy; thermal mass; solar gains; solar collectors; efficiency adjustment factors; primary and secondary heating systems; single and immersion heaters; carbon dioxide emission rating.

Building Energy Ratings in domestic buildings; Use of Dwelling Energy Assessment Procedures (DEAP) software for new and DEAP+ for existing buildings; generation of advisory reports.

Introduction to BER in non-domestic buildings;


Prerequisites: WT4503

WT4117 - STRUCTURAL DESIGN
ECTS Credits: 6

School of Engineering

Rationale and Purpose of the Module: The aim of this module is to provide a basic understanding of structures and the design of principal structural elements.

Syllabus: Basic structural concepts and material properties, design loads, limit state design principles, beam design, axially loaded column design, column base & splice details, design of tension members and compression members, design of simple connections, trusses and bracing, floor design, introduction to structural detailing; bearing pressures, design of shallow foundations, introduction to lateral stability.

Prerequisites: WT4503
WT4401 - CONSTRUCTION TECHNOLOGY AND MANAGEMENT 1
ECTS Credits: 6

School of Engineering

Rationale and Purpose of the Module: The aim of this module is to provide a comprehensive introduction to every aspect of the technology of domestic low-rise construction, and to present this in a rational and logical progression reflecting the construction process.


WT4503 - STRUCTURAL MECHANICS
ECTS Credits: 6

School of Engineering

Rationale and Purpose of the Module: To develop the student's understanding of:
* force systems
* criteria for structural design
* structural behaviour

Syllabus: SI units and manipulation of formulae, sources and types structural loading, reactions and supports, free body diagrams, shear force and bending moment calculations, static determinacy and indeterminacy, qualitative analysis of beams and frames, stability and analysis of pin jointed frames, section properties, engineers equation of bending.

These topics will be covered through lectures, tutorials, experimentation and problem solving projects.

WT4505 - BUILDING ECONOMICS
ECTS Credits: 6

School of Engineering

Rationale and Purpose of the Module: The overall aim of this module is to illustrate the application of economic principles to the building and construction process.

Specific objectives include providing the student with;
* An overview of the construction industry and its role in the economy
* An understanding of the construction firm and its management from an economic perspective
* The economic considerations in evaluating building projects and making decisions.

Syllabus: The construction industry, its economic development, structure and role in the economy, construction as a production process. Management of firms, costs, revenues and markets from the point of view of economists and managers. strategic decision making in property development and project appraisal and feasibility studies. Linking the economics of the production process of construction to the economics of its output, buildings and structures of the built environment. Cost modelling techniques, cost and price forecasting, cost product and process modelling, dealing with uncertainty. Building design, its interaction with the construction process in determining the cost and quality of buildings. The economics of buildings essential resources, energy efficiency and its cost. Cost limits and values, determining value for money Commercial values and the property market.

Prerequisites: WT4804

WT4507 - FORENSIC ENGINEERING AND ETHICS

ECTS Credits: 6

School of Engineering

Rationale and Purpose of the Module: This module introduces the important subject of ethics through the study of engineering failures. Well-documented case studies, project work and invited speakers form an intrinsic part of achieving the following key objectives:
* To promote ethical behaviour throughout the student's personal, university and professional lives.
* To demonstrate the value of learning from engineering failures.
* To emphasise the scientific method in engineering practice.
* To emphasise the importance of effective communication.

Syllabus: Reasons for failures in engineering; Modes of failure; Risk; Failure case histories in concrete, steel, masonry, foundations and timber etc; Common pitfalls, Fiedler's ten basic rules; Nonstructural failures; Learning from failures; Forensic engineering practice; Conducting a forensic engineering investigation; Writing a forensic engineering report; Ethics and Responsibilities, Standard of Care; Rules of evidence, Depositions, Arbitration.

These topics will be addressed through PBL exercises involving individual and/or team challenges. The module assessment is by 60% CA work and 40% end of semester examination. Examples of CA work include class debates (e.g. cases involving ethical dilemmas faced by engineers such as Citicorp building N.Y.), individual online quizzes on ethics, individual online quizzes on forensic engineering, team based forensic engineering projects requiring presentations and report writing.

Cross faculty collaboration on projects involving law and architecture is also encouraged on this module.

WT4605 - PROCUREMENT AND CONTRACTING
ECTS Credits: 6

School of Engineering

Rationale and Purpose of the Module: The aim of this module is to provide an understanding of the different forms of contract and their commercial implications, and
provide project managers with an overview of the procurement and contracting processes as part of the overall project management process.

The specific objectives are to provide learners with the knowledge of:
* The different types and forms of contract used in procuring services for projects.
* The principle elements of a contract and contract law
* Standard contract forms and how they are used in the various stages of the project lifecycle
* The procurement process and the perspectives of different parties
* Contract administration, issues underlying disputes and claims.


Prerequisites: WT4804, WT4704

WT4705 - BUILDING PRODUCTION
ECTS Credits: 6

School of Engineering

Rationale and Purpose of the Module: To introduce the student to the science and art of New Product Development within the construction domain. It links the manufacturing and construction skills learnt in earlier modules with the design process and these are brought together by means of a project. The project is intended to take the student through the basic design process into requirements engineering, market analysis, materials, manufacturing processes and the production of an initial business plan.


Prerequisites: WT4401, WT4502, WT4003

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WT4707 - CONSTRUCTION TECHNOLOGY AND MANAGEMENT 3
ECTS Credits: 6

School of Engineering

Rationale and Purpose of the Module: The aim of this module is to provide an understanding of overall project management process and principles and how they apply to construction projects.

Syllabus:
* Managing Resources and Costs
* Communications & Change Control Management û Site Meetings and Progress Reports
* Leadership and Negotiation Skills on Construction Projects
* Construction Risk Management û Identification, Analysis, Response and Control
* Construction Productivity Improvement - Define, Measure, Analyze, Improve and Control

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