**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**

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<td>SEN</td>
<td>Faculty of Science &amp; Engineering</td>
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<td>AHS</td>
<td>Arts, Faculty of Humanities &amp; Social Sciences</td>
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<td>EHS</td>
<td>Faculty of Education &amp; Health Sciences</td>
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<td>HUM</td>
<td>Irish World Academy of Music &amp; Dance</td>
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**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.
AC4002 - MANAGERIAL ACCOUNTING
ECTS Credits: 6
Accounting & Finance

Rationale and Purpose of the Module: The aim of the module is to introduce students to the basic techniques, language and principles of management accounting. The module provides students with an insight into the role of management accounting as a provider of information supporting the financial decision making process of an organisation.

Syllabus: The syllabus covers fundamental issues including basic cost terms, concepts, and definitions before introducing costing systems such as full costing and Activity Based Costing. In addition to preparing basic budgets, the difficulties that are inherent within any budgeting system are presented. Students learn to analyse and explain the major causes of differences between budget and actual performance, including basic standard costs and variances. The relationship between accounting information and managers decisions in a competitive environment is demonstrated. Students learn to conduct a financial analysis to support a range of business decisions such as pricing, make v buy, limiting factor of production, discontinuation of product line, customer or market etc. Strategic management accounting is introduced. Techniques such as target costing, value chain analysis and total life-cycle costing are discussed in addition to tools for measuring performance such as the balanced scorecard.

AC4004 - AUDITING AND ACCOUNTING FRAMEWORKS
ECTS Credits: 6
Accounting & Finance

Rationale and Purpose of the Module: The purpose of this module is to present the regulatory, legislative and governance requirements for financial reporting. The presentations contained in the resulting financial statements are challenged by the student availing of the principles of auditing to determine the adequacy of accompanying disclosures. In this way, the student comprehends the audit process led by a accounting professional as underpinning the credibility of the financial reporting process. As business transactions, be it local or global, rely hugely on this credibility, the role of the accountant as a responsible and ethical professional is emphasised.

Syllabus: Knowledge is imparted through lectures and tutorials and the completion of a case study requiring an analysis of the annual report of an assigned publicly traded company. The first series of lectures covers accounting regulation and its conceptual underpinning of accrual basis, going concern and accounting policies relating to revenue recognition and fair value. This is followed by lectures covering auditing principles and concepts, the internal control system (ICS) and auditing procedures that examine the ICS and finally the auditor’s opinion. A third series of lectures introduces corporate governance, its key functions of accountability, responsibility and transparency and the governance mechanisms that deliver corporate transparency. Study of the audit-performance expectations gap with an emphasis on professional and ethical responsibilities of the auditor completes the module.

Prerequisites: AC4001, AC4002

AC4018 - CORPORATE TRANSPARENCY AND BUSINESS ETHICS
ECTS Credits: 6
Accounting & Finance

Rationale and Purpose of the Module: 1. Understand the control mechanisms of governance and financial transparency that infer the credibility of financial reporting.
3. Explore the elements of a professional judgement as an approach to making ethical decisions in business.
4. Understand that corporate compliance is fundamental to corporate social responsibility.


Prerequisites: AC4001, AC4004, AC4305

AC4024 - FINANCIAL ACCOUNTING AND REPORTING
ECTS Credits: 6
Accounting & Finance

Rationale and Purpose of the Module: The aim of this module is to develop a students understanding of the theoretical framework of accounting. It introduces the student to the translation of accounting theory, concepts and principles into accounting regulation and practice. It encourages the student to evaluate selected international accounting 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 to external users of financial information, especially, but not exclusively, equity investors. The 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.

AC4214 - ACCOUNTING FOR FINANCIAL DECISION MAKING
ECTS Credits: 6
Accounting & Finance

Rationale and Purpose of the Module: This module introduces non-business students to the fundamental concepts and practices of management accounting and finance. It provides students with the skills and knowledge necessary to identify the relevant financial information required to manage the financial and operating resources of a business.
Syllabus: This module is structured to provide non-business students with a basic understanding of both management accounting and finance. Management accounting provides information for product/service costing and profit determination in addition to information for planning, control and decision-making. Finance is concerned with the ways in which funds for a business are raised and invested. The topics covered include the relationship between financial and management accounting, costing, budgeting, short-term decision making, strategic management accounting, sources of finance, investment appraisal and management of working capital. This module is designed to be a prerequisite for the module AC4417 Management Accounting 1.

AC4418 - MANAGEMENT ACCOUNTING 2
ECTS Credits: 6
Accounting & Finance

Rationale and Purpose of the Module: This module further enhances students 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: This module will cover inventory costing; information and the decision process; cost accumulation information for decision-making; relevant costs and revenues for decision-making; Process costing; Cost allocation and customer profitability analysis; Performance measurement; Transfer pricing and multinational considerations; Pricing; Balanced scorecard.

Prerequisites: AC4417

AR4002 - DESIGN STUDIO 1B
ECTS Credits: 15
School of Architecture

Rationale and Purpose of the Module: The aim of First year Design Studio is to enable the student to become an active participant in the architectural design process. The field of architecture is broad and the methodologies used to work within it varied. In addition, architecture interacts closely with a number of related disciplines.

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.

Syllabus: Design Studio is the backbone of study in Architecture. Study is organised around design aproblemsE or projects, a number of which are given each term.

By working through the project, the student will become exposed to the architectural design process, a new and complex process for most first year students. Each project introduces a different aspect of the architectural design process in order to help the student develop a range of methods of working.

Each project also introduces a new programmatic theme so that students understand and become conversant with the many fields of operation of an architect. Themes include space and light explorations through model making, understanding the process of abstraction and transformation through model making/two dimensional work, building full scale structures in timber to explore architectural concepts such as scale, framing, section and thresholds, developing observational skills through sketching on site, learning how to make a site plan by developing a pattern of occupation on an open site, learning how to develop a building design grounded in this context.

Studio work is organised so that close contact is maintained with the student. Work is analysed and discussed with the student on an individual basis and within the group. The student is taught to recognise the design process and to value and catalogue their own work. As the year progresses the student is encouraged to become increasingly responsible for organising and developing their own work process.

The 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: AR4001

AR4004 - DESIGN STUDIO 2B
ECTS Credits: 15
School of Architecture

The focus of this term is housing: through analysis, research, visits, lectures, and project work students will explore the problem of housing conceptually, functionally, and spatially, as a basic human need, as a social construct, as an economic system, and as a physical thing.

- Spatial model study of housing in a specific cultural context.
- Aspects to be studied: spatial relation to land, territory, climate, privacy, social interaction, interior spatial organisations
- Means of study: intuitive and structured modelling in mix, studies in situ and sketching
- * Means of study: intuitive and structured modelling in mix, studies in situ and sketching
- * Aspects to be studied: spatial relation to land, territory, climate, privacy, social interaction, interior spatial organisations

- Land, structure, climate and materials:
  - a. Spatial logistics and spatial politics. Geometry and human occasion. Types, patterns, and spatial logistics: The maisonette, the dwelling unit, patterns of repetition, link to Irish house and housing traditions.
  - b. Reconstructing Space. Parallel to first year program: Drawing of works by various architects

The essence of the detail and its influence and relation to character of the whole.

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: AR4003

AR4006 - DESIGN STUDIO 3B
ECTS Credits: 15
School of Architecture

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 second term is on developing a project to a high level of detailed design. The pedagogical focus is on developing, in each student, a capacity to interrogate the project through different inputs and to push the project ahead. At the end of the semester the student should have developed an architectural project by interrogating a range of inputs through disparate means and successfully resolved these.

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 student’s 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 means and successfully resolved these.

**AR4008 - DESIGN STUDIO 4B**
ECTS Credits: 18

**School of Architecture**

**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 will develop a method of research and allocate significant time to the research part of the curriculum. The architectural project will be tightly allied to construction and the physicality of building; construction technology will be an important part of the years work.

In the spring semester students are expected to measure their design ability against tightly drawn demands and complex programmatic issues within a sophisticated cultural and architectural framework - to create a complex architectural object. Design Studio will facilitate more inventive/experimental work, leveraging the knowledge of what students are already able to do. Design projects require an integrated technological proposition in terms of structure, construction, materials, and environment at an advanced level.

**AR4012 - GRAVITY AND REACTION 2**
ECTS Credits: 3

**School of Architecture**

**Rationale and Purpose of the Module:** Give students an understanding of a small 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:** Continued Introduction to structural concepts. Topics covered will be Pin joined frames, Parallel chord cantilever truss multiple point load. Parallel chord cantilever truss: uniformly distributed load Pitched roof truss, Internal Forces in Beams, Axial, shear bending definitions, corresponding internal stress states, simplified models of stress states. End load cantilever with uniformly distributed load, Simply Supported Beam: mid-span point load with deflection, Simply Supported Beam: 2 point loads, Simply Supported Beam: uniformly distributed load with deflection, Supported Beam: partial uniformly distributed load, 3 Pin frame with vertical point load, 3 Pin frame with horizontal point load., 3 Pin frame with uniformly distributed load, Qualitative analysis: Frames, deflected shapes, tension zones in bending, axial force, shear force. Students will Construct:

(a)* A cantilever truss with 1.0kg point load and a slender braced bottom chord. 1.0m long 200mm deep (2 groups).

(b)* A simply supported beam and a fixed ended beam (same section) with mid span point loads 1.0kg approx.

* Measure deflections (2 groups).

(c)* A cantilever beam 1.0m long with a 1.0kg end point load. A cantilever beam (same section) 2.0m long with a 1.0kg end point load measure deflections (1 group).

**Prerequisites:** AR4005

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**AR4014 - GRAVITY AND REACTION 4**
ECTS Credits: 3

**School of Architecture**

**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; glulaminated timber; steel; models to describe failure modes in structures. Students will research:

* Materials in the studio and in a site context.
* Materials used in structural design and their relevant components.
* Design and build in model form a bridge with calculated design loads and span.

**Prerequisites:** AR4013

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**AR4016 - GRAVITY AND REACTION 6**
ECTS Credits: 3

**School of Architecture**

**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 will be studied directly in the laboratory 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; glulaminated timber; steel; models to describe failure modes in structures.

Students will research:
(d) Materials in the studio and in a site context.
(e) Materials used in structural design and their relevant components
(f) Design and build in model form a bridge with calculated design loads and span.

Prerequisites: AR4015

AR4022 - REPRESENTATION / DRAWING 2
ECTS Credits: 3

School of Architecture

Rationale and Purpose of the Module:

To establish drawing as a tool of observation, a tool of thinking and a tool of representation, this course consists of three different types of drawing exercises:

1. The idea of transformation introduced in the first semester of the course will be extended to include digital media. Learning how digital media operates and is distinct and different from activities of drawing and model making photoshop and powerpoint will be the first steps into digital representation.

2. Architectural drawing, line drawings of floor plans, sections and details, will become more concrete, will develop from freehand to hard line drawings following the convention of architectural drawing in respect of line types, hatching, representing materials, dimensioning, lettering and grade of detailing depending on scale.

Prerequisites: AR4023

AR4026 - REPRESENTATION / DRAWING 6
ECTS Credits: 3

School of Architecture

Rationale and Purpose of the Module:

In this module students develop skills in 3-dimensional modelling using the computer, in conjunction with continuing studies in physical modelling. Switching between digital and analogue modes of representation, e.g. models, drawings, digital photography, FormZ, Rhino, and SketchUP, 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, 3-dimensional modelling is taught as a tool of spatial investigation and 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 model making skills.

Prerequisites: AR4025

AR4032 - HISTORY AND THEORY OF ARCHITECTURE 2
ECTS Credits: 3

School of Architecture

Rationale and Purpose of the Module:

To expand students' horizons of knowledge about architecture while teaching the foundational skills in reading and writing in the discipline. Even though students at the School of Architecture are expected to be literate and articulate, entering into a new field, such 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 contemporary ways of thinking about the field.

Syllabus:

- Just as students need to learn to describe a site and objectify their reactions to it, as architects it is essential that they also learn to discuss buildings at a high level. Seminars will address Skin, Program, Circulation, Structure, and Codes, introducing both historical and contemporary material to challenge students. Throughout, students will explore architecture's intersection with the material and social realms. As in the first semester, students will undertake close readings of the most significant works in modern and contemporary architecture. Projects likely to be discussed will include Joseph Paxton's Crystal Palace, Otto Wagner's Postparkasse, Mies van der Rohe's 860-880 Lake Shore Drive and Seagram Buildings, Le Corbusier's La Tourette, Eero Saarinen's IBM Headquarters, Bernard Tschumi's Vidy Parc de la Villette, FOA's Yokohama Terminal, MVRDV's WoZoCos Housing Project. Readings by authors such as Robin Evans, Colin Rowe, Anthony Vidler, Otto Wagner, Alan Colquhoun, Le Corbusier, and Walter Gropius will explore the diverse ways by which buildings can be discussed.
- We will visit nearby sites first-hand in order to learn how to read buildings. Afternoon workshops will focus on describing these sites. The writing projects introduced in the fall semester will be built upon in order to ensure that students have a high degree of skill in thinking about architecture through writing by the end of the term.
- This course will be teamed with a series of workshops by Elizabeth Hatz that will introduce students to ways of attaining close readings of buildings through drawing.
**AR4034 - HISTORY AND THEORY OF ARCHITECTURE 4**
ECTS Credits: 3

**School of Architecture**

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. In the second semester 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 second year program revolves around intensive workshops and seminars.

**Syllabus:** Continuing the survey from the first term, the period covered will be from 1945 to the present day, course will survey not simply the history of modern architecture, but the history of environmental, structural, and social systems in such terms. The course is composed of Lectures, seminars, writing workshops, together with research papers.

Prerequisites: AR4033

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**AR4042 - ASSEMBLY AND TECHNIQUES 2**
ECTS Credits: 3

**School of Architecture**

Rationale and Purpose of the Module: Study of building elements and their design origins. Introduction to constructional detail in drawings and models

**Syllabus:** This course will consider the physical realisation of design aspirations through the detailed study of various building elements; structure roof window, entrance etc. This study will be formed by a combination of case study seminars, site visits, as well as the individual students detailed developed of some aspects of their design studio project. The students will be introduced to methods of describing and analysing constructional assembly through drawings and model at scales 1:10 to 1:1.

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**AR4044 - MATERIALS 1**
ECTS Credits: 3

**School of Architecture**

Rationale and Purpose of the Module: The aim is to introduce students to the properties and uses of groups of materials, such as timber, glass, plastics, mineral materials, stone, metals, fabrics, others in architecture, to give students a physical, technological, and analytical basis from which to approach materials in architecture.

**Syllabus:** The content of the course is focused on material research, practical tests, experimentation with built works, and lectures/seminars by renowned individuals. A wide-ranging collection for students/E use and inspiration will be built in the studio, working together to develop a system to show and organize this collection in the studio.

Studio exercises are construction based project work, build a skin for 1m² space out of different materials, one from each group, understanding the characteristics by touching and assembling different materials, analysing the models. There is a lecture series from external architects and artists known for dealing with one specific material, fabrics, wooden constructions.

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**AR4046 - ASSEMBLY AND TECHNIQUES 5**
ECTS Credits: 3

**School of Architecture**

Rationale and Purpose of the Module: The aims of this class are:
¬ to introduce students to making a comprehensive set of working drawings of a third year design studio project.
¬ to develop further the student/E's own intuitive skills in technique alongside knowledge of available construction technology today.
¬ to introduce students to the Irish Building Regulations
¬ to carry out a dissertation on a construction system of personal interest

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

**DRAWING EXERCISE:** Each weekly exercise will concentrate on developing one technical aspect of a building. The culmination of the term will be that each student would have completed a comprehensive set of working drawings.

**LECTURE COURSE:** A weekly lecture will introduce students to developed construction principles, systems and methods. Students will be asked to choose a construction system/method at the start of the year. Each student will complete a short dissertation on the chosen topic for the end of the module.

**DIARY OF A BUILDING:** Students will be assigned a building of appropriate complexity at the start of the year. Fortnightly supervised visits will be made to the building site.
School of Architecture

Rationale and Purpose of the Module: Continuation of first term/ES work, to give students a 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 it's different forms and sources towards materials and their properties. Parallel and interconnected to the teaching of design basics like space, light, backgrounds and properties by handling and personal experiences. ØBurning your finger at a hot stainless steel surface while missing the heat radiation û and understand why this happened - is a much deeper experience, than just calculating heat conductivity on a piece of paper.Ø

Prerequisites: AR4051

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AR4052 - ENVIRONMENTAL SYSTEMS AND FORCES 2
ECTS Credits: 3

School of Architecture

Rationale and Purpose of the Module: Continuation of first term/ES work, to give students a 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 it's different forms and sources towards materials and their properties. Parallel and interconnected to the teaching of design basics like space, light, backgrounds and properties by handling and personal experiences. ØBurning your finger at a hot stainless steel surface while missing the heat radiation û and understand why this happened - is a much deeper experience, than just calculating heat conductivity on a piece of paper.Ø

Prerequisites: AR4051

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AR4054 - ENVIRONMENTAL SYSTEMS AND FORCES 4
ECTS Credits: 3

School of Architecture

Rationale and Purpose of the Module: Development of sustainable principles in design with particular emphasis placed on the house, and achieving balanced solutions in relation to energy and sustainability. Understanding comfort in terms of the cultural and social relations that influence its affect.

Syllabus: Study of all environmental systems required to create a built environment that is in-balance with nature, with particular emphasis placed on the energy and sustainability needs of housing. Students will conduct experiments, research, and learn methods to analyze, design, and text the environmental aspects of the built environment including, U-Values, building envelope integrity tests, daylight tests. Students will construct from actual data (weather data, etc.) models realistic assessments of a buildings environmental performance.

Prerequisites: AR4053

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AR4055 - CULTURE, PLACE AND ENVIRONMENT 1
ECTS Credits: 3

School of Architecture

Rationale and Purpose of the Module: In most cases nowadays, one cannot simply go out and start building. Things must be planned, consents sought, materials organised. The overall architectural project will take time, and will move through a series of modes, and a series of technological, regulatory and economic inputs. The module offers a critique of this Õparts-basedÓ approach, which, it seems, interferes with and determines our capacity to generate spatial, or pictorial, order through a greater understanding of visual world as operated upon by artists, with a particular focus on their means of engagement.

Syllabus: In the history of art and architecture, there are moments when a new order emerges. This module, through an examination of drawings, built work and work practices, traces the links between the emergence of a new order and the practice of the person who brings it into being. This module investigates in some detail the work of several practitioners through time, and as a specific example, will also examine the relationship of three practitioners, the painter Bridget Riley, the sculptor Donald Judd and the architect Kazuyo Sejima, to the progress of their work and situates this in the context of the work of Ludwig Mies van der Rohe.

Prerequisites: AR4032

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AR4058 - PROFESSION AND SOCIETY
ECTS Credits: 3

School of Architecture

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: Architecture students learn best by imagining, developing and realising (full-scale) prototype structures through which ideas can be tested, documented and communicated. Through actual engagement in all the stages of making and building, students have a unique opportunity to develop a rich phenomenal understanding of architecture. Closely related to Design Studio, Advanced Construction informs and supports the students individual design studio projects; directed and independent research on advanced construction is applied to these projects. Students test radical and experimental alternatives to the conventional processes of building because architecture is facing unprecedented pressure to reinvent itself in response to a new set of economic and environmental realities. The responsibility to preempt the needs of future built environments demands new approaches. The modules provide an overview of advanced building construction at an industrial scale and with respect to contemporary, emerging and innovative technologies. Students study the design implications of new construction technologies, and investigate precedents and potential applications.

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AR4068 - ADVANCED CONSTRUCTION 2
ECTS Credits: 3

School of Architecture

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: Architecture students learn best by imagining, developing and realising (full-scale) prototype structures through which ideas can be tested, documented and communicated. Through actual engagement in all the stages of making and building, students have a unique opportunity to develop a rich phenomenal understanding of architecture. Closely related to Design Studio, Advanced Construction informs and supports the students individual design studio projects; directed and independent research on advanced construction is applied to these projects. Students test radical and experimental alternatives to the conventional processes of building because architecture is facing unprecedented pressure to reinvent itself in response to a new set of economic and environmental realities. The responsibility to preempt the needs of future built environments demands new approaches. The modules provide an overview of advanced building construction at an industrial scale and with respect to contemporary, emerging and innovative technologies. Students study the design implications of new construction technologies, and investigate precedents and potential applications.
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. Students undertake a Technical Design Thesis, contextualised as part of a broader dialogue in which the technical and architectural agendas that arise within the year are synthesised. The constructional or technological proposition is pursued critically and developed imaginatively through case studies, material experiments, extensive research and consultation.

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**AW4006 - PEER-TUTORING IN ACADEMIC WRITING**

**ECTS Credits:** 6

**School of Languages, Literature, Culture and Communication**

**Rationale and Purpose of the Module:** This module recognises the centrality of writing in higher education and the importance of writing as a means of learning. Writing fosters metacognitive thinking about writing leading to the development of transferable generic and complex-thinking skills for students in all disciplines, which in turn generates better writers in both academic and professional settings. Better writers, critical thinkers and researchers are better equipped to sustain the knowledge economy. In this context, the module responds to the University/Es ongoing need to create better writers in all disciplines. Peer-tutoring is a step towards providing a coordinated and systematic approach to writing development that is sustainable and cost effective as it will produce a cohort of fully trained, confident graduate and postgraduate student-tutors from a wide variety of disciplines.

**Syllabus:** Students will develop an awareness and command of the metalanguage to discuss their own writing process. This will be developed through reflecting on existing and past writing assignments. Through small group discussion and writing-focused workshops, students will be engaged in activities to develop themselves as writers and writing tutors, including critical and reflective evaluation of their own writing; familiarity with the conventions honoured and the criteria used by other disciplines for the evaluation of writing therein; development of tutoring strategies; observations of experienced peer-tutors; engagement in regular peer-tutoring activity; managing diverse tutoring situations; and professional development. Students will read, write and talk about argumentation, arrangement of ideas, coherence, discipline-specific style conventions and values, grammar, and ethical concerns.

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**BC4002 - INTRODUCTORY BIOCHEMISTRY**

**ECTS Credits:** 6

**Chemical & Environmental Sciences**

**Rationale and Purpose of the Module:** To provide an understanding of the structure and function of the major biological molecules

* To provide an understanding of the principles of metabolism

* To provide an understanding of the biochemistry of blood and basic immunology


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**BC4008 - IMMUNO AND DNA DIAGNOSTIC TECHNIQUES**

**ECTS Credits:** 6

**Chemical & Environmental Sciences**

**Rationale and Purpose of the Module:** To provide an overview of the immune system, structure and function of antibodies and usage of Immune and DNA diagnostics.


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**BC4718 - INDUSTRIAL BIOCHEMISTRY 2**

**ECTS Credits:** 6

**Chemical & Environmental Sciences**

**Rationale and Purpose of the Module:** To present an overview of (a) animal cell culture and (b) pharmaceutical biotechnology in the context of underlining science and industrial/medical applications.

To present an overview of patenting as applied to biotechnology.

To provide the scope for a measure of student self-directed learning and problem-based learning.
**Syllabus:** Animal cell culture; Overview and introduction to animal cell culture. Animal cell culture, media, methods and apparatus. Animal cell culture; production of industrially useful products. The drug development process; Regulatory route for new drugs in USA & EU. Biopharmaceutical manufacture; Patenting and biotechnology. Principles of patentability. The patent application process. Sources of biopharmaceuticals. Upstream processing. Downstream processing. Post translational modifications and their significance. Product QC and the range and significance of potential product impurities. Nucleic acid-based biopharmaceuticals; The theory underpinning gene therapy, antisense based products and aptamers. Specific biopharmaceuticals; Students will be provided with 2-3 specific biopharmaceutical products/product families, along with bibliographic details of at least 1 reference source material for each. Students will be expected to source the references, along with any additional pertinent references and undertake self-directed study of the biochemistry and biotechnology of the representative biopharmaceuticals.

**Prerequisites:** BC4904, BC4905, BC4903

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**BC4904 - PROTEINS AND DNA**

ECTS Credits: 6

**Chemical & Environmental Sciences**

**Rationale and Purpose of the Module:** To develop themes in protein chemistry and enzymology. To develop a fundamental understanding of enzyme kinetics, catalysis and purification. To understand the relationship between nucleic acids and proteins leading to gene structure and expression. To back these concepts up with practical skills.


**Prerequisites:** BC4903

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**BC4938 - DIAGNOSTIC TECHNIQUES**

ECTS Credits: 6

**Chemical & Environmental Sciences**

**Rationale and Purpose of the Module:** To familiarise the student with established and novel developments in the field of nucleic acid-based diagnostics and therapeutics.

To develop the students’ awareness of laboratory techniques specific to immunology.

To familiarise the student with biomolecules which have clinical significance as disease markers.

**Syllabus:** Identifying unknown bacteria: traditional methods vs. 16S rRNA sequencing. [Nucleic acid diagnostics]: amplification-based ? PCR, PCR variants, real-time PCR; hybridisation-based ? southern blotting, in situ hybridisation, FISH, DNA microarrays; uses of polymorphisms in RFLP, RAPD and DNA fingerprinting. [Nucleic acid therapeutics]: gene silencing ? antisense therapy and RNA interference. [Proteomics]: 2D PAGE, mass spectrometry. [Immunodiagnostics]: antibody production and purification; western blotting; radioimmunoassay; ELISA ? setup, methodology. [Disease markers]: clinically important enzymes; tumour markers. [Biosensors]: biological elements; transducers.

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**BY4002 - BIOLOGY 2**

ECTS Credits: 6

**Life Sciences**

**Rationale and Purpose of the Module:** The purpose of this module is to introduce students to fundamental concepts in cellular reproduction and genetics; diversity of life, introductory plant physiology, evolution and ecological principles.

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**BY4004 - HORTICULTURE**

ECTS Credits: 3

**Life Sciences**

Composts, growing media and substrates in horticulture, seed propagation, vegetative propagation, seedbed preparation, horticultural crop rotation, vegetable crop production & fertilising, climatic factors associated with plant growth, micropropagation & genetic modification of plants.

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**BY4008 - GENETICS AND MOLECULAR BIOLOGY**

ECTS Credits: 6

**Life Sciences**

**Rationale and Purpose of the Module:** The purpose of this module is to give students an understanding of the mechanisms underlying genetic inheritance at organism, gene and molecular levels in the light of current knowledge. It is also designed to equip the students, most of whom will be aspiring second -year teachers of biology, the necessary skill and knowledge to able to
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, BY4006

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**BY4104 - ECOLOGY 1**
ECTS Credits: 6

Life Sciences

Freshwater ecosystems: lentic and lotic habitats, plant and animal life; physico chemical and other abiotic influences in freshwater ecosystems Marine ecosystems, concentrating on the ecology of rocky shores; brief consideration of sandy, muddy and estuarine ecosystems; plant and animal life and the influence of physico chemical and other abiotic factors intrinsic to these ecosystems. General introduction to plant and vegetation ecology, plant communities in Ireland. Woodland ecosystems: structure, composition, succession. Adaptations of woodland plants and animals. Population dynamics and ecological strategies of woodland plants. Food webs, primary and secondary productivity in these ecosystems. Detritus and grazing food chains. Detritivores in woodlands; fungi and their role in woodlands. Introduction to vegetation sampling.

Prerequisites: BY4001, BY4002, BY4003

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**BY4208 - AGRICULTURE 2**
ECTS Credits: 6

**Life Sciences**

**Rationale and Purpose of the Module:** The purpose of the module is to educate the students in animal production, health and welfare so that they are able to teach it as part of agricultural science at leaving certificate level

**Syllabus:** Animal production; Health and welfare; Ruminant nutrition and growth; Feedstuffs; Food evaluation and feeding standards; Anatomy, physiology and control of mammalian reproduction; Sheep production; Beef production; Dairy herd management; Dairy science, anatomy, physiology and control of lactation; Pig and poultry production.

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**BY4214 - PRINCIPLES OF HUMAN NUTRITION**
ECTS Credits: 6

**Life Sciences**

**Rationale and Purpose of the Module:** To introduce students to the basic concepts and principles of Human Nutrition

**Syllabus:** This module will examine nutrients, their function, metabolism and food sources as well as discuss the latest research in the role of nutrition for the promotion of optimal health and prevention of disease. The absorption, digestion and essential functions of the macronutrients (carbohydrate, protein and lipids) and the micronutrients (vitamins and minerals) will be explored. Changes in nutritional requirements at different stages of the life cycle will discussed as well as special needs during pregnancy, lactation and aging. The impact of nutrition and food on the promotion of health and the prevention of disease will be fully explored. Topics covered include: energy requirements, carbohydrates, protein, lipids, absorption, digestion and metabolism of nutrients, vitamins, minerals, water, dietary standards, heart disease, cancer, obesity, maternal nutrition/lactation, infant/childhood/teenage nutrition

Prerequisites: BY4001, BY4002, CH4102

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**BY4505 - POLLUTION BIOLOGY**
ECTS Credits: 6

**Life Sciences**

**Rationale and Purpose of the Module:** To familiarise students with the main types of environmental pollutants, their origins, exposure routes and impacts. To equip students with skills in the methodology monitoring the impacts of selected pollutants.

**Syllabus:** Categories of freshwater pollution. Organic pollution of surface and ground water - sources, effects and impacts. Indicators - biological and chemical monitoring; use of biotic indices. Methods for determination of nitrates, phosphorus, chlorophyll a, Ca, Mg, D.O., B.O.D., C.O.D., T.O.C., etc. Microbial pollution - methods.
Prerequisites: BY4003

CE4002 - ENGINEERING MECHANICS
ECTS Credits: 6

Civil Engineering and Materials Science

Rationale and Purpose of the Module: To provide the student with a foundation in the theory and principles of statics and dynamics. Throughout the course emphasis is placed on the development of sound problem-solving techniques and logical interpretation of results. Application to realistic engineering problems is stressed through the use of examples, demonstrations, and assessment problems.

Syllabus: Load paths through structures under vertical gravity load; horizontal loads from wind / stability. Methods of providing lateral stability: shear walls, cores, frames, strut / x-bracing; Field trip to significant building / structure to investigate sketch load paths in-situ; Structural form: funicular shapes applied to cables and arches; Bending moment and shear force diagrams under point and uniform loads, for simply supported and fixed end beams; Member forces in pin-jointed trusses; Introduction to structural dynamics / resonance; Introduction to relationship between bending moment / elastic modulus / bending stress; Design, develop and construct small structure to carry 150g load, including trial models and associated calculations to determine main member forces; Develop research methods and resources.

Further experience of design as an iterative and creative process subject to constraints; Synthesis of ideas from strength of materials, Assembly and Technology and Drawing and Representation in a design task; Assignments will typically involve prototype or model construction, as well as material or component testing; Presentation for critique of research results and proposals.

CE4004 - MECHANICS OF SOLIDS
ECTS Credits: 3

Civil Engineering and Materials Science

Rationale and Purpose of the Module: Aims and Objectives
* To provide a foundation for analysing structures.
* To provide the foundations for analysing stress and strain.

**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:**
- Manufacture and composition û a review, section
- 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 û run-off, unit, synthetic; Channel Storage; Mass diagrams; Routing û 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 û 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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**CE4024 - STRUCTURAL STEEL AND TIMBER DESIGN**

ECTS Credits: 6

**Civil Engineering and Materials Science**

**Rationale and Purpose of the Module:** This module introduces the student to the structural design and detailing of elements in steel and timber with the following key objectives:

- To master the concepts of structural design in steel and timber.
- To develop the skill of detailing structural connections in steel and timber.
- To develop an awareness of the structural uses and limitations of steel and timber.

**Syllabus:**
- Structural Steel
- Manufacture and composition û a review, section
- Properties tables, design of fully restrained, partially restrained and un-restrained beams, truss design, design of long and short columns; axial and combined loading conditions, design of pinned and moment connections, baseplate and splice design, structural detailing and fire & durability issues.
- Timber Design
- Properties and conversion of timber û a review, beam design, column design; axial and combined loading conditions, truss design and stability issues, Introduction to diaphragm & shearwall design, bolted, nailed and stapled connections, glulam, LVL and I-beam design, structural detailing and fire & durability issues.

**Prerequisites:** CE4002

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**CE4025 - TRANSPORT PLANNING AND DESIGN**

ECTS Credits: 6

**Civil Engineering and Materials Science**

**Rationale and Purpose of the Module:** This module places transport in its wider historical and contemporary context as a major determinant of sustainable human settlement. It addresses current thinking and trends and introduces the main methods of data collection and analysis, transport system planning, appraisal, design and management.

**Syllabus:**
- History and Contemporary Picture and Trends: Physical, social, political and economic contexts, sustainable transport and settlement, current policies and trends.
- Data Collection and Analysis: Use of demographic data, survey design and implementation.
- Appraisal and Forecasting: Demand drivers, mode choice and behaviour, an overview of multi-modal macro and micro modelling, modelling uses and limitations, demand and capacity forecasting, impact assessment.
- Road Design: Road construction details and geometric guidelines, road junction analysis.

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**CE4028 - ENERGY EFFICIENT BUILDINGS: MODELLING AND DESIGN**

ECTS Credits: 6

**Civil Engineering and Materials Science**

**Rationale and Purpose of the Module:** Building energy design is now a primary driver of overall building design. Understanding building energy physics is now essential for all design team members. Aims and objectives: Train students how to design and model energy-efficient buildings; Equip students with the knowledge required to quantify the energy-efficiency of preliminary designs and propose building and material design modifications; predict thermal performance within building zones; understand how building design, occupancy and use interacts with thermal energy systems, solar irradiance and weather conditions as well as their effect on human comfort and energy consumption.

**Syllabus:**
- Building design and energy use: historical trends, current status and future trends Building energy policy at national and EU level; factors affecting human comfort; Steady-state and transient thermal physics of buildings; heat transfer mechanisms; performance metrics; typical metric values for building including exemplar low-energy and passive builds; design related and environmental performance drivers (overall form, aspect ratio, surface-to-volume ratio, percentage glazing, orientation, site context, solar irradiance, prevailing winds, shelter, design features including insulation, solar shading, low-e coatings, automated shading and ventilation.
- Overview of strategies for modelling building thermal physics; thermal resistance networks; lumped capacitance; steady-state vs. transient; dimensionless scaling parameters and empirical correlations; compiling input data - building fabric, thermal mass, weather data, building use, active, passive and mixed mode ventilation, thermal sources, heating & cooling systems, control strategies and feedback.
- Design thermal model, build and digitise model, configure inputs, configure outputs, solve and interpret outputs; describe scope and limitations of model; suggest modifications to enhance energy usage, update model, analyse response and appreciate cost benefit of improvements.

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**CE4034 - BUILDING ENERGY SYSTEMS**

ECTS Credits: 3

**Civil Engineering and Materials Science**

**Rationale and Purpose of the Module:** This module uses the Dwelling Energy Assessment Procedure (DEAP) as a framework for introducing the fundamentals of building environmental and energy systems so that the
learning outcomes are realised:


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CE4068 - PROCUREMENT AND CONTRACTING II ECTS Credits: 6

Civil Engineering and Materials Science

Rationale and Purpose of the Module: This module builds on the construction contracting and procurement topics provided in Procurement and Contracting 1 and further develops the procurement and contracting fundamentals as they apply to the various aspects of the construction industry; including civil, structural, mechanical, electrical and plant elements. In particular the causes and remedies for construction disputes are covered such that the following key objectives are met:

To become familiar with the relevant terminology as it applies to the construction industry.

To develop a strong understanding of the standard forms of construction contracts in use in the industry, both domestically and internationally and making specific reference to the work carried out under the aegis of the various multilateral development banks.

Create an understanding of the role of the construction manager as an agent for the prevention and successful management of disputes.

Develop an ability within aspiring construction managers to appreciate and take full account of the ramifications of their, and other parties', actions in the context of successfully leading and managing complex construction projects.

To reflect the role of ethics in professional practice.

Syllabus: Construction contracts: formation, tendering, conditions, standard forms; areas of dispute and liability; certification process; claims and the importance of the programme in the management of time-related claims; dispute resolution: traditional forms, dispute boards, adjudication, alternative dispute resolution; design liability of professionals and contractors.

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CE4206 - OPERATING SYSTEMS 2 ECTS Credits: 6

Electronics & Computer Engineering

Rationale and Purpose of the Module: Study of multitasking operating systems. Study will be confined to single processor systems. A Unix or WIN-32 operating system will be selected as the prime example operating system. The module lab work will teach the student to develop concurrent program solutions. The module includes: concurrency, states, queues, scheduling. Process inter-communication. Memory management. File systems to support multitasking, File sharing, file protection, performance issues. Conditions for deadlock and solutions. I/O devices and device drivers. File security and protection.

Syllabus: 1) Processes: Concurrency, states, queues, scheduling. 2) Process Communication: Mutual exclusion, race conditions, busy-waiting solutions, Test/Set locks, semaphores, monitors, simple message passing, pipes, classical problems. 3) Memory Management: Swapping, virtual memory, paging, segmentation, performance and protection issues. 4) File systems to support multitasking: File sharing, file protection, performance issues. The UNIX i-node system. 5) Deadlock: Conditions for deadlock and solutions. 6) Input/Output: I/O Devices for multitasking environments, need for design of re-entrant drivers. 7) Computer Security and Protection: User authentication; protection matrix; ACL; capabilities. 8) Case Study: The UNIX Operating System: Origins; Standards; Shells; Utilities; Process Management; Memory Management; File Management; Programming in the Unix environment (Or, equivalent study based on a WIN-32 operating system.)

Prerequisites: CE4204

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CE4208 - DISTRIBUTED SYSTEMS ECTS Credits: 6

Electronics & 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.

Syllabus: To introduces application design principles and techniques using available web-based technologies, (e.g SOAP, Microsoft.NET, Java Services). Reliability and security issues of distributed applications are addressed. Use of cookies and the covert use of applications to provide a community-wide service.

Characterization of Distributed Systems. Tools and technologies used to develop distributed applications. Mechanisms to secure applications from malicious attacks and errant processes. Component based software development (e.g. CORBA, JavaBeans). Service portability via virtual servers. Replication and Fault Tolerance. Study of evolving Web services. The role of the hidden internet for intelligence gathering. Remotely hosted application environments.

Prerequisites: CE4607, CE4206

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CE4518 - COMPUTER ARCHITECTURE ECTS Credits: 6

Electronics & Computer Engineering

Rationale and Purpose of the Module: To provide a grounding in the analytic study of computer architecture and an introduction to various architectural styles, e.g., CISC, RISC, and various von Neumann architectures.

Handling exceptions.
Pipelining: Hazards in pipelines. CISC and RISC pipelines. Multicycle pipelines (superpipelining).

Prerequisites: CE4517

CE4706 - SOFTWARE ENGINEERING 1
ECTS Credits: 6

Electronics & Computer Engineering
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

Syllabus: Introduction to Software Engineering.
Software Development Paradigms.
Software Evolution and Reliability.
Human Factors in Software Engineering.
Software Specification, System Modelling.
Requirements Definition/Specification.
Software Design: Modularity, Cohesion, Coupling.
Function Oriented Design.
Diagramming Techniques.
Structured Design.
Software Reviewing and Testing.
Software Quality Assurance and metrics.
More ADTs and algorithms.
Introduction to Object Oriented Analysis/Design and Programming.
Programming Languages Programming Practice: Coding, Style, Documentation.
Individual and Team Project/Case Study.

Prerequisites: CE4704

CE4708 - ARTIFICIAL INTELLIGENCE
ECTS Credits: 6

Electronics & 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: CE4703

CE4717 - LANGUAGE PROCESSORS
ECTS Credits: 6

Electronics & Computer Engineering
Rationale and Purpose of the Module: To introduce the theory of compiler design and show its application in a simple compiler. An important part of the module is the implementation of a compiler for a simple, Pascal-like, language.

Scanning: Regular expressions. State machine implementation. Nondeterministic automata and translation to deterministic automata. The use of a scanner generator such as LEX.

Table-driven parsing techniques: LL(*) table-driven parsers. Shift-reduce parsers. LR parsing. The LR(0) Characteristic Finite State Machine. LR(1), SLR, LALR(1). The use of a parser generator such as yacc.

Code generation for register architectures. Introduction to code optimisation techniques.

Prerequisites: CE4703

CG4008 - PROCESS TROUBLESHOOTING
ECTS Credits: 6

Chemical & Environmental Sciences

Rationale and Purpose of the Module: To provide the student with skills and knowledge in the field of chemical and biochemical process troubleshooting.

Syllabus: Characteristics of trouble shooting problems and the methodologies used to solve them. Approaches to the analysis and formulation of solutions to process issues.

Data gathering and critical thinking techniques. The use of interpersonal communication skills in handling management issues associated with industrial process problems.

Practical methodologies: recognising patterns, cause-effect, reasoning, and selection of valid diagnostic actions; process trouble shooting rules of thumb; formulation of realistic solutions to process problems.

Selected process trouble shooting case studies in the chemical and biochemical industries.

Process trouble shooting simulation lab.

Rationale and Purpose of the Module: i. To facilitate the student in understanding of the fundamental thermodynamic laws and its qualitative and quantitative applications to chemical systems

ii. To familiarise the students with the energy terms and relations that applicable to chemical thermodynamic systems

iii. To introduce the students to the basic chemical kinetics including the quantitative expressing of the rate of chemical reactions and key kinetic parameters in the chemical kinetics

Syllabus: Introduction to Chemical Thermodynamics; Heat; Work; Reversible and Irreversible Systems; State functions.

First Law of Thermodynamics; Internal Energy; Enthalpy; Standard Enthalpies.

Second and Third Laws of Thermodynamics; Entropy, Clausius Inequality; Gibbs and Helmholtz Free Energies.

Chemical Equilibrium; variations with temperature and pressure.

Introduction to Chemical kinetics; Zero, First and Second Order Rate Laws. Activation Energy and the Arrhenius Equation; Accounting for the Rate Laws; Reaction Mechanisms; Steady State Approximation. Michaelis-Menten equation]

CH4004 - PHYSICAL CHEMISTRY 3
ECTS Credits: 6

Chemical & Environmental Sciences

Rationale and Purpose of the Module: i. To facilitate students in understanding the fundamental thermodynamic laws and functions that rule a process of change in a physical chemical system.

ii. To provide students with requisite knowledge of analysing physical chemical systems, such as the phase transformation of a pure substance, the mixing and phase transformation of two components, using thermodynamic and derived thermodynamic functions.

iii. To familiarise the students with the phase diagrams and the use of these to analyse the above-mentioned physical chemical system.

iv. To provide the students with basic knowledge of electrochemistry, electrochemical cell and their thermodynamic account.

Syllabus: 1st Law of Thermodynamics; Enthalpy - Entropy; 2nd and 3rd Laws of Thermodynamics; Clausius Inequality - Helmholtz and Gibbs Energies

- Chemical Potential; Fundamental Equation of Chemical Thermodynamics
- Physical Transformations of Pure Substances: Phase Diagrams; Phase Stability and Phase Transitions; The Physics of Liquid Surface
- Simple Mixtures: Gibbs-Duhem equation; Raoult/Es and Henry/Es Laws
- Phase Diagrams: Phase Rule; Two-Component Systems - Equilibrium Electrochemistry: Thermodynamic Properties of Ions in Solution; Electrochemical Cells; Nernst Equation

Prerequisites: CH4003, CH4002

CH4008 - ORGANIC PHARMACEUTICAL CHEMISTRY 2
ECTS Credits: 6

Chemical & Environmental Sciences

Rationale and Purpose of the Module: To build on the functional group chemistry covered in CH4102, CH4103, CH4104 and CH4007. To extend the studentsÆ comprehension and working knowledge of functional group chemistry; to expand the range of reagents, reactions and associated mechanisms; to detail how structure and reactivity can be quantitatively correlated; to detail quantitative aspects of acid and base catalysis.

Syllabus: Section A: Regiochemical control: addition of HBr by ionic and radical mechanisms, alcohol formation by acid catalysed hydration and via hydroboration; Chemoselective control: Lindlars catalyst and dissolving metal reduction; hydride reducing reagents, Reformatsky reaction; use of protecting groups. Stereoselective control: asymmetric induction, diastereomeric selectivity, Felkin-Anh model; enantionemic selectivity, chiral hydride reagents (Alpine Borane and Alpine Borohydrides), chiral catalysts -Monsanto catalyst for L-Dopa production.

Section B: Quantitative structure activity relationships: development and use of the Hammett equation; definition of general and specific acid and base catalysis, use of buffers and kinetic data to distinguish between general and specific catalysis, quantitative analysis of data.

Named (and other) Reactions: Oral presentation by students on reactions such as Hydroboration, Reformatsky, Dihydroxylation, Mannich Reaction, Reductive Amination, Birch Reduction, Michael Addition, Allylic bromination, Sharpless Epoxidation, Mitsunobu Reaction, Suzuki Coupling, Heck Reaction, Benzyne chemistry.
CH4012 - GENERAL CHEMISTRY 2
ECTS Credits: 6

Chemical & Environmental Sciences

Rationale and Purpose of the Module: To introduce students to the general principles of energetics, electrochemistry, kinetics and structure, building on what they have done in General Chemistry 1.

Syllabus: Energetics: Enthalpy, entropy and free energy; first two laws of thermodynamics; thermochemistry; equilibrium constants and free energy. Electrochemistry: Free energy and cell potential; emf cells and the Nernst equation; electrochemical series; electrolysis cells and Faraday\'s laws; batteries and fuel cells. Kinetics: Rate equation, rate laws and orders of reaction; factors affecting the rate of reaction; activation energy and reaction profile; Arrhenius equation; catalysts. Structure and bonding: Types of chemical bonding, classification of solids and properties. Bonding in relation to the Periodic table. a) molecular compounds: Lewis structures, VSEPR and molecular shape, polarity; nature of the covalent bond, types of covalent bond - sigma and pi, single, double and triple. b) ionic compounds: nature of the ionic bond; unit cells; lattice energy; factors affecting the strength of ionic bonds. Solubility: Factors affecting the solubility of molecular and ionic compounds - energetics, kinetics and structure.

Prerequisites: CH4008

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CH4054 - PHYSICAL CHEMISTRY
ECTS Credits: 6

Chemical & Environmental Sciences

Rationale and Purpose of the Module: To teach key principles of physical chemistry. To carry out practical work to support and reinforce some of the theoretical aspects encountered.

Syllabus: Thermodynamics, heat, work, reversible and irreversible systems, state functions; First law of thermodynamics, internal energy, enthalpy, standard enthalpies, second law of thermodynamics, entropy, Gibbs free energies, Chemical equilibrium; effect of temperature, pressure, concentration, Le Chateliers Principle; Ions in aqueous solution; electrochemical cells, electrolytic conductivity, Reaction kinetics: zero, first and second order reactions and enzyme kinetics-Michaelis-Menten.

Prerequisites: CH4102

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CH4017 - CHEMICAL NANOTECHNOLOGY
ECTS Credits: 6

Chemical & Environmental Sciences

Rationale and Purpose of the Module: The Chemical Nanotechnology module will provide the student with a broad understanding of the principles that underpin nanoscience and nanotechnology.

•To acquaint the student with synthetic methods for formation of nanostructures and new physical properties that arise.

•To enable the student to solve problems relating to size dependent physical, optical and electrical properties at the nanoscale.

Syllabus: Course will cover: (1) Chemical and physical properties as length scales vary from the macroscale through microscale to the nanoscale. (2) Chemical synthesis and modification including 0D, 1D and 3D incorporating 1-7 colloidal nanocrystals. Study of carbon nanotubes, wrapping vectors, tensile strength and electronic properties (3) Kinetics of nanocrystal growth and the organic/inorganic interface. (4) Chemical functionalisation of inorganic nanostructures with organic molecules and the bio/nano interface (5) Industrial applications of nanochemistry, nanosizing of pharmaceuticals etc. (7). Introduction to crystal engineering with emphasis upon the following subjects: Supramolecular chemistry, especially hydrogen bonding Types of crystalline solids and their characterization (8) Pharmaceutical materials especially multi-component crystals (cocrystals) - (9) Coordination polymers especially porous metal-organic materials.

Prerequisites: CH4701

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CH4104 - ORGANIC CHEMISTRY 3
ECTS Credits: 6

Chemical & Environmental Sciences

Rationale and Purpose of the Module: To build on and extend the foundation chemistry covered in CH4102 and CH4103; to highlight heterocyclic chemistry as a key part of this extension; to develop the associated chemistry, reactions, biological importance of various heterocyclic compounds; to give the student a basic working knowledge and comprehension of the biomolecules ū aminoacids, peptides and carbohydrates; to carry out practical work to support and reinforce some of the theoretical aspects encountered.

Syllabus: Protein Chemistry:
Amino Acids: structure; synthesis and resolution; stereochemistry; isoelectric point; preparation from a-haloaminoacids; Gabriel Synthesis; Strecker Synthesis. Peptides: Sequence determination: N and C terminal analysis; strategy for synthesis, use of protecting groups and activating agents, solid state synthesis using Merrifield resin.

Carbohydrate Chemistry:
Monosaccharides: aldoses and ketoses; structure and stereochemistry; hemiacetal and hemiketal formation; Fischer Projections, Haworth representation, chair conformation; oxidation and reduction reactions. Disaccharides: Glycosides (sugars as acetals and ketals); structure; reducing and non-reducing disaccharides. Polysaccharides: structure and occurrence.

Heterocyclic Chemistry:
5-Membered ring aromatic heterocycles: structure, aromaticity; electrophilic aromatic substitution reactions—reactivity and orientation; 5-membered ring non-aromatic heterocycles: structure and synthesis. Basicity of aromatic /non-aromatic N-heterocycles.
6-membered ring aromatic and non-aromatic N-heterocycles: Structure, properties; electrophilic and nucleophilic aromatic substitution reactions of pyridine; reactivity and orientation; basicity. Azoles and Fused 5-membered ring aromatic heterocycles; Structure, basicity (where relevant); Azines. Nucleic acids. Occurrence/application of all types of heterocycles encountered above. Current trends.

Prerequisites: CH4103, CH4102

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CH4152 - INTRODUCTORY ORGANIC CHEMISTRY 1B
ECTS Credits: 6

Chemical & Environmental Sciences

Rationale and Purpose of the Module: To introduce students to the importance of structure and bonding in determining the properties of substances, and to consider the bonding in molecules and in solids, particularly ionic solids.


Prerequisites: CH4701

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CH4252 - INORGANIC CHEMISTRY 1B
ECTS Credits: 6

Chemical & Environmental Sciences

Rationale and Purpose of the Module: To introduce students to the importance of structure and bonding in determining the properties of substances, and to consider the bonding in molecules and in solids, particularly ionic solids.


Prerequisites: CH4701

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CH4202 - INORGANIC CHEMISTRY 1
ECTS Credits: 6

Chemical & Environmental Sciences

Rationale and Purpose of the Module: To introduce students to the importance of structure and bonding in determining the properties of substances, and to consider the bonding in molecules and in solids,

Prerequisites: CH4701

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CH4304 - ANALYTICAL CHEMISTRY 2
ECTS Credits: 6

Chemical & Environmental Sciences
Rationale and Purpose of the Module: To provide students with an understanding of some key elements of the theory of separation science and their application to analytical techniques

Syllabus: Introduction to separation science
Solvent extraction. Countercurrent extraction. Introduction to chromatography, modes of separation. Gas Chromatography. Liquid Chromatography. HPLC, Ion Chromatography, Size exclusion chromatography
Mass Spectrometry
Hypenated techniques, GC-MS HPLC-MS

Prerequisites: CH4303

CH4306 - ANALYTICAL CHEMISTRY 4
ECTS Credits: 6

Chemical & Environmental Sciences

Rationale and Purpose of the Module: To review and extend the student's existing knowledge and comprehension of fundamental spectroscopic techniques encountered in CH4303, CH4304 and CH4305; to provide the student with an in-depth working knowledge and comprehension of various advanced spectroscopic techniques; to emphasise the interpretation of spectral data in an integrated manner through the use of combined spectroscopic techniques; to highlight various applications of the techniques encountered; to encourage self-directed learning through the use of some recommended websites and software.

Syllabus: Mass Spectrometry: Brief review of some basic principals; Fragmentation Patterns; Rearrangements; Interpretation of spectra; Hyphenated techniques.
NMR Spectroscopy: 1-D 1H NMR: Review of some basic principals; Relaxation Processes; Hometopic, enantiotopic and diastereotopic systems; Nuclear Overhauser Effect (NOE); Second-Order Spectral Interpretation. 13C NMR: Theory; DEPT 13CnMr; NOE, Quantitative13CnMr; Interpretation of spectra. Solid State 13C nmr (brief). 2-D 1HNMR: COSY (1H-1H connectivity); NOESY, ROESY (through space 1H-1H proximity), HOSEY; HECTOR (1H - 13C connectivity); INADEQUATE (13C - 13C connectivity); TOCSY (1D and 2D); Interpretation of spectra.
Structure elucidation using combined spectroscopic techniques (of those above).
Laser Raman Spectroscopy: Theory; Comparison with FT-IR spectroscopy; Spectral interpretation of simple organic molecules and carbon allotropes (diamond, graphite and carbon nanotubes).
Problem Sessions/Lab.
Prerequisites: CH4305, CH4304, CH4303

CH4354 - ANALYTICAL CHEMISTRY FOR THE ENVIRONMENT
ECTS Credits: 6

Chemical & Environmental Sciences

Rationale and Purpose of the Module: * To convey that spectroscopy (the interaction of light with matter) provides both a qualitative and quantitative method to determine molecular/atomic structure and concentration
* To introduce analytic instruments and instrumental techniques

Syllabus: SYLLABUS
SPECTROSCOPIC METHODS:
AAS ATOMIC ABSORPTION SPECTROSCOPY
AES ATOMIC EMISSION SPECTROSCOPY
UV/VIS ULTRA-VIOLET/VISIBLE SPECTROSCOPY
IR INFRARED SPECTROSCOPY (& FTIR)

CHROMATOGRAPHIC METHODS:
PARTITION (GLC, HPLC, TLC)
ABSORPTION (GC)
ION-EXCHANGE
SIZE EXCLUSION (GEL PERMEATION)

ELECTROMETRIC METHODS:
POTENTIOMETRIC (PH, ISE)
CONDUCTOMETRIC

CH4404 - PROCESS TECHNOLOGY 1
ECTS Credits: 6

Chemical & Environmental Sciences

Rationale and Purpose of the Module: To introduce students to important aspects of safety, process control, and process modelling in chemical and biochemical processing systems.

Introduction to process control: basic control modes e.g. P, PI, PID; control system architecture and dynamic behaviour for SISO processes; controller tuning; control system hierarchies for chemical/biochemical processing plants.
Equipment and instrumentation used in chemical and biochemical processing operations: sensing and measurement; signal transmission; controllers; final control elements.
Process modelling; application of material and energy balances in the formulation of quantitative process models; process characteristics and dynamic response behaviour of first and second order systems.

CH4554 - ENVIRONMENTAL CHEMISTRY
ECTS Credits: 6

Chemical & Environmental Sciences

Rationale and Purpose of the Module: To provide a basis of understanding the chemical processes occurring in the environment, with particular reference to biogeochemical cycles and the chemical ideas underlying environmental problems.

Syllabus: Chemistry of the earth: overall structure, composition, energy flow, inter-relation of the different spheres. Definitions. Concentrations. The hydrosphere: composition; the water cycle; equilibria in aqueous systems, distribution diagrams; water pollution. The lithosphere: composition and structure; weathering; leaching and soil chemistry; mineral resources and pollution; geochemistry; solubility, pH; E-pH diagrams. The atmosphere: composition, chemical processes in the atmosphere, solubility in water; chemistry of acid deposition, greenhouse effect, ozone depletion,
photochemical smog.
The biosphere: composition, major and minor elements; sources, utilisation and disposal; toxicology of heavy metals and organics, bioaccumulation.
Biogeochemical cycles for nitrogen, carbon, sulphur, phosphorus, etc

Prerequisites: CH4253, CH4252, CH4701

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**CH4608 - PLANT AND PROCESS MANAGEMENT 2**
**ECTS Credits: 6**

**Chemical & Environmental Sciences**

**Rationale and Purpose of the Module:** To provide the student with an understanding of a number of key topics in the management of chemical and biochemical processing operations.

**Syllabus:** Methodologies for the identification, assessment, and control of risks and hazards associated with processing operations, including HAZOP analysis.

Costing of chemical & biochemical plants; stages of costing, methods of cost prediction, exponential, factorial etc. Cost updating. Economic evaluation of chemical and biochemical processing projects; pay-back, ROI, NPV, etc. Sensitivity analysis.

Plant location and layout: principles and application.

Environmental impact assessment of chemical and biochemical production facilities.

Industrial sustainability: concepts and practice. Case study of the application of sustainability metrics to chemical and biochemical processing plants.

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**CH4401 - SCI FDN 1, CHEM, BIOCHEM AND PHYS FOR NURSING AND MIDWIFERY**
**ECTS Credits: 3**

**Chemical & Environmental 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

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**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.

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**CS4005 - PERCEPTUAL SYSTEMS AND MULTIMEDIA**
**ECTS Credits: 6**

**Computer Science & Information Systems**

**Rationale and Purpose of the Module:** Creating an awareness and understand how our senses work in order to perceive the world around us.

**Syllabus:** Fundamentals of physical dimensions used by human sensation and perception - light, sound, heat, pressure;
Fundamentals of the senses of hearing, seeing and touch: physiology and function;
Psychophysical measures and correlates of perception;
Introduction to Signal Detection Theory;
Theories of perception, perceptual organisation, attention, object recognition, depth perception and motion perception;
Navigation and Spatial Cognition; Multimodal integration;
Memory and training: introduction to theories of mind and their relationship to theories of mediation, communication and perception.
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.

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.

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CS4014 - SOFTWARE DEVELOPMENT PROJECT
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: A substantial semester-long software development project is set. Students, working in teams, produce a complete implementation. A partially specified project is presented. Students complete the requirements and then take the project through the design, coding and testing stages. The language and technology of implementation depends on the type of project specified but will generally allow students as much free choice as possible. (Lectures and labs will run from weeks 1 to 5 inclusive). These along with tutorials during this period will build on existing modelling, design and programming skills required to achieve the proposed system.

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CS4022 - DIGITAL INSTRUMENT FUNDAMENTALS
ECTS Credits: 6

Computer Science & Information Systems

Rationale and Purpose of the Module: To provide the student with an understanding of music fundamentals, instrument design and basic notation skills and to introduce concepts of music software sequencing and its underlying protocols and technologies.

Syllabus: Music notation, traditional instrument design and electronic music interfaces; Understanding notation, rhythm, time signatures, key signatures, dynamics and articulation; The development of cross platform hybrid music interfaces and the establishment of digital instrument protocols.

Prerequisites: CS4032

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CS4024 - DIRECTED STUDY FOR MMPT 2
ECTS Credits: 6
**Computer Science & Information Systems**

**Rationale and Purpose of the Module:** The aim of this module is to give students the skills required to perform a research-based, literature review in a specific area and to critically appreciate media representative of this area.

**Syllabus:** Students are exposed to a range of music and video technology, from the 1940s to the present day: Musique Concrète - Paris, Milan, United States, and Elektronische Musik - the work of the Cologne School and Milan, early live electronic music, John Cage, David Tudor, development of film, Italian Neo-realism, Hollywood, digital cinema and video. They select their specific area of interest from this range of material and carry out an individual, faculty-supported research review in this area.

Prerequisites: CS4032

**CS4026 - DIGITAL MEDIA SOFTWARE AND SYSTEMS 4**
ECTS Credits: 6

**Computer Science & Information Systems**

**Rationale and Purpose of the Module:** To undertake a series of laboratory projects creating music composition systems.

**Syllabus:** 1. Survey of algorithmic and generative composition techniques 2. Real-time methods for sound and music generation 3. Implementation of random and stochastic systems, and iterative systems (e.g., fractal and chaos) 4. Live performance techniques 5. Aesthetics and critiques of contemporary musical examples

Prerequisites: CS4034, CS4063

**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.

**Syllabus:** Search Engine Optimisation (SEO), Structure of an e-business model (EBM), Classification of EBMs; taxonomy of EBMs. Evolution of the architecture of web applications. Architectures for e-business: Logical architecture: client/server and n-tier applications, application services; Technological architecture: components, database choices; Organisational architecture: customer service distinctions, ownership. Maintaining application state: Cookies, hidden fields, sessions. 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-mail 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

**CS4034 - DIGITAL MEDIA SOFTWARE AND SYSTEMS 3**
ECTS Credits: 6

**Computer Science & Information Systems**

**Rationale and Purpose of the Module:** To introduce students to the principles behind graphic-design & animation and the practice of creating graphics and animations.


**CS4036 - ADVANCED DIGITAL AUDIO AND VIDEO**
ECTS Credits: 6

**Computer Science & Information Systems**

**Rationale and Purpose of the Module:** To advance practical methods to artistic practice.

**Syllabus:** Advanced approaches to composition and structure; The phenomenology of time; Collaborative and service logistics; Installation and real-time interactive systems; Real-time performance software for video and audio; Analysis of software systems and key works.

Prerequisites: CS4044, CS4054

**CS4043 - GAMES MODELLING DESIGN**
ECTS Credits: 6

**Computer Science & Information Systems**

**Rationale and Purpose of the Module:** The aim of the module is to provide students with knowledge to use an appropriate methodology in order to develop a digital game. On successful completion of the module the student will be able through use of appropriate tools and techniques to construct a model, design a digital game prototype and document it.

**Syllabus:** The game idea: starting points, intended audience, limitations; The elements of a game play: non-linearity, game mechanics, controls and inputs, output and feedback, modelling reality; game elements: characters, items, objects and their behaviour, functionality, mechanisms; Challenge, Fantasy, Fun, Depth and Focus; Gaming genres; Linear storytelling character versus non-linearity of the game play: places for storytelling, story scripting;
The Game Development Life Cycle: Conceptual phase: base architecture, base game play and story lines, game mechanics and flow, conceptual game model;
Detailed Game Design phase: game play, scenes and screens, game flow and progression, levels in different games (order, components, and goals), navigation, user interface, interactivity and immersion, game technology (hardware, software and limitations, tools and techniques to integrate props, media objects, special effects, storage and retrieval), platform and genre-specific design issues of 3D games;
Development phase and playtesting, refining and aesthetics;
Game Documenting phase: the Design Document and its elements;

Prerequisites: CS4031

Rationale and Purpose of the Module: Students will extend their knowledge and the approaches needed to undertake: A research based literature review of a given theme. A critical appreciation based in listening and seeing works representative of a theme.

Syllabus: Developments in technology and design post 1945.
- Multimedia.
- Digital Video.
- Interactive environments.
- Digital and interactive art.
- Computer graphics.
- Computer networks.
- Online communities.
- Personal computing.
- Ubiquitous and mobile computing.
- Virtual reality.

Prerequisites: CS4012, CS4512

CS4052 - FOUNDATIONS OF INTERACTION DESIGN
ECTS Credits: 6

Computer Science & Information Systems

Rationale and Purpose of the Module: This module provides an overview of the discipline of Interaction Design, and of its origins and conceptual and methodological basis. The topics discussed include:
- Overview of literature dealing with issues related to designing interaction (multidisciplinarity, variety of conceptual approaches, etc.).
- Exploration and analysis of various approaches to interaction design as a discipline.
- In depth discussion of notions of interactivity and interaction, and of the role of the interaction designer.
- Discussion of notions of narrative and narrativity.
- Analysis of different media and their interaction capabilities.
- Discussion of interaction design methodologies (data analysis, concept generation and development techniques, interaction design communication).

Syllabus: This course will provide the student with an understanding of the key elements required for the design of interaction. After a consideration of basic principles of design, the key features of narrativity and interactivity will be explored and analysed. The potential of different kinds of media to support interactivity will be studied. Methods of involvement of participants in the creation of new media will also be covered.

Prerequisites: CS4031

CS4056 - MOBILE APPLICATION DESIGN
ECTS Credits: 6

Computer Science & Information Systems

CS4064 - DIRECTED STUDY DMD 2
ECTS Credits: 6

Computer Science & Information Systems

Rationale and Purpose of the Module: Students will extend their knowledge and the approaches needed to undertake: A research based literature review of a given theme. A critical appreciation based in listening and seeing works representative of a theme.

Syllabus: Developments in technology and design post 1945.
- Multimedia.
- Digital Video.
- Interactive environments.
- Digital and interactive art.
- Computer graphics.
- Computer networks.
- Online communities.
- Personal computing.
- Ubiquitous and mobile computing.
- Virtual reality.

Prerequisites: CS4042

CS4065 - WEB INFRASTRUCTURE
ECTS Credits: 6

Computer Science & Information Systems

Rationale and Purpose of the Module: This module is intended to familiarise media students with computer programming. Students will learn how to write their own programs to manipulate images, sound files, movies and text.

Syllabus: Vector and bitmaped image formats;
- Drawing simple shapes and drawing text on existing images;
- How we digitize/encode sounds; Nyquist theorem;
- Manipulating samples;
- Using iteration and selection constructs to increase/decrease sound, normalizing sound;
- Creating sound clips, splicing sound, reversing and mirroring sound;
- Composing and blending sounds;
- Encoding, manipulating and creating movies;
- Reading from and writing to text files; string manipulation;

Prerequisites: CS4061

CS4072 - MEDIA PROGRAMMING 2
ECTS Credits: 6

Computer Science & Information Systems

Rationale and Purpose of the Module: This module is intended to familiarise media students with computer programming. Students will learn how to write their own programs to manipulate images, sound files, movies and text.

Syllabus: Vector and bitmaped image formats;
- Drawing simple shapes and drawing text on existing images;
- How we digitize/encode sounds; Nyquist theorem;
- Manipulating samples;
- Using iteration and selection constructs to increase/decrease sound, normalizing sound;
- Creating sound clips, splicing sound, reversing and mirroring sound;
- Composing and blending sounds;
- Encoding, manipulating and creating movies;
- Reading from and writing to text files; string manipulation;

Prerequisites: CS4061
Techniques to improve event processing performance programs.

Introduction to multiprocessor support for event driven programs and shown how to improve event processing through parallel event transformation.

CS4074 - AUDIO AND VIDEO PRODUCTION
ECTS Credits: 6

Computer Science & Information Systems

Rationale and Purpose of the Module: To provide the student with an understanding of:
(1) the techniques for recording, processing and dissemination of audio and video
(2) audio and video processing on both the temporal and spectral domain.


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.

CS4078 - APPLIED INTERACTION DESIGN
ECTS Credits: 6

Computer Science & Information Systems

Rationale and Purpose of the Module: This module will provide the student with knowledge of and practical experience in using techniques for the design of engaging interaction. Building on the design knowledge and technical skills the students have acquired at this stage of their course, applied interaction design problems will be presented to the students for analysis, reflection and intervention. Adaptation of Interaction Design methods will be discussed, and the particular perspective of Participatory Design will be examined in detail.

Syllabus: This module deals with topics and methodologies for Interaction Design work. The topics include:
- Overview of the latest literature and current practical projects in interaction design
- Exploration and evaluation of practical approaches to interaction design as a discipline in a variety of current settings, and particularly of Participatory Design methods.
- Exploration of novel interaction modalities around tangible, ubiquitous and wearable devices.
- Application and adaptation of interaction design methodologies to specific design settings.
- Discussion and review of sensitive design settings such as healthcare, safety-critical environments, education, etc.
- The role of high-fidelity prototypes in developing the interaction design process. The discussion and analysis of these topics will be based around practical interaction design assignments.

CS4084 - MOBILE APPLICATION DEVELOPMENT
ECTS Credits: 6

Computer Science & Information Systems

Rationale and Purpose of the Module: The module will focus on the tools and environments that exist to help developers create real world applications that run on wireless and mobile devices. A strong emphasis will be placed on providing students with hands on experience in the programming and testing of applications for mobile devices. Throughout this module, students will use an object oriented programming language, basic APIs and specialised APIs to develop applications for mobile devices.

Syllabus: Introduction to the world wide web: web browsers, web serves and clients, uniform resource locators, the hypertext transfer protocol (HTTP), processing HTTP requests and responses, world wide web consortium (W3C), static and dynamic content. Document content and structure, mark-up languages, elements and attributes, document type definition (DTD), hypertext and hypermedia. Hypertext MarkUp Language (HTML); standard HTML document structure, HTML syntax, tags, text formatting, colours, images, hypertext links, absolute and relative referencing, list, tables, frames and forms. Considerations when including audio, video and graphics; differentiating between file formats. Embedding PHP in HTML; assigning and using variable values, saving form input in variables, simple data types, detecting the data type of a variable, using operators: arithmetic, relational, logical; string operators, auto increment/decrement operators, operator precedence; selection and looping constructs. Sessions and cookies: creating a session and registering session variables, destroying a session; setting cookies, retrieving cookie data, deleting cookies. File manipulation: reading data from and writing data to files. Introduction to relational databases: tables, records, fields, primary keys and foreign keys. Introduction to Structured Query Language (SQL); creating tables: specifying field data types, retrieving, inserting, editing and deleting records. Connecting to a database in PHP and executing SQL commands.
**Syllabus:** Challenges to be faced when developing applications for mobile devices. Platform specific mobile applications and/or mobile web applications; mobile application lifecycles; Mobile applications and their architectures. Overview of operating systems (OSs) and Application Programming Interfaces (APIs) to choose from when developing applications for mobile devices. Comparison of native development environment options; software development kits (SDKs) and emulators. Installing and configuring the development environment. Managing application resources; designing user interfaces; data storage and retrieval options; synchronization and replication of mobile data. Communications via network and the web; networking and web services; wireless connectivity and mobile applications. Performance consideration: performance and memory management; performance and threading; graphics and user interface performance; use various facilities for concurrency. Security considerations: encryptions, authentication, protection against rogue applications. Location based application; location API.

Packaging and deploying applications for mobile devices.

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**CS4092 - PROGRAMMING 2**
ECTS Credits: 6

**Computer Science & Information Systems**

**Rationale and Purpose of the Module:** To continue with the design approach in Programming 1, through a series of design exercises given in tutorials. To introduce some classical algorithms, data structures, and other programming constructs, in the design and implementation of more complex programs. To place an emphasis on functional abstraction.

**Syllabus:**
- A more detailed (from Programming 1) examination of functions and parameter types.
- Introduction to two-dimensional arrays and their manipulation.
- Sorting and searching techniques; problem solution considerations.
- A more detailed (from Programming 1) examination of classes, objects and encapsulation.
- Introduction to common data structures: Stacks, linked lists, queues.
- Recursion: defined; iterative and recursive solutions; recursion as a problem solving technique; designing recursive algorithms; implementations of recursion.
- An introduction to file processing; file design considerations; streams; file types; file processing algorithms.
- An introduction to file processing; file design considerations; streams; file types; file processing algorithms.

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**CS4112 - COMPUTER SCIENCE 2**
ECTS Credits: 6

**Computer Science & Information Systems**

**Rationale and Purpose of the Module:** To introduce students to formal ways of thinking about programs, in terms of their syntactic structure, their design, and formal assertions about the progress of a computations.

**Syllabus:**
- Review of set theory. Union and intersection of sets, Cartesian, product functions as sets of ordered pairs. Review of logic propositions and logical connectives.
- Review of difference between variables in mathematics, and in imperative Programming Languages. Constructing mathematical/ assertions about individual statements, and program fragments. Preconditions and Post conditions Proof by induction of assertions about simple while programs.
- A semi-formal approach to structural induction, as a generalisation of induction over the natural numbers, together with its use in describing syntax of arithmetic and Boolean expressions.
- Using Grammars to describe formal languages or notations, regular grammars and context free grammars. BNF and EBNF. Syntax charts. Detailed application to specifying syntax of selected Programming language.
- Introducing static-semantic constraints into programming languages.
- Data Type Constructors, enumerated type, record, tagged and untagged variants, arrays, and sequential files, and their underlying sets of values as finite sets, Cartesian products, disjoint and normal Union, finite maps. Type completeness Copy semantics. Parameter-passing mechanisms and reference variables.
- Formal basis of some commonly-used simple design patterns such as extending a binary operation to an n-ary operation, composing a function with another function, including a function whose domain has been restricted, and grouping functions defined over the same domain into a single function.

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**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.

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**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
Computer Science & Information Systems

Rationale and Purpose of the Module: This module serves to provide students when an introduction to health care systems and the health informatics landscape (paying particular attention to Ireland) as well as the evaluation of information technology based systems and solutions within health care.

Syllabus: What constitutes a health care system; goals of health care systems; what is a good health care system; funding models; health care systems models. Analysis of health care systems; organisation, international agencies involved, policies and practice, financing and delivery of services, impact on sociological values; non-governmental organisation; regulations governing health care. Health informatics landscape: organisations, agencies, companies, authorities; products and services. Philosophical basis for performance measurement; analysis and interpretation; what is measurable versus what is important; typology of performance measures; what do we need, why do we need it and how do we build it; choice of indicators. Evaluation of information technology based systems and solutions within health care, measurement of health and health services processes.

CS4157 - SOFTWARE QUALITY
ECTS Credits: 6

Computer Science & Information Systems

Rationale and Purpose of the Module: To provide an understanding of the processes and techniques used to develop and maintain quality software.

Syllabus: Software quality assurance and standards; Software Inspections; Process versus Product quality and quality characteristics; Software testing techniques and strategies; Software Maintenance; Quality metrics; Evolution of software process; Introduction to ISO15504; Configuration Management.

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

CS4162 - VIRTUAL WORLDS
ECTS Credits: 6

Computer Science & Information Systems

CS4172 - E-HEALTH SYSTEMS
ECTS Credits: 6

Computer Science & Information Systems
CS4174 - PERFORMANCE TECHNOLOGY 1
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 digital musical instruments through a combination of laboratory based small group project work and lecture based learning.

Syllabus: This module will focus on the design and the creation of digital musical instruments. Students will design and build a musical instrument - a complete system encompassing musical controller, algorithm for mapping input to sound, and the sound output itself. Students will focus on improvisation techniques as they prepare their prototypes for live performance. The module will culminate in a musical performance where students will demonstrate their instruments.

Key topics will include:
- Sensor system implementation for live music performance.
- Software implementation of real time performance systems.
- Aesthetic issues in digital musical instrument performance.

CS4212 - COMPUTER ORGANISATION 2
ECTS Credits: 6

Computer Science & Information Systems

Rationale and Purpose of the Module: The purpose of this module is to provide an elaboration on, and extension of, topics in computer hardware and software as introduced in Computer Organisation 1. To introduce the student to programming in low-level languages.

Syllabus: - Extend and elaborate topics in computer hardware and software from Computer Organisation 1;
- A multilevel view of a modern computer;
- The operation of the CPU fetch-execute cycle;
- Organisation of memory: cache memory, main memory, registers, secondary memory;
- Simplification of Boolean expressions using 2, 3 and 4 variable Karnaugh maps;
- Design of a CPU arithmetic-logic unit to implement a set of specified functions;
- Assembly language programming: the assembly process;
- Introduction to microarchitectures;

Prerequisites: CS4211

CS4416 - DATABASE SYSTEMS
ECTS Credits: 6

Computer Science & Information Systems

Rationale and Purpose of the Module: Databases, particularly relational databases and database management systems (DBMSs) are central in the design and development of modern information systems. Understanding of their structure and skills in their application are fundamental aspects of a proper foundation in any domain of software development.

Syllabus: The concept of a DBMS and DB Architectures are introduced. This module will build upon the notion of a database as introduced in Information Modelling and Specification including revision of those concepts previously introduced, i.e. the relational data model, including issues such as Integrity Constraints, SQL, and Views.
- Concepts of databases and DBMSs;
- Database Architectures;
- Revision of the Relational Model; SQL Tables, Views and the DDL; Referential and Existential Integrity Constraints;
- Normalisation: Functional Dependencies; 1st, 2nd 3rd, 4th Boyce Codd and Fifth Normal Forms;
- Technologies: Transaction Management; ACID properties; Security; Data Storage & Indexing; Triggers & Active DBs; Query Optimisation; Distributed Architectures;
- Use of embedded SQL, cursors, triggers;
- Object DBs and Object Relational DBs;
- Data Warehousing, Decision Support & Data Mining;
- Emerging Technologies;

Prerequisites: CS4513

CS4457 - PROJECT MANAGEMENT AND PRACTICE
ECTS Credits: 6

Computer Science & Information Systems

Rationale and Purpose of the Module: To examine the processes by which the development of computer-based information systems are managed, and the considerations needed for successful implementation of such systems.

Syllabus: Why management of IS projects can be the deciding factor for success or failure; responsibilities for managing medium to large-scale information systems development projects; from project initiation to systems implementation; the tools and techniques applicable to planning, monitoring and controlling a project.

CS4458 - COMPUTER SUPPORTED COOPERATIVE WORK
ECTS Credits: 6

Computer Science & Information Systems

Rationale and Purpose of the Module: This module will introduce students to the CSCW and groupware field. It will cover basic concepts in the field and include an examination of software systems designed to support cooperative work - their design, use and evaluation.

Issues such as peripheral awareness, ownership of information, common information spaces, media spaces, group support systems, coordination mechanisms and contextual factors in the workplace will be studied. Students will use some groupware technologies and undertake a project.

Syllabus: The limitations of traditional HCI; Understanding the work context; Cooperative work; Methods for observing work - field studies and ethnography; Coordination mechanisms; Examination of variety of commercial and research collaborative systems; Constructing common information spaces; Examining collaborative learning in the workplace; Evaluation methods for CSCW; Open issues in the field.

CS4556 - BUSINESS ORIENTED PROGRAMMING LANGUAGES
ECTS Credits: 6

Computer Science & Information Systems

Rationale and Purpose of the Module: This module is
a prerequisite module for the Leveraging Legacy Applications module. It provides the foundations for that module by introducing students to languages and technologies required to work in the area of Legacy Systems. Additionally, by providing students with a working knowledge of COBOL, it equips them to work in the Business Computing Domain where an estimated 80% of all future deployment applications will include extensions to legacy COBOL programmes.


- Introduction to COBOL and OO-COBOL
- Types of Software Market: Horizontal (mass produced) and Vertical (bespoke).
- Types of maintenance - Corrective, Adaptive, Perfective, Preventative.
- Programming for maintenance and the vertical market - issues
- File-processing and business-oriented algorithms
- Structure of COBOL programs, Data Declaration, Assignment, File organizations, Control structures, Tables, Sorting and Searching, String handling, Intrinsic Functions, COBOL Report Writer
- Structure of OO-COBOL programs, OO-COBOL syntactic elements, Methods, Classes, Objects, Instantiation, Inheritance, Polymorphism.

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**CS4558 - LEVERAGING LEGACY APPLICATIONS**

ECTS Credits: 6

**Computer Science & Information Systems**

**Rationale and Purpose of the Module:** The rationale for this module is that it is important for programmers and analysts to be aware of the issues and techniques involved in replacing, converting, modernising, and integrating legacy systems. The year 2000 (Y2K) problem made us uncomfortably aware of the existence and importance of legacy systems and it is now clear that the problem of legacy systems is one that will persist for as long as there are new developments in languages, technologies, or techniques.

**Syllabus:** Introduction to XML, DTDs, the XML Schema, Separation of content from presentational information in XML documents (e.g. CSS);

The XML Document Object Model (XML DOM);
Languages for automated transformations of text documents (e.g. XSLT);
Introduction to Web Services and Service Oriented Architectures (SOA);
Legacy system characteristics;
Types of legacy system modernisation;
Reengineering of COBOL programs - Issues and Tools;
Approaches to Legacy System integration using object wrappers or web services;
Web enabling Legacy Systems;
Data migration - issues and solutions;

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**CS4566 - REQUIREMENTS ENGINEERING**

ECTS Credits: 6

**Computer Science & Information Systems**

**Rationale and Purpose of the Module:** System and software requirements exist at the boundary between the often conflicting needs and expectations of stakeholders and the myriad capabilities and potential of software to fulfill them. Special rare skills are essential in order to adequately elicit, specify, verify, validate and then manage both the scope of the system and the software requirements themselves. This module aims to introduce students to the necessary skills and make them aware of the real challenges that are presented by the requirements task.

**Syllabus:** System and software requirements
- The Requirements Engineering Process
- Stakeholders and their role in RE
- Requirements and Design
- The elicitation and discovery of requirements: RAD, Task Analysis
- Elicitation techniques: Prototyping and Scenarios, Viewpoints
- Discovering and Inventing Requirements: CRC Cards
- The modelling and analysis of requirements
- Problem Frames and modelling
- A comparative review of modelling techniques
- Perspectives and values in modelling methods
- Requirements Documentation: Standards and Templates
- Quality Measures of Software Requirements
- Documenting Functional Requirements
- Techniques for writing requirements
- Writing non-functional requirements
- Communication techniques

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**CS4826 - HUMAN-COMPUTER INTERACTION**

ECTS Credits: 6

**Computer Science & Information Systems**

**Rationale and Purpose of the Module:** The objective of this module is to develop an understanding of the
issues involved in the increasingly important area of human-computer interaction. The module will provide a broad introduction to a variety of topics concerning user requirements, user interface design, usability studies, integrating human factors in software development, and social and organizational factors involved in implementing systems. It will examine guidelines and standards, as well as emerging interaction paradigms. The widespread adoption of graphical user interfaces (GUIs), and the potential afforded by new developments such as groupware, multimedia, hypertext, and virtual reality systems all require that even greater attention be paid to how these technical developments can be packaged and presented suitably to the “user”.

Syllabus: The module addresses the nature of HCI. Specifically it covers the topics of: understanding the user, human information processing, perception, interfaces and interaction, input and output devices, use & design, the design process, requirements, evaluation, usability methods and tools, empirical and analytical methods, standards & guidelines, mobile technology, information appliances, social and organizational constraints, intelligent agents, and future trends.

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.

- 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.

CS4925 - BUSINESS INFORMATION TECHNOLOGY 1
ECTS Credits: 6

Computer Science & Information Systems

Rationale and Purpose of the Module: This module has two key objectives: 1) to introduce students to Information Technology/Information Systems in the overall business/social context and 2) to develop a more critical perspective on the role of IT/IS in society.

- Social Context: Socio Technical Environment; Defining the Socio Technical Environment (Individual, Group, Organisation and Society); Understanding and Capturing the Socio-Technical Environment.
- Organisational Context: Information Systems Planning and Strategy; Developing an Information Technology Plan; The Role of Managers in Technology Planning; Planning as Emergent.
- Market Context: High Technology Customer Behavior; Customer Decision Process; Lead Users; Business Information Technology Adoption; The Origins and Development of Innovation Diffusion Theory; Technology Adoption Life Cycle.

CU4014 - ANALYSING MEDIA DISCOURSE
ECTS Credits: 6

School of Languages, Literature, Culture and Communication

Rationale and Purpose of the Module: * Students will acquire knowledge about the linguistic features of media texts;
* Students will acquire skills to enable them to engage critically with a range of media texts;
* Students will be exposed to both qualitative and quantitative methods of analysing media texts;
* Students will acquire specific skills in Critical Discourse Analysis and Corpus Analysis and multimodal discourse analysis.

Syllabus: Text linguistics: This section of the course will introduce students to a range of concepts required to analyse media texts (e.g. morphology, syntax, semantics, grammar, lexicon, pragmatics) (3 weeks) Critical Discourse Analysis: Theory and Practice (3 weeks) û students will carry out an in-depth qualitative analysis of a number of media texts on a chosen topic. Corpus Textual Analysis: Theory and Practice (3 weeks) û students will build up a corpus of media texts on a particular topic from a variety of media and then analyse them using corpus linguistics software. Multimodal Discourse Analysis: Theory and Practice (3 weeks) û students will carry out a project in the area of New Media discourse analysis.

CU4026 - HOW TO READ A FILM: INTRODUCTION TO FILM STUDIES
ECTS Credits: 6

School of Languages, Literature, Culture and Communication

Rationale and Purpose of the Module: * To introduce students to the field of film studies.
* To give students the theoretical tools to analyse film.
* To give students an introduction to the field of film studies.

Syllabus: This module will make the distinction between knowing a lot about films and being able to address the question what is cinema. To this end the module will examine the techniques of film, critical approaches and how major theoretical movements have been applied to this field.

Prerequisites: CU4025

CU4096 - AFTER THE REVIVAL: STUDIES IN MODERN IRISH POETRY
ECTS Credits: 6
School of Languages, Literature, Culture and Communication

Rationale and Purpose of the Module: This module will introduce students to a range of twentieth-century and contemporary Irish poets writing in English addressing issues pertaining to nationalism, colonialism, literary modernism and gender. This module provides students with a survey of Irish poetry in English after Yeats and the Literary Revival; from Austin Clarke and Patrick Kavanagh to Seamus Heaney, Michael Hartnett, Medbh McCuckian, Eilean Ni Chuileanain, Paul Muldoon, Nuala Ni Dhomhnaill, among others. Matters to be explored include: the cultural politics of the Irish Free State; tradition, modernity and modernism; gender and the Irish poetic tradition, orality and poetic forms; and poetic representations and negotiations of the Northern Troubles.

Syllabus: Beginning with an assessment of the influence of the poetry of WB Yeats and anticipating the influence of the wider literary revival, the course will move chronologically forward to study the works of major poets such as Denis Devlin, Austin Clarke, Patrick Kavanagh, Thomas Kinsella, Seamus Heaney, Michael Hartnett, Eavan Boland, Paula Meehan and Medbh McCuckian. The course will consider matters such as the poets relationship to the nation and to the State; and will also measure the significance of the wider Irish poetic tradition, orality and poetic forms; and poetic representations and negotiations of the Northern Troubles.

CU4112 - CULTURAL STUDIES 2: LANGUAGE AND CULTURE
ECTS Credits: 6

School of Languages, Literature, Culture and Communication

Rationale and Purpose of the Module: This course is designed to serve as an introduction to basic concepts and theories in the study of language and culture. The various branches of the study of language and culture will be introduced and discussed in class lectures, with particular attention being paid to issue of globalisation. The more specific objectives of this course are:
* Recognize the fundamental relationship between language and culture.
* Describe current perspectives on the nature of language and culture from an applied linguistic context

Syllabus: Students will gain an indepth knowledge of the relationship between language and culture. The course will begin by introducing the Sapir-Whorf hypothesis and will then look at a further three core sections, namely:
1. Culture and language in use
2. Culture, language and the individual
3. Culture, language and society

Prerequisites: CU4111

CU4116 - CULTURAL STUDIES 4: CULTURAL THEORY
ECTS Credits: 6

School of Languages, Literature, Culture and Communication

Rationale and Purpose of the Module: To give students the opportunity to study, in depth, the writings of key cultural theorists of the 20th century. To develop an awareness of the place in theory in cultural practice. To develop skills of presentation, appraisal and comparison of material of high theoretical complexity.

Syllabus: This module will cover a number of different theorists and theoretical positions in sequence. The relevant theorists will include Matthew Arnold, Friedrich Nietzsche, Sigmund Freud, Laura Mulvey, Karl Marx, Theodor Adorno, Roland Barthes and Jean Baudrillard. The theoretical positions covered will include humanism, psychoanalysis, feminism, Marxism, neo-Marxism, structuralism, poststructuralism, semiotics and postmodernism.

CU4118 - EUROPEAN CINEMA
ECTS Credits: 6

School of Languages, Literature, Culture and Communication

Rationale and Purpose of the Module: To give students a comprehensive overview of the major cinematic movements in modern Europe with an introduction to some of the major directors and their oeuvre. The module will also examine the techniques of film as employed by these directors, their critical approaches and how major theoretical movements have been influential in their work.

EC4004 - ECONOMICS FOR BUSINESS
ECTS Credits: 6

Economics

CU4128 - NEW MEDIA, LANGUAGE AND GLOBALISATION
ECTS Credits: 6
Rationale and Purpose of the Module: The purpose of this module is to provide the student with an understanding of intermediate level micro- and macro-economic theory and practice. The first half of the module is concerned with issues affecting the macroeconomy and Ireland's membership of the European Monetary Union. In the second six weeks of the module students will be exposed to current thinking in economics for business from a micro-economic perspective. In this section of the module students will not only engage with theoretical ideas and constructs but they will also be required to apply the material covered to concrete real-life micro economic situations. The intention of the module is to develop the students understanding of the nature, scope and functioning of the economy so as to have an appreciation of the changing set of problems business decision-makers face and the economic context in which firms operate.

Syllabus: Section one of the module is concerned with the macroeconomy. The topics covered include: the expectations-augmented Phillips curve, purchasing power parity, interest rate parity and the Fisher effect. These theories are combined to obtain what is known as the "open economy monetary model". This model is then used to evaluate particular issues including the long-run performance of the Irish economy and the factors underlying the 'Celtic Tiger' period. The module continues by extending the analysis of production and cost theory developed in first year microeconomics. Imperfect market structures of the firm are explored including analysis of game theory. Labour market decisions are analysed with respect to the supply and demand for labour and wage determination, the latter forms the key link between the micro and macro sections of the module. An overview of the theoretical and practical exposition of business objectives along with key issues facing the firm in the business environment in addition to the role of government are then explored.
Section IV Integration and Investment Relations
Topic 7 Economic Integration

Topic 8 International Resource Movements

Section V Balance of Payments and Exchange Rates Markets
Topic 9 Balance of Payments
Topic 10 Foreign Exchange Markets and Exchange Rates

Section VI The International Economy in Operation
Topic 11 Exchange Rate Regimes

ECTS Credits: 6
EC4018 - MONETARY ECONOMICS

Rationale and Purpose of the Module: This course in Monetary Economics covers topics in Financial Markets, Financial Institutions, Central Banking, International Finance and Monetary Theory. These topics are discussed at various stages in the course. The central theme is to develop a dynamic monetary model of a small, open economy. The Course Outline (see below) explains how this is achieved and at what point the other topics are examined. Among the policy issues discussed are: economic adjustment to asymmetric shocks given the constraints of monetary union; the operations and policies of the European Central Bank; the transmission of monetary policy in the Euro-area; and the determination of interest rates.

Syllabus: 1. Introduction to the Theory of Income Determination
   &bull; Equilibrium in the Goods and Services Market
   &bull; Deriving the SRAS model
   &bull; Adjusting to Demand-side Shocks
   &bull; Adjusting to a Supply-side Shock

2 Money and Banking
   &bull; Money Creation in a Modern Economy
   &bull; The money multiplier
   &bull; The Role of a Central Bank
   &bull; Seigniorage
   &bull; Lender of last resort
   &bull; High-powered money and the Money Multiplier
   &bull; Instruments of Monetary Policy
   &bull; Money and Interest Rates in a Closed Economy
   &bull; The Demand for Money
   &bull; Money Market Equilibrium
   &bull; Aggregate Demand and Interest Rates
   &bull; Monetary Policy and the Keynesian, Classical Debate
   &bull; Monetary Financing

3 The IS-LM Model
   &bull; Equilibrium in the Goods Market: The IS Curve
   &bull; Equilibrium in the Money Market: The LM Curve
   &bull; The Relative Effectiveness of Fiscal and Monetary Policy in the IS-LM Model
   &bull; The IS-LM Model and Aggregate Demand

4 The Phillips Curve and the Inflation-Unemployment Trade-off
   &bull; The expectations-augmented Phillips curve
   &bull; Deflation, Expectations and Credibility
   &bull; The sacrifice ratio
   &bull; The Augmented Phillips Curve: Evidence from the Euro-area
   &bull; Estimates of the natural rate of unemployment
   &bull; Recent Developments Relating to the Phillips Curve
   &bull; The Phillips Curve and the AD-AS Model

5 The Mundell-Fleming Model
   &bull; Internal and External Balance
   &bull; Introduction to the Mundell-Fleming Model
   &bull; The Model Under Fixed Exchange Rates
   &bull; The Model Under Floating Exchange Rates
   &bull; Exchange Rate and Country Risk
   &bull; Economic Policy, Output and the Current Account
   &bull; The Aggregate Demand Curve

Guest Lecture Dr Alan Ahearne NUI, Galway
   &bull; How has the ECB responded to the financial crisis?
   Long term refinancing operations (LTRO) and Outright Monetary Transactions (OMT).
   &bull; How has the Federal Reserve responded to the financial crisis? Quantitative easing (QE).

Guest Lecture John Rowe Financial Markets Division, Central Bank of Ireland
   &bull; Monetary Policy Framework
   &bull; National Central Bank's and the Liquidity Position of Commercial banks.
   &bull; Forecasting Liquidity Facilities.
   &bull; Reaction of Central Bank's to the Financial Crisis.

6 The IS-LM Model
   &bull; Equilibrium in the Goods Market: The IS Curve
   &bull; Equilibrium in the Money Market: The LM Curve
   &bull; The Relative Effectiveness of Fiscal and Monetary Policy in the IS-LM Model
   &bull; The IS-LM Model and Aggregate Demand

5 The Phillips Curve and the Inflation-Unemployment Trade-off
   &bull; The expectations-augmented Phillips curve
   &bull; Deflation, Expectations and Credibility
   &bull; The sacrifice ratio
   &bull; The Augmented Phillips Curve: Evidence from the Euro-area
   &bull; Estimates of the natural rate of unemployment
   &bull; Recent Developments Relating to the Phillips Curve
   &bull; The Phillips Curve and the AD-AS Model

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Guest Lecture Dr Alan Ahearne NUI, Galway
   &bull; How has the ECB responded to the financial crisis?
   Long term refinancing operations (LTRO) and Outright Monetary Transactions (OMT).
   &bull; How has the Federal Reserve responded to the financial crisis? Quantitative easing (QE).

Guest Lecture John Rowe Financial Markets Division, Central Bank of Ireland
   &bull; Monetary Policy Framework
   &bull; National Central Bank's and the Liquidity Position of Commercial banks.
   &bull; Forecasting Liquidity Facilities.
   &bull; Reaction of Central Bank's to the Financial Crisis.
Syllabus: Topic 1. Introduction to Macroeconomics
Irish macroeconomy, political economy, macroeconomic constraints, globalization, macroeconomic models and the time horizon, a brief history.

Aggregate production function, measuring the output of nation’s, the national income accounts, adjusting for inflation, the business cycle, the long-run performance of the Irish economy.

Topic 3. Inflation
Measuring inflation, the Irish inflation record, the effects of inflation, deflation.

Topic 4. The Labour Market and Unemployment
The labour market, the natural rate of unemployment, frictional and structural unemployment, cyclical unemployment, why doesn’t the labour market clear?, the costs of unemployment, reducing unemployment, unemployment in Ireland, unemployment in the Euro area.

Topic 5. Introduction to the Theory of Income Determination
Macroeconomic models, Keynes’s General Theory, equilibrium in the goods and services market, aggregate demand, aggregate supply, equilibrium, adjusting to demand-side shocks, adjusting to supply-side shocks, real GNP and unemployment.

Topic 6. Consumer Theory and the Income Determination
Income, consumption and savings, personal income, consumption and savings in Ireland, the Keynesian multiplier.

Topic 7. Introduction to the Theory of Fiscal Policy
Fiscal policy, assessing the stance of fiscal policy, problems in implementing stabilization policy, taxation and the supply-side of the economy, the dynamics of debt stabilization.

Topic 8. Fiscal Policy and Economic Planning in Practice: The Irish Record
Economic planning, Irish fiscal policy in historical perspective, is there such a thing as Expansionary Fiscal Contraction?, the end of history.

Topic 9. Money and Banking
What is money?, types of money, functions of money, creation of money, the role and functions of a Central Bank, control of money, the credit-fuelled property bubble and the crash.

Topic 10. Money and Interest Rates in a Closed Economy
The demand for money, money market equilibrium, nominal and real interest rates, aggregate demand and interest rates, monetary policy in a closed economy, crowding-out, government monetary financing.

Topic 11. The Balance of Payments and the Exchange Rate
Balance of payments, the significance of the current account balance, the foreign exchange market, the exchange rate of the Irish pound and the euro, the determinants of exchange rates, factors influencing exchange rates in the medium term, exchange rate regimes.

Topic 12. Inflation and Interest Rates in Open Economies.
Purchasing power parity (PPP), PPP and the real exchange rate, harmonized competitiveness indicators, relative PPP, uncovered interest rate parity theory.

The growth of population, the standard of living, interpreting the record 1922-'61, the 1960s, the record since 1971, the property and construction bubble 2001-’07, the great recession and its aftermath.
globalisation movement that views the process of globalisation as the main cause of problems. This module seeks to provide the student with a balanced and objective analysis of the main issues confronting the world economy and through the use of economic theory, empirical evidence and objective analysis seeks to distinguish between fact and fiction.

**Syllabus:** The module will have as its main objective an exploration of the main issues that confront the world economy. While it would be unreasonable to expect one module to cover all the issues in depth the following will be analysed and discussed:

**Topic 1:** (i) The identification of the causes of the financial crisis and fiscal crises in the world economy and in Ireland. (ii) The current state of the world economy; an overview of the current and future economic challenges facing the globalised economy. (iii) Review of history of the global economy.

**Topic 2:** (i) Foreign trade and protectionism: stylised facts about trade and review of gains from trade. (ii) Trade policy rules and evolution of international trade regime; the Doha Round and the role of the World Trade Organisation (WTO).

**Topic 3:** (i) The evolution of international monetary and financial system. The role of the multilateral institutions such as the International Monetary Fund (IMF) and the World Bank. (ii) Changing hegemonic role of the US economy in international political economy and the rise of the BRIC economies. (iii) The European integration; why many EU countries formed a monetary union; macroeconomics in the Eurozone.

**Topic 4:** The economic performance and problems confronting long developed countries; The development prerequisites, the development history: 1945-1980 and the development policy since 1980; The importance of aid from rich countries.

**Topic 5:** (i) The policy role, challenges and opportunities of international migration; recent trends and the EU single labour market. (ii) Changing facets of international production; analysis and policy implications of outsourcing; trends in the patterns of offshoring and outsourcing.

**Prerequisites:** EC4102, EC4101

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**EC4112 - MACROECONOMICS (FOR NON-BUSINESS)**

**ECTS Credits:** 6

**Economics**

**Rationale and Purpose of the Module:** The purpose of this module is to introduce the student to the principles underlying the macroeconomy. This is the study of how aggregate economic variables such as, the real growth rate, inflation and unemployment, behave and how the government and central bank can influence their behaviour. The first part of the course deals with key topics such as the theory of income determination, the consumption function and fiscal policy as well as the foreign exchange market. The latter part examines monetary policy instrument including how interest rates are determined and how monetary policy is conducted by the European Central Bank. The benefits and costs of economic and monetary union are also addressed in this introductory macroeconomics module.

**Syllabus:**

1. GNP, business cycle, unemployment, inflation. Policy constraints;
2. The Theory of Income Determination: Basic Model, The aggregate supply and demand model: Three issues; including demand and supply-side shocks, Okuns law, Natural real GNP and automatic adjustment mechanisms.
3. The Consumption Function and Income Determination including disposable income, consumption and saving; Keynesian multiplier; average and marginal propensity to consume.
4. Fiscal Policy and the Business Cycle Stabilisation policy, fiscal policy in Ireland
5. Money and Banking Definitions; types of money; modern banking systems; money creation, money multiplier; instruments of monetary policy.
7. Interest Rate Determination. Monetary policy; demand for money; money market equilibrium, monetary policy and the Keynesian, Classical debate.
8. The Balance of Payments and Exchange Rate Theory. Foreign exchange market, flexible exchange rates, real exchange rates, trade-weighted exchange rate index, Central Bank intervention, external reserves, fixed exchange rates.
9. Purchasing power parity including absolute and relative PPP.
10. Fixed Exchange Rate Systems including the
operation of fixed exchange rate systems; monetary adjustment mechanism; sterilisation; fixed exchange rate systems in the past; benefits and costs 11. European Monetary Union including economic benefits and costs to Ireland; adjusting to economic shocks 12. The European Central Bank The design of the ECB; price stability; central bank independence; monetary policy in EMU.
Prerequisites: EC4102

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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 micro economic 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 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, EC4004

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EC4408 - PUBLIC FINANCE
ECTS Credits: 6

Economics

Rationale and Purpose of the Module: This course covers the theory and practice of public finance. It examines the theoretical rationale for government intervention in modern increasingly globalised economies. More specifically it examines the theory and practice of the allocative, stabilising and re-distributive roles of government. This involves analysis of theory and practice in relation taxation and expenditure decisions.

Prerequisites: EC4101, EC4102, EC4004

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EC4711 - EU ECONOMIC ENVIRONMENT
ECTS Credits: 6

Economics

Rationale and Purpose of the Module: To provide students with an understanding of the economic structures and policies operating at the level of the European Union, together with an analysis of the progress towards integration, its impact on member states and the rest of the world. The module provides a framework understanding of the EU, its institutions, and their competences in key areas of economic activity.

Syllabus: The topics covered are set out as follows: 1. EU Competition Policy; 2. The EU Trade or Common Commercial Policy (CCP); 3. Monetary Integration and Economic and Monetary Union (EMU); 4. The Common Agricultural Policy (CAP); 5. The EU and Central and Eastern Europe (Enlargement); 6. The EU and the Less Developed Countries (LDCs).
Prerequisites: EC4034, EC4013

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EE4008 - AVIONICS
ECTS Credits: 6

Electronics & Computer Engineering

Rationale and Purpose of the Module: * To make the students aware of the principles of operation of avionic systems and the application of telecommunications and control techniques to aeronautics. * To introduce the students to the principles of radar, radio navigation and telecommunications systems.

Syllabus: Principle of operation of avionic systems
Brief description of instrumentation, sensors, actuators, computer based data acquisition and control systems. Introduction to navigational, communications and air traffic control systems.
Air Data Systems
Inputs ; pressure, air temperature. Outputs ; pressure altitude, air speed, mach number, air density, temp, etc.
Air data instruments; altimeter, airspeed indicator, vertical speed indicator, mach metre, etc.
Compass Systems
Gyrosopic Instruments, mechanical gyros, gimbaled gyros, strap down gyros, Laser Gyros, Sagnac effect, Inertial Navigation Systems
Flight control systems
Aircraft use of radio; navigation, radar, voice and data communication
Radio wave propagation and radiation, propagation in the real atmosphere, ground effects: multipath and clutter, ground waves, sky and space waves.
Modulation, AM, FM, SSB, etc.
Radio antennas, unipole, dipole, loop antenna, capacitive antenna, microwave horn
Avionics radio systems across different frequency bands

Introduction to Principles and Use of Radar
Primary and secondary radar systems
Antennas, mechanically steered radar beams, phased arrays.
Pulse radar, radar transmitters and receivers, radar displays, moving target indicator. Doppler radar, CW and frequency modulated radar.
Radar range equation, input noise, signal-to-noise ratio.
Radar cross section of target aircraft 2D and 3D radar systems
Radar resolution, in range, azimuth and elevation.

Navigation Theory and Systems
Navigation aids for aircraft
Radio Navigation and Telecommunications Systems
Instrument Landing Systems
Microwave Landing Systems
Loran C, Very High Frequency Omnidirectional Range (VOR), GPS, Automatic Direction Finder (ADF), Non Directional Beacons (NDB).
Navigation sub systems surveillance radar for Air Traffic Control.

Digital Data Busses used on Aircraft
MIL STD 1553, ARINC 429, A629

Prerequisites: EE4001, EE4004

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**EE4012 - CIRCUIT ANALYSIS 1**
ECTS Credits: 6

**EE4013 - COMPUTER NETWORKS**
ECTS Credits: 6

**EE4014 - ELECTRICAL ENERGY**
ECTS Credits: 6

**EE4018 - ENGINEERING MANAGEMENT**
ECTS Credits: 6

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**Electronics & Computer Engineering**

Rationale and Purpose of the Module:

Comprehensive overview of the workings of a technology-based business, and the chemistry of techniques available for the prudent management of such a business in an increasingly competitive environment.

**Syllabus:** THE FIRM AND IT’S ENVIRONMENT.
General external analysis (national, international and global) STEP Industry analysis (5 forces, OT). Internal analysis (SW)

Management: Planning (PERT), Controlling (Loops), Motivation (Expectancy and other theories), Organising, Coordinating. Job Design, Decision Making, Leadership Theories, Team working and development. communication. Overview of essential practical skills.

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**EE4022 - SEMICONDUCTOR DEVICE FUNDAMENTALS**
ECTS Credits: 6

**EE4023 - DISTRIBUTED SYSTEMS**
ECTS Credits: 6

**EE4024 - ELECTRICAL ENERGY (ELECTRICAL MACHINES)**
ECTS Credits: 6

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**Electronics & Computer Engineering**

Review of electromagnetism, Faradays, Ampere's and Lezs laws, MMF, flux, flux density, magnetic field intensity and reluctance, self and mutual inductance, magnetic materials, BH curves, core losses. Magnetic circuits, electric circuit analogies, analysis of simple magnetic circuits.
Transformers: Construction and principles, ideal transformer, voltage and current transformers, power transformers, single/phase, equivalent circuits, open and short circuit tests, application in power systems, per unit system.
Machines - DC motors and generators: construction and principles, separately excited, series, shunt and compound machines. Voltage and torque equations.Equivalent circuits, Power flow. Machine characteristics: open circuit/magnetization, speed, torque and dynamic characteristics. Which configuration for which application. DC machines in modern power generation and motion control. AC machines, rotating magnetic fields, alternators, 3 phase generators, salient pole/cylindrical rotor, derivation of equivalent circuit from open circuit and short circuit tests, synchronous reactance, the phasor diagram (of cylindrical rotor machine) and the Power Angle Curve. Synchronising to an infinite busbar. Steady state stability limit.
Electrical machines developments for renewable energy generation.
AC power real and reactive power calculations. Power factor correction, balanced 3 phase systems analysis, star and delta connected loads, advantages of 3 phase systems, the per unit system.

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**EE4028 - TELECOMMUNICATION NETWORK ARCHITECTURES 2**
ECTS Credits: 6

**EE4034 - TELECOMMUNICATIONS FUNDAMENTALS**
ECTS Credits: 6
EE4102 - ELECTRICAL SCIENCE 2  
ECTS Credits: 6  
Electronics & Computer Engineering  
Rationale and Purpose of the Module: To develop a good understanding of ac circuit descriptions using vectors (and phasors) with numerous examples, using a simplified approach. 
Prerequisites: EE4101

EE4117 - ELECTROMAGNETICS 1  
ECTS Credits: 6  
Electronics & Computer Engineering  
Rationale and Purpose of the Module: This module is a 3rd year core module for BE in Electronic Engineering (LM070). 
Syllabus: Review of vector calculus. Electrostatics - Electric field, calculation of the electric field, electric potential, conductors and dielectrics, electrostatic field boundary conditions, capacitance. Poisson/Es and Laplace/Es equations. Current density. Resistance calculations. Magnetostatics - Magnetic flux density, vector magnetic potential. Biot-Savart law, magnetic field intensity, magnetic circuits, magnetic materials, inductance. Time-varying fields - Faraday/Es law, Maxwell/Es equations, time harmonic electromagnetics, plane electromagnetic waves in lossfree and lossy media, low-loss dielectrics and conductors, power propagation and the Poynting vector, instantaneous and average power densities. Transmission lines - Transverse electromagnetic waves along a parallel-plate transmission line, transmission line equations, wave characteristics along infinite and finite lines, transmission lines as circuit elements, resistive and arbitrary terminations, the Smith chart, impedance matching.

EE4124 - CONTROL 1  
ECTS Credits: 6  
Electronics & Computer Engineering  
Rationale and Purpose of the Module: The module introduces students to some basic control theory, Dynamic System Modelling, open- and closed-loop systems, signal flow graphs, time response of first and second order systems. This module also gives students a basic introduction (from the control perspective) to support the control theory and dynamic systems modelling to some of the basic devices used in control, including actuators, sensors and transducers. 
Prerequisites: MA4001, MA4002, MA4003

EE4216 - CONTROL 2  
ECTS Credits: 6  
Electronics & Computer Engineering  
Rationale and Purpose of the Module: This module extends fundamental Control principles with much more emphasis placed on the application of linear analytical techniques to control system design. 
Syllabus: LINEAR SYSTEM ANALYSIS: Bode, Nyquist, and root locus, transfer function of plant with delay and non-minimum phase systems. Stability and Performance analysis using Bode, Nyquist, Routh-Hurwitz, and Root Locus methods. Design techniques for system compensation using Bode diagrams, Nichols charts and Root Locus. Lead and lag compensation, the application of these using op-amps as an example, internal compensators. Introduction to Modern Control methods using State Space Techniques. PROCESS CONTROL: Terminology and practice, application and use of three term control, PID design in the frequency domain, integral wind-up and similar problems, Benchmark methods for tuning PID controllers, (Ziegler-Nichols, Haalman etc.).

EE4218 - CONTROL 2  
ECTS Credits: 6  
Electronics & Computer Engineering  
Rationale and Purpose of the Module: To further develop analysis and design skills in Automatic Control 
Syllabus: LINEAR SYSTEM ANALYSIS: Bode, Nyquist, and root locus, transfer function of plant with delay and non-minimum phase systems. Stability and Performance analysis using Bode, Nyquist, Routh-Hurwitz, and Root Locus methods. Design techniques for system compensation using Bode diagrams, Nichols charts and Root Locus. Lead and lag compensation, the application of these using op-amps as an example, internal compensators. Introduction to Modern Control methods using State Space Techniques. PROCESS CONTROL: Terminology and practice, application and use of three term control, PID design in the frequency domain, integral wind-up and similar problems, Benchmark methods for tuning PID controllers, (Ziegler-Nichols, Haalman etc.).
**EE4314 - ACTIVE CIRCUIT DESIGN 2**

**ECTS Credits: 6**

**Electronics & Computer Engineering**

**Rationale and Purpose of the Module:** This module introduces the basic properties of operational amplifiers feedback, and their use in both linear and non-linear applications as well as the introduction of AC low frequency design. An introduction to Analogue signal conversion is also given.

**Syllabus:**
- The DIFFERENTIAL AMPLIFIER AS A TWO ENDED INPUT AMPLIFIER. Introduce the diff amp as the input element to Op Amps. Define the terms Differential Gain, Common Mode Gain and Common Mode Rejection Ratio.
- OP-AMP CHARACTERISTICS: Simplified internal view of a typical 3-stage op-amp, current limiting, open-loop transfer curve, offset error. Op-amp configurations; current in, voltage out etc. Finite gain errors. Slew limitations.
- OP-AMP LINEAR APPLICATIONS: Selected linear applications, including voltage amplifiers, regulators, integrators and instrumentation issues.
- OP-AMP NON-LINEAR APPLICATIONS: Comparators, Schmitt trigger, rectifiers, peak detectors etc. Non-linear oscillators (square-triangle), monostable circuits.
- A.C. COUPLED AMPLIFIERS: Low frequency limitations, break points, Bode plots, design steps.

**Electronics & Computer Engineering**

**Rationale and Purpose of the Module:** This module introduces students to integrated circuit design, to the limitations that apply to chip-level components, and to IC design methods.

**Syllabus:**
- Integration of BJTs, JFETs and MOSFETs. Device characteristics.
- Analogue bipolar design methods: mirrors, high-gain stages, output buffers.
- Analogue CMOS design methods: mirrors, high-gain stages, output buffers.
- Digital logic families, an overview.
- Analogue building blocks: overview of op-amps, comparators and PLLs.CMOS and BIMOS technologies.
- Review of some analogue ICs, bipolar and MOS.

**Prerequisites:** EE4316

**EE4328 - POWER ELECTRONICS**

**ECTS Credits: 6**

**Electronics & Computer Engineering**

**Rationale and Purpose of the Module:** This module will give students (electronic, Robotic, Control and Energy students) an understanding of modern power electronics both at the device . products level and at the renewable energy generation and distribution level.

**Syllabus:**
- Introduction (examples of typical power conversion applications e.g. a complete computer power supply system block diagram/space craft system, importance of efficiency, comparison linear vs switching supplies, overview key components utilised in power conversion)
- Switch realisation: semiconductor switches: diodes, Power MOSFETs, Thyristors, GTOs, IGBTs, properties, circuit symbols, comparative characteristics and application areas, power losses in switches. The ideal switch, ripple and switching frequency, conduction losses, switching losses.
- Switch mode power conversion: basic concepts; role of inductors, capacitors and transformers.
- Analytical treatment of converters in equilibrium (steady-state converter analysis).
- Modelling and simulation of converter in steady state (SIMPLIS)
- Overview conversion topologies (non-isolating buck, boost, buck-boost)
- Three phase full wave uncontrolled rectifier with inductive loads: circuit diagram, waveforms, output voltage, input current, input harmonics.
- Single phase full wave thyristor controller rectifier: circuit diagram, waveforms and calculations.
- Inverters & main concepts, square wave inverters, Sine PWM inverters: circuit diagram, Circuit waveforms, Amplitude modulation index, Frequency modulation index.
- Variable Speed Drive: Fixed frequency induction motor torque speed characteristic, V/F operation, torque speed capability with V/F drive, typical V/F drive circuit diagram.
- Continuous vs discontinuous conduction mode.
- Converter dynamics and control (overview small signals models, example topology, transfer functions). Key skill which can be applied broadly.
- Energy storage and energy transfer components and magnetics (capacitive, inductive, uncoupled, coupled).
- Modern rectifiers (topologies, harmonics)
- High power resonant converters
- HVAC / HVDC Power systems and conversion basic understanding.
- Harmonics/Flicker/Reactive Power Control.
- Modelling of power converters.
- Low voltage ride-through (wind application)

**EE4408 - ASICS 2**

**ECTS Credits: 6**

**Electronics & Computer Engineering**

**Rationale and Purpose of the Module:** This module is a 4th year core module for BE in Electronic Engineering (LM070) students. This is a follow-on module from EE4407 (ASICs 1) which dealt with digital IC design issues. This follow-on module deals with analogue and mixed-signal IC design with an emphasis on the practice of theory and the use of IC CAD (Integrated Circuit Computer Aided Design) tools (analogue and mixed-signal IC design entry, simulation and layout CAD).

This module deals with the areas of design MOS circuit concepts, operational amplifiers, D/A converters, A/D converters, testability, ESD topics, plus assembly and packaging.

**Syllabus:** Basic electrical properties of MOS and CMOS

Sheet resistance Rs and resistor design in CMOS. Area capacitances of layers and capacitor design in CMOS. Choice of Layers.

Operational amplifier (op-amp) architectures, design parameters and transistor sizing. Trade-offs in design. Op-amp DC and AC operation.


Latch-up in circuits.


Static electricity & product quality. ESD (ElectroStatic discharge).


**EE4513**

Prerequisites: EE4512

Sheet resistance Rs and resistor design in CMOS. Area capacitances of layers and capacitor design in CMOS. Choice of Layers.

Operational amplifier (op-amp) architectures, design parameters and transistor sizing. Trade-offs in design. Op-amp DC and AC operation.


Latch-up in circuits.


Static electricity & product quality. ESD (ElectroStatic discharge).


**EE4514**

Prerequisites: EE4513


Static electricity & product quality. ESD (ElectroStatic discharge).


**EE4517**

Prerequisites: EE4514


Static electricity & product quality. ESD (ElectroStatic discharge).


**EE4518**

Prerequisites: EE4517


Static electricity & product quality. ESD (ElectroStatic discharge).

EE4617 - COMMUNICATION THEORY 1
ECTS Credits: 6
Electronics & 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 digital modulation & coding theory with reference to their increasingly wide application in present day digital communications and computer systems.

MULTIPLE ACCESS, TDMA, FDMA and CDMA. Synchronisation for digital systems, Carrier Recovery, Clock Recovery. Methods of bit and frame synchronisation, phase lock loops, early-late gate.
FUNDAMENTALS OF INFORMATION THEORY and the limits to information transmission: information source encoding theory and techniques, with examples in fax, voice and video compression. Communication channels: m-ary discrete memoryless channels, binary symmetric channels, equivocation, mutual information, and channel capacity. Shannon-Hartley theorem and the possibilities and limits to error free transmission.
CHANNEL CODING: error-detecting and error-correcting coding theory and techniques for random and burst error protection on communication channels. Interleaving principles. Type of error. Linear block coding, including LSBC, generator and PCM matrices, Standard Array and syndrome decoding; statistical decision theory and minimum distance-, maximum likelihood- and maximum a-posteriori- decoding theory and techniques; Perfect codes, Hamming codes, shortened Hamming codes and other examples. Cyclic codes and Convolution codes: theory and examples. Soft decision and hard decision detection. Viterbi decoding algorithm for convolution codes.

Prerequisites: EE4044

EE4816 - SIGNALS AND SYSTEMS 1
ECTS Credits: 6
Electronics & Computer Engineering

Rationale and Purpose of the Module: To introduce a number of mathematical and computer aided tools for analysing signals and systems in the time and frequency domains, such that students will develop a sound knowledge and understanding of linear transform theory for signal processing, and to apply it to correlation and filtering of signals, in analogue and digital domains.


School of Languages, Literature, Culture and Communication

Rationale and Purpose of the Module: The purpose of this module is to further develop the introduction of foundational skills to students of English literature, following on from Critical Practice 1, with a focus on Renaissance literature.

Syllabus: This module introduces students to genre-based studies in poetry and drama, in this case, to significant ideas and key works from the English Renaissance. The period studied, from the Reformation to the Restoration, sees the introduction into England both of new philosophies, such as humanism, and new literary forms, such as the sonnet. Therefore, the module aims to place the literature in those cultural, social, and political contexts which inform and affect its interpretation, and, through an account of the poetic and dramatic developments of the period, to equip students with the skills to identify and critically analyse poetic forms and dramatic conventions.

EH4006 - VICTORIAN TEXTS AND CONTEXTS
ECTS Credits: 6
School of Languages, Literature, Culture and Communication

Rationale and Purpose of the Module: This module aims to introduce students to key elements of nineteenth century literatures in English with a specific focus on Victorian and Edwardian texts and contexts. Students will examine a range of literary texts produced in the period and relate them to the political, social and historical circumstances in which they were written.

Syllabus: Addressing developments in literary practice and form, we will focus initially on the rise of the novel, and will also consider changes in the nature of author and audience during the second half of the nineteenth century. Nineteenth century aesthetic, political and social contexts for the literature will be central to our work and a range of theoretical approaches will be tested in relation to these categories. As part of this endeavour, students taking the module will be asked to participate in a group-based research project.

EH4008 - BRITISH LITERATURE SINCE 1945
ECTS Credits: 6
School of Languages, Literature, Culture and Communication

Rationale and Purpose of the Module: This module studies British literature from the end of the Second World War to the present day. Students will read a range of literary texts produced in the period and will contextualise them politically, socially and historically. Topics will include the impact of the Second World War and the concomitant erosion of the British Empire; the enduring legacy of modernist literary experimentalism in post-Second World War literature; the rise of various liberation movements, including women's and gay liberation and post-colonial challenges to notions of Britishness; the impact of literary theory and the emergence of postmodernism.

Syllabus: This module covers British literature from 1945-present. Writers will include major novelists of the period such as Jean Rhys, Doris Lessing, Margaret Drabble, A. S. Byatt, Salman Rushdie, Jeanette Winterson, Kazuo Ishiguro and Zadie Smith; poets such as Philip Larkin, Dylan Thomas, Derek Walcott, Geoffrey Hill and ted Hughes; and playwrights such as John Osborne, Joe Orton, Harold Pinter, Tom Stoppard, Caryl Churchill and Sarah Kane. To define the themes and interpret this literature, students will become familiar with political, social and historical contexts (the Second World War, various liberation movements, the rise and fall of the welfare state), with significant concepts and philosophies (Thatcherism, postmodernism), and with literary movements (Angry Young Men, Kitchen Sink Realism, New Brutalists).

EH4012 - RESTORATION AND AUGUSTAN LITERATURE
ECTS Credits: 6

School of Languages, Literature, Culture and Communication

Rationale and Purpose of the Module: The aim of this course is to provide students with a survey of the English literature of the period variously known as the Augustan Age, the long eighteenth century, and the Enlightenment in Britain and Ireland. Informing students of the various critical and historical methodologies which can be applied to later seventeenth and eighteenth-century writing, we will study changes in literary practice and form alongside changes in the nature of author and audience, paying close attention to the broad cultural transition in which the cynical, satirical, and sometimes highly sexualised literature of the Restoration period (1660-c1700) yielded to the gentler pastoral sensibilities of the middle of the eighteenth century. Along the way we will study utopian, libertarian and feminist impulses at work in the literature and thought of the Restoration and Augustan periods; we will also place these works in their global context, appreciating that this literature was produced on the cusp of the first substantial phase of Britain’s imperial expansion. The social history, philosophy, and literary forms of the period will be examined through a close study of selected texts.

EH4016 - STATE OF THE UNION: AMERICAN LITERATURE SINCE 1890
ECTS Credits: 6

School of Languages, Literature, Culture and Communication

Rationale and Purpose of the Module: This module follows chronologically from EH4145 American Literature, covering the period from the closing of the frontier to the present day. Through a selection of texts reflecting the diverse voices of the literature, students explore the physical, cultural and sociopolitical geographies of America. Reading accounts of the city and town, the urban and suburban, the road, the land, the reservation, or the South, students engage with questions of self and society, class and race, national identity, marginalisation, counterculturalism and globalisation, as expressed within differing literary movements.

Syllabus: This module covers American fiction, poetry and drama from 1890 to the present day, including works by, for example, Chopin, Wharton, Crane, Stein, Frost, Stevens, Pound, Eliot, O Neill, Cummings, Fitzgerald, Faulkner, Hemingway, Welty, Williams, Salinger, Kerouac, Heller, O Connor, Ginsberg, Plath, DeLillo, and Pynchon; African-American writing by Du Bois, Hurston, Hughes, Wright, Ellison, Baldwin, Morrison and Baraka; Asian-American writing by Mukherjee, Tan and Lahiri; Jewish-American writing by Singer, Malamud, Bellow, Miller, and Roth; Native American writing by Silko and Erdrich; literature after 9/11. In defining the themes and interpreting the literature of the period, attention is paid to political, social and cultural contexts (for example, the Great Depression, the World Wars, the Civil Rights Movement, the Vietnam War), to significant concepts and philosophies (for example, realism, naturalism, modernism, postmodernism), and to literary movements (for example, regional writing, the Lost Generation, the Harlem Renaissance, the Beat Generation).

EH4018 - CONTEMPORARY IRISH LITERATURE
ECTS Credits: 6

School of Languages, Literature, Culture and Communication

Rationale and Purpose of the Module: This module aims to introduce students to a range of Irish narrative texts written in English since 1980 and in doing so: Explore the engagement of these texts with contemporary historical, social and political contexts. Consider the contemporary writing of cultural and social identities in, and about, Ireland. Evaluate literary responses to the Northern Troubles and consider the ways in which literary/cultural constructions of Northern Ireland are reproduced at home and abroad. Examine the representation of community and political activism in Irish writing. Address the construction of gender and sexuality in contemporary Irish writing. Explore the writing of the Irish diaspora as well as that of its immigrant communities. Evaluate a range of theoretical approaches which have been, or might be, applied to this literature.

Syllabus: The period since 1980 has seen profound changes throughout the island of Ireland, particularly in the post-Robinson period. Drawing on the work of writers north and south, as well as those working within both the diaspora and immigrant communities in Ireland, students will consider how these texts have constructed and deconstructed the cultural, social and political landscape of contemporary Ireland.

EH4026 - COLONIAL/POSTCOLONIAL LITERATURE IN ENGLISH
Rationale and Purpose of the Module: On successful completion of this module, students will be able to apply a critical and cogent awareness of Colonial and postcolonial histories of the 19th and 20th centuries. Multiple socio-political and cultural contexts associated with Anglophone world literature. Key literary texts in the field of postcolonial studies from around the world. A sample of key theoretical debates in the field of postcolonial studies at large (connected to additional theoretical fields such as feminism, ecocriticism, postmodernism, and so on). Ways to compare, contrast and combine different theoretical and methodological positions in the field of postcolonial studies.

Syllabus: This module will examine colonial discourse of the British Empire, through a series of colonial and postcolonial literary and theoretical readings. More specifically, we will review the fundamental dichotomies of colonial discourse - master/slave, center/margins, enlightenment/barbarism, authenticity/hybrity, secular modernity/religious conservatism, nation/nativism - and will proceed to read articles and novels from the end of the 19th century, as well as 20th century, from India, Africa and the Caribbean, that both address and attempt to reconfigure the colonial experience from a variety of perspectives.

EH4038 - STUDY OF A MAJOR AUTHOR
ECTS Credits: 6

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 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 author. Students will study the authors development from early efforts to mature output and will be able to analyze and discuss the authors overall impact on literary history. Students will be able to position the author historically and politically and will understand the authors role as a contributor to intellectual history. Students will be able to position the author in different theoretical and methodological frameworks and will be able to assess and interpret a wide range of the authors work.

Example One: Virginia Woolf
This module will trace the development of the modernist novelist Virginia Woolf from early work to mature output. Students will read most of her major fictions as well as a selection of her essays and autobiographical pieces. Students will study Woolf as a theorist and practitioner of modernist narrative form, as a woman writer deeply interested in questions of female creativity and a significant contributor to feminist literary theory, and as a figure increasingly relevant to studies of memory and trauma. Students will also consider Woolf as a cultural icon by considering her work in relation to recent films and novels that deploy her work and life.

EH4125 - FEMINIST LITERARY THEORY
ECTS Credits: 6

Rationale and Purpose of the Module: To introduce students to a range of writing by women and to demonstrate how understandings of literature are marked by gender. To explore critical views of the institution of literature and to produce models of the reading and writing processes from a feminist perspective.

Syllabus: This course will combine feminist theory and the analysis of literary texts. We will consider five main areas of feminist theory and criticism: the concept of a feminine aesthetic; the contribution of psychoanalytic theory to understandings of gender, identity and writing; the relationship between a (racial) identity and gender in literature; questions of gender trouble and sexuality; and postmodern feminist perspectives as they apply to literary texts. Throughout the course, theoretical approaches will be tested in relation to a range of women’s writing. Primary texts will be drawn from English language traditions in the first instance, although writings from other language traditions may be included depending on staff expertise.
EN4126 - IMAGINED SPACES: IRISH CULTURAL TEXTS
ECTS Credits: 6
School of Languages, Literature, Culture and Communication

Rationale and Purpose of the Module: This module will explore cultural production in 20th-21st century Ireland, and interrogate the ways in which Ireland is produced, or constructed, in cultural and ideological texts. The module will focus in particular on changing definitions of Ireland and Irishness in the culture (literary and media) of the recent past.

Syllabus: The course will introduce students to a range of 20th-21st century Irish fiction and media texts, and address related issues in literary and film theory. The module aims to deepen students understanding of contemporary Irish culture in the following ways:

1. By addressing the relationship between contemporary Irish literature/media and the tradition of Irish writing and cultural production;
2. By providing an overview of the Irish media context with both theoretical and practice-based approaches.

Key issues will include: the myth of the West, urban Ireland, the Troubles in Irish culture, changes in gender roles, questions of language(s), in-migration and diaspora, Irelands Others (e.g. Traveller, minority ethnic, lesbian & gay, and transgender cultures).

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EN4006 - CURRICULUM STUDIES
ECTS Credits: 6
Education & Professional Studies

Rationale and Purpose of the Module: Aim To situate whole curriculum in its macro educational and political context and develop students understanding of key aspects of curriculum planning, development, reform, innovation and change.

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 relationship between curriculum and education policy; external influences on curriculum policy and policymaking; partnership approach; recent curriculum policy developments; core curriculum; the work of the NCCA and their proposals for senior cycle 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 e.g. ICT for teaching and learning; 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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EN4008 - TEACHER AS PROFESSIONAL
ECTS Credits: 6
Education & Professional Studies

Rationale and Purpose of the Module: Students will reflect on the collective meaning and purpose of education. Students will also synthesise the meaning of teacher professionalism and will deepen their analysis of their emergent identities as members of the teaching profession.

Syllabus: The historical context of teacher professionalism in Ireland; professionalism and professionalisation; models of professionalism; self-regulation; national policy impact on teacher professionalism e.g. Teaching Council Codes of Professional Conduct; professional accountability, competences; teacher professional development across the continuum (initial, induction, probation and continuous professional development); duty of care; teachers and personal, emotional and moral development; impact of international research and policy on teacher professionalism (OECD, PISA); social and personal education; holistic education and pastoral care; teacher agency; performativity; professional boundaries and partnership; external agencies; whole school context and child welfare.

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EN4014 - TECHNOLOGY AND SOCIETY
ECTS Credits: 3
Education & Professional Studies

Rationale and Purpose of the Module: Technology and Society is an important element in Junior and Leaving Certificate Technology. It enables students to explore the complex relationship between technology and society. As potential technologists it is important that students are made aware of the challenges posed by technology. This module provides students with an insight into what the relationship between technology and society is.

Syllabus: Lectures are designed to raise key issues that are explored in detail through the analysis of case studies that exemplify these issues in tutorials. Student work is guided by the Course workbook which also provides additional case studies to promote deeper reflection. Assessment takes the form of two short assignments to be completed while students are on Teaching Practice (TP) and a capstone essay on return from TP.

Prerequisites: EN4001, EN4002, EN4004, EN4003

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EP4003 - ENTREPRENEURSHIP AND INNOVATION
ECTS Credits: 6
Management and Marketing

Rationale and Purpose of the Module: The aim of the module is to help students to develop an entrepreneurial mindset that includes creativity, innovation and diagnostic abilities. The course focuses on entrepreneurship and innovation for new start-up businesses as well as entrepreneurial behaviour within larger organisations. Key objectives are to introduce students to the theory and practice of entrepreneurial creativity and innovation and to provide an understanding of the nature of entrepreneurship, the characteristics of the entrepreneur, the intrapreneur and the role of the socio-cultural and economic environment in fashioning innovative entrepreneurship. In addition the module examines the process of managing innovation.

Syllabus: This module commences with an introduction to the nature and development of entrepreneurship and emphasises the strong link between entrepreneurship and innovation. This leads to an overview of the schools of thought on entrepreneurship and an understanding of the entrepreneur and the entrepreneurial process. Creativity and innovation are examined with contextual
emphasis on innovation in products, services and processes; product strategy, and new product/service development. Corporate entrepreneurship is explored and creative thinking is applied to identify venture opportunities, business planning, networking and technology transfer.

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**ER4404 - MANAGING THE ENVIRONMENT**

**ECTS Credits: 6**

**Chemical & Environmental Sciences**

**Rationale and Purpose of the Module:** To introduce the student to the key areas of environmental management, integrated pollution prevention control and health & safety systems in the workplace.

To develop the students' understanding of the inter-relationship of these areas and their usefulness as tools for managing environmental and occupational safety performance within a company.

**Syllabus:** Structure of the atmosphere; insolation; general circulation models; global climatic zones; mid-latitude weather and climate; stability, cloud formation and precipitation; causes and effects of polar vortices; climatic change in past and predicted future; natural and anthropogenic causes of climate change; groundwater formation, distribution, uses, causes of pollution; vulnerability to pollution; remote sensing: energy sources, emittance and reflection, impacts of atmospheric transmission on electromagnetic radiation; spectral reflectance; data capture and interpretation; application of remote sensed data; Geographical Information Systems: methods and applications.

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**ER4405 - CONSERVATION ECOLOGY**

**ECTS Credits: 6**

**Chemical & Environmental 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 æbiodiversityÆ 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. To review case studies in the management of conservation areas, and habitat restoration.

**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.

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**ER4408 - ENVIRONMENTAL MANAGEMENT 2**

**ECTS Credits: 6**

**Chemical & Environmental Sciences**

**Rationale and Purpose of the Module:** This module provides a synthesis of contemporary developments in environmental management designed to equip students with an understanding of the context in which knowledge and skills developed in other modules interfaces with environmental policy development at scales from global to local. It is therefore both a broadening of their academic understanding and a vocation-orientated roadmap.

**Syllabus:** Contemporary attitudes to the environment; sustainability definitions and metrics; environmental management at international scale: impact of globalisation (World Bank, NGOs, WTO), United Nations...
protocols (Montreal, Kyoto); European Union (EU) treaties, policy drivers and principles for sustainable development, evaluation of selected environment Directives, EU future policies; national level environmental management with special reference to Ireland: evaluation of available approaches and instruments; regional scale environmental management: the advantages, evaluation of industrial ecology principles and Local Agenda 21.

**ER4508 - POLLUTION CONTROL 2 (WASTE MANAGEMENT)**
ECTS Credits: 6

Chemical & Environmental Sciences

**Rationale and Purpose of the Module:** To provide an understanding of current waste management options, their benefits and associated problems, and their place in the hierarchy of waste management.

To provide an understanding of the science and technology underlying solid waste management including the problems encountered.

To provide an understanding of the locational issues for different types of waste processing plants, including the NIMBY Syndrome.

To provide an understanding of the technology of waste to energy systems.


**ET4004 - TCP / IP NETWORKING**
ECTS Credits: 6

Electronics & Computer Engineering

**Rationale and Purpose of the Module:** The aim of this module is to provide a detailed study of the TCP/IP model and the internet. The module also covers advanced topics in multimedia communications.

**Syllabus:** The internet and TCP/IP model: Evolution of internet; TCP/IP model (layers description and functions, PDU encapsulation, protocol architecture); TCP/IP interworking principles.

Network layer: Internet protocol (IP) mobile IP, addressing (IPv4 vs. IPv6); NAT operation (static vs. dynamic); subnetting and superhetting; address resolution with ARP and RARP; routing protocols (RIP, OSPF, BGP), Quality of Service (DiffServ vs. IntServ); control and assistance mechanisms (ICMP); internet multicasting (MBone operation) and group management (IGMP)

Transport layer; Unreliable datagram transport with UDP; real-time transport with RTP and RTCP; reliable connection-oriented transport with TCP and SCTP; wireless TCP.

Application layer: Review of client-server model; domain name system (DNS); TCP/IP configuration; static (BOOTP) vs. dynamic (DHCP); terminal networking with Telnet; file transfer with FTP and TFTP; email service (SMTP, POP, IMAP); browsing with HTTP; network management with SNMP, Multimedia communications; streaming audio, internet radio, VoIP (SIP v H323), video on demand, IPTV.

**ER4006 - CLEAN TECHNOLOGY**
ECTS Credits: 6

Chemical & Environmental Sciences

**Rationale and Purpose of the Module:** To provide an introduction to the concept of clean technology.

To survey methods of recycling, reducing or removing gaseous or aqueous waste from industrial processes using a clean technology approach.

**Syllabus:** Introduction to clean technology. Examples of Clean Technology in the agricultural industry, agrochemical, fine chemical and pharmaceutical industry. Role of catalysts, reactor configuration and design, Elimination of emissions from material handling and storage, Control of fugitive emissions, Use of biotechnology.

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

Electronics & 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.
Rationale and Purpose of the Module: To introduce the concept of security services such as authentication, integrity and confidentiality. To introduce the role of digital signatures and their implementation using cryptographic ciphers. To introduce basic security protocols that provide security services. Attacks against security services: Replay attack, man in the middle attack.

Syllabus: [Introduction to Security Services:] Security attacks, OSI model, security services: concepts of confidentiality, data origin authentication, entity authentication, data-integrity, access control, availability. [Digital Signatures:] The role of signatures, MACs, Hash functions, digital signatures, public key certificates, X509 certification authorities, e-mail security: PGP. [Security Protocols:] Introduction to key management, peer-to-peer distribution protocols and identification protocols. Secure web (https/ssl), secure shell (ssh) etc. [Identification techniques:] Identification tokens and smart cards. Biometric identification: finger prints, retina scan, face recognition, voice recognition. [Attacks:] Definition of attacker and capabilities of attacker, introduction to attacks on protocols, such as replay attacks, man in the middle attack.

ET4027 - COMPUTER FORENSICS
ECTS Credits: 6
Electronics & Computer Engineering

Rationale and Purpose of the Module: This module aims to give the student a firm understanding of the problems associated with computer forensics in relation to data recovery from digital media, whether the data was accidentally lost or deliberately destroyed. The student will learn to extract information from a computer which might be of relevance at a crime-scene using a variety of forensic techniques, tools and commands.

Syllabus: Computer Forensics: Definition; Evolution of Computer Forensics; Need for Computer Forensics in the digital age. File systems: Disk technologies; Data organisation; File systems on Unix and Windows. Data recovery: Recovering data and analysing data usage patterns: the Audit Trail; Use of caches, spooling, paging files, logs, backup media, computer memory (while still powered). Tools for forensic analysis: Laboratory/project based: file system analysis tools; investigate a case study forensic problem; emphasis on the use of tools.

ET4014 - DATA SECURITY
ECTS Credits: 6
Electronics & Computer Engineering

Rationale and Purpose of the Module: To introduce basic security protocols that provide security services. Attacks against security services: Replay attack, man in the middle attack.


ET4018 - MOBILE AND WIRELESS COMMUNICATIONS
ECTS Credits: 6
Electronics & Computer Engineering

Rationale and Purpose of the Module: The aim of this module is to provide an introduction to mobile communications and mobile networking. At the completion of the module, students should have an understanding of the important issues in providing a mobile communications system including signal transmission, network management and interaction with a fixed network. Students should understand the principles of operation of a current mobile communications system and the potential for future services development.

Electronics & Computer Engineering

Rationale and Purpose of the Module: This module provides the necessary understanding, knowledge and skills for students to undertake a career in Energy Management. This module will be a direct replacement for ET4048 /ET4068 Electronic Systems for the Built Environment 2 on LM080 and LM087.


Prerequisites: ET4141

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

Electronics & 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

Prerequisites: ET4151

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ET4204 - ANALOGUE ELECTRONICS 4
ECTS Credits: 6

Electronics & Computer Engineering

Rationale and Purpose of the Module: The aim of this module is to introduce the structure and uses of the operational amplifier for a range of electronic voltage signal conditioning and instrumentation applications.

Syllabus: simple DC circuit theorems and analyse AC circuits using both the phasor approach and the complex notation approach.


Prerequisites: ET4141
Syllabus: Operational amplifier structure. Operational amplifier behaviour: ideal and real

Prerequisites: ET4224

ET4224 - ROBOTICS 1: SENSORS AND ACTUATORS
ECTS Credits: 6

Electronics & Computer Engineering

Rationale and Purpose of the Module: This module introduces students to fundamental principles of
* Measurement of physical phenomena utilising various sensing techniques.
* Transducer action and signal conversion.
* Various Actuator types and principles of operation.
* Specification of a complete measurement system.

Syllabus: Introduction to Physical Phenomenon:
* SI Units.
* Principles of sensor operation (mechanical, thermal, sound, light).
Sensors and Transducers:
* Concept of transducer action as signal conversion with particular emphasis on an electrical signal as the output.
* The ideal transducer.
* Resolution, accuracy, linearity definitions and relevance.
* Review of some physical phenomena that result in electrical parameter variations
Actuators
* Magneto Motive Force & magnetic circuits, transformers, DC generators and motors.
* Motors: DC machines with permanent magnet and field windings, Induction motors, Stepper Motors, Stepper drives.
* Motor Drive Circuits.

Sensor Interfacing Circuitry introduction/review
* Review of Op-Amp as applied to sensing systems, Instrumentation amplifiers, diff amps, etc. Simple DACs, ADCs successive approximation and integrating, operating principles and suitability for industrial applications. Overall concepts of accuracy, drift, resolution, and common mode rejection applied to a measurement system, complete system composed of a transducer, amplifier and ADC.

Prerequisites: EE4102, EE4313, EE4101

ET4243 - WEB AND DATABASE TECHNOLOGY 2
ECTS Credits: 6

Electronics & Computer Engineering

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

EV4012 - EQUINE ANATOMY AND PHYSIOLOGY
ECTS Credits: 6

Life Sciences

Rationale and Purpose of the Module: To introduce students to fundamental concepts of Equine Anatomy and Physiology.
Syllabus: The anatomy of the horse] to be discussed with reference to musculoskeletal structure and organs. [The main systems of the horse; digestive, respiratory, circulatory (including lymphatics); reproductive (including embryology and physiology of reproduction); urinary; nervous and immune]. [Consideration of the theoretical background to the use and operation of modern diagnostic/treatment equipment] such as X-ray, ECG, ultrasound, laser and fibre optic based devices.

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**EV4013 - EQUINE PHYSIOLOGY**  
ECTS Credits: 6  

**Life Sciences**

**Rationale and Purpose of the Module:** This module builds on the previous modules BY4001, BY4002, BC4902 and EV4012 and forms a core module on the Equine Science Degree programme.

**Syllabus:** Integrating the students prior knowledge, and valuing a quantitative approach, this module leads to an advanced understanding of mammalian body systems, exemplified by equine performance and dysfunction. The systems to be studied include:
- Blood circulation and the cardiovascular system.
- Respiration.
- Water balance and excretion including renal function and urine formation.
- Gastrointestinal function.
- The nervous system: central, autonomic.
- Special senses.
- Temperature regulation.
- Skeletal muscle.
- Endocrinology and metabolism.
- Reproduction and lactation.

**Prerequisites:** BY4002, EV4012, BC4902, BY4001

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**EV4014 - EQUINE NUTRITION**  
ECTS Credits: 6  

**Life Sciences**

**Rationale and Purpose of the Module:** The purpose of this module is to provide students with an understanding of the scientific principles of Equine Nutrition and how these relate to the practical applications of feeding.

**Syllabus:** Classification, digestion, absorption and metabolism of carbohydrates, protein and lipids; Amylose and amylopectin; Utilisation of the products of dietary energy and protein; Glycemic response, insulin production, insulin resistance and hyperinsulinemia; microbial fermentation, manipulation of fermentation; VFA absorption; VFA efficiency, lactic acid production, Feed digestibility including aspects on apparent and true digestibility; Transit and retention times, Protein degradation and amino acid absorption; NPN and N utilisation, FFAs; NEFAs; Water; water requirements; Appetite; Feeding standards, Metabolic body size and intake; Feed energy systems, Partition of dietary energy for horses, an evaluation DE and NE systems; energy and protein requirements based on UFC and MACD; heat increment; Efficiency of utilisation of ME; A critical review and evaluation of feeding experiments, and nutrient balance studies; Dietary electrolyte balance; Feeding for performance and metabolism of nutrients during exercise, Applied equine nutrition including aspects on nutrient requirements and utilisation during periods of for growth and production (lactation, gestation). An overview of dietary related problems; Application of current equine nutritional research;

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**EV4015 - EQUINE HEALTH AND DISEASE**  
ECTS Credits: 6  

**Life Sciences**

**Rationale and Purpose of the Module:** To acquaint students with the physical appearance and behaviour of the healthy horse so that signs of ill health and disease are recognised at an early stage, thus enabling them to make informed decisions about the necessity for veterinary intervention. To acquaint students with disease conditions of toxicologic origin and with the causes, management and prevention of infectious diseases.

**Syllabus:** To acquaint students with the physical appearance and behaviour of the healthy horse so that signs of ill health and disease are recognised at an early stage, thus enabling them to make informed decisions about the necessity for veterinary intervention. To acquaint students with disease conditions of toxicologic origin and with the causes, management and prevention of infectious diseases. Topics covered include parasitic, bacterial and viral diseases of the horse. Diseases of metabolic and degenerative origin are also discussed, including degenerative orthopaedic diseases and osteoarthritis. Disease conditions of the airways and their impact on athletic performance of the horse are discussed from the perspectives of contributing environmental factors and prevention.

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**EV4017 - EQUINE PHARMACOLOGY**  
ECTS Credits: 6  

**Life Sciences**

**Rationale and Purpose of the Module:** To acquaint students with the classes of drugs which are of relevance to equine medicine and to provide an insight to the factors that determine species differences in drug response.

**Syllabus:** To acquaint students with the classes of drugs which are of relevance to equine medicine and to provide an insight to the factors that determine species differences in drug response. Classification of drugs and sources of information on drugs. Drug dosage forms and routes of administration. Processes of drug absorption, distribution, metabolism and excretion. Basic principles of pharmacokinetics. Pharmacological effects, mechanism of action and fate of therapeutic agents that affect various systems of the body (equine), with particular emphasis on drugs affecting the musculoskeletal and respiratory systems; Antimicrobial drugs; Non-steroidal anti-inflammatory drugs; Anthelmintic medication; Applied toxicology; Drug assay methodology; Drug licensing, registration and legislation. Performance enhancing drugs, mechanism of action and current legislation; Doping, current doping problems in the equine industry; international trends; diagnostic assays and their sensitivities.

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**EV4024 - EQUINE REPRODUCTION**  
ECTS Credits: 6  

**Life Sciences**

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**EV4032 - THE HORSE INDUSTRY**  
ECTS Credits: 6  

**Life Sciences**

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EY4014 - SUBJECT PEDAGOGICS 1 (ENGLISH)
ECTS Credits: 6

Education & Professional Studies

Rationale and Purpose of the Module: 1. Students will be introduced to the principles and practices of teaching English in second level schools.
2. Students will be enabled to understand the concepts and methodologies outlined in the Junior Cycle English Syllabi.

Syllabus: The syllabus will be structured around key concepts in teaching English at Junior Cycle, i.e., reading, writing, speaking and listening in the three domains of personal literacy, social literacy, and cultural literacy.

Prerequisites: EY4016

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EY4016 - SUBJECT PEDAGOGICS 2 (ENGLISH)
ECTS Credits: 6

Education & Professional Studies

Rationale and Purpose of the Module: 1. Students will be introduced to the principles and practices of teaching English in second level schools.
2. Students will be enabled to understand the concepts and methodologies outlined in Senior Cycle English Syllabi.

Syllabus: The syllabus will be structured around key concepts in teaching English, i.e., the development of comprehending and composing in the language categories of information, argument, persuasion, narrative, and the aesthetic use of language. It will be premised on the concepts of critical literacy and language awareness.

Prerequisites: EY4014

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EY4034 - SUBJECT PEDAGOGICS 1 (GEOGRAPHY)
ECTS Credits: 6

Education & Professional Studies

Rationale and Purpose of the Module: (i) To review key aspects of contemporary Francophone societies; (ii) to continue to develop students receptive and active language skills; (iii) to consolidate students' knowledge of French grammar; (iv) to reinforce students' awareness of issues related to the evolution of the French language and in particular regional varieties and la Francophonie; (v) to promote students' reading and analytical skills in the study of French literature.

Syllabus: Students are introduced in lectures to the study of social, historical, linguistic, and literary aspects of France and francophone societies. Themes presented this semester are (i) decolonisation and the variety of francophone communities; (ii) the search for identity in modern literature; (iii) la Francophonie and regional varieties of language. Tutorials explore these subjects and students' reading and writing skills are improved through regular exercises. Particular attention is paid to oral and aural skills in French which are developed through the discussion of a broad selection of contemporary oral and written texts from diverse media. Students continue to review issues related to French grammar.

Prerequisites: FR4141

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FR4146 - FRENCH LANGUAGE AND SOCIETY 4
MODERN CONTEMPORARY
ECTS Credits: 6

School of Languages, Literature, Culture and Communication

Rationale and Purpose of the Module: This module is an introduction to contemporary social, economic, and political life in France. This is achieved by developing students' knowledge of French culture and society by focusing on the country's cultural, social, and political aspects, by encouraging team-work and intercultural understanding.

Syllabus: The 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 lectures, students are introduced to analytic tools to study particular social political and culture aspects. In the tutorials, analysis work of newspaper articles is undertaken making students aware of the vital link between culture and language learning. In short, The module is centred on a series of lectures analysing the major issues in French politics, economics...
and society from 1945 to the present. Language tutorials review some of the points raised in the lectures through close reading and discussion of authentic texts related to the lectures. Language tutorials also endeavour to develop written skills in the French language through translation and/or essay writing. Tutorial are also devoted to the study of a literary text closely related to the subject matter.

Prerequisites: FR4143

FR4418 - FRENCH LANGUAGE AND SOCIETY 6
MEDIA/CURRENT ISSUES
ECTS Credits: 6

School of Languages, Literature, Culture and Communication

Rationale and Purpose of the Module: The purpose of this module is to give students an overview of the French media industries and the ability to evaluate their functions. This is achieved by:
- the study of the relationship between the media and the state
- in depth analysis of different branches of the media
- practice in using the language of the media and in analysis particular media artefacts.

Syllabus: This module has three parts, each dedicated to particular aim of the module.
A general lecture will cover topics on the role of the media, the role of the state, the particularity of the French press, the development of French cinema from its beginnings to the present day. There will be a translation class and a two hour seminar in which three films will be studied as set texts and in which students will be prepared for their final oral examination.

Prerequisites: FR4147

FR4424 - FRENCH LANGUAGE, CULTURE AND SOCIETY 2A
ECTS Credits: 6

School of Languages, Literature, Culture and Communication

Rationale and Purpose of the Module: (i) To provide students with an introduction to major aspects of contemporary Francophone societies and cultures; (ii) to familiarise students to issues related to the evolution of the French language particularly its regional varieties and la Francophonie worldwide; (iii) to promote students reading and analytical skills in the study of French literature; (iv) to give a solid grounding to a number of points of French Grammar.
(v) to further develop students practical language skills (oral and written).

Syllabus: Students are introduced in lectures to the study of social, historical, linguistic and literary aspects of France and francophone societies. Themes explored this semester are:
(i) decolonisation and the variety of francophone communities
(ii) the search for identity in modern literature
(iii) la Francophonie and regional varieties of 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. The study of French grammar in semester 1 is continued.

Prerequisites: FR4241

FR4448 - FRENCH LANGUAGE CULTURE AND SOCIETY 6
ECTS Credits: 6

School of Languages, Literature, Culture and Communication

Rationale and Purpose of the Module: The purpose of this module is to give students an overview of the French media industries and the ability to critically evaluate their functions; (ii) to enable students to improve written and oral language skills; (iii) to provide an understanding of the principles of bilateral interpreting and introductory practice; (iv) to give students practice in translating a variety of texts and to familiarise them with the appropriate translation strategies.

Syllabus: (i) Communication and the media in France - the study of the relationship between the media and the state; analysis of different branches of the media; practice in using the language of the media and in analysing particular media artefacts. (ii) Work on video documents on current issues in francophone countries to improve comprehension and oral skills. (iii) Translation of journalistic texts from French to English in the light of translation theory in order to foster the development of transferable translation strategies. (iv) Principles and practice in bi-lateral interpreting.

Prerequisites: FR4427

FR4622 - LITERATURE AND CULTURE 2:
TWENTIETH-CENTURY LITERATURE IN FRANCE
ECTS Credits: 6

School of Languages, Literature, Culture and Communication

Rationale and Purpose of the Module: To develop students’ knowledge of twentieth-century literature from a variety of critical perspectives.

To enable students to apply critical skills to the study of recent literature in French.

To develop students’ skills in communicating ideas in oral and written French.

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.

FR4626 - FRENCH LITERATURE AND CULTURE 4
19TH CENTURY ART
ECTS Credits: 6

School of Languages, Literature, Culture and Communication

Rationale and Purpose of the Module: To provide students with the means to recognise and evaluate the links between art and society in 19th century France. This is achieved by:
- giving an overview of the political, economic and cultural development of France from the revolution to circa 1880
- studying selected poems from mid century onwards
- analysing French painting particularly the realism/impressionist tradition
- reading and studying a selected realist/naturalist novel
Syllabus: The module is structured around a lecture and tutorials. The lecture will cover aspects of the development of France as well as introducing students to the study and appreciation of painting in the period. The tutorials will concentrate on textual analysis of the poetry and the novels.

FR4628 - FRENCH LITERATURE AND CULTURE 6: MODERNITY AND GENRE; THE NOVEL IN FRENCH
ECTS Credits: 6

School of Languages, Literature, Culture and Communication

Rationale and Purpose of the Module: This module offers a thorough discussion of the question of literary genre and cultural modernity & with particular reference to the novel genre in French over a period of four centuries. In so doing, it builds upon the pre-existing knowledge of students who have been exposed to a number of examples of the genre in preceding modules, while synthesising across the historical scope of their prior exposure to French literary and cultural artefacts. It consolidates the linguistic work done in earlier modules through a challenging exposure to works of a certain difficulty and length, deepening studentsÆ practices of both reading and responding to major cultural artefacts in the target (French) language.

Syllabus: The module seeks to foster a sense of the long-term in cultural and literary developments. Hence the inclusion of texts spanning four centuries (17th, 18th, 19th and 20th). Elements of context will be provided, through the inclusion of reference to wider historical development, social and cultural theory, and to the parallel and related development of other literary genres. Secondary reading will be duly circumscribed with emphasis being placed on thorough and close readings of the individual works. This emphasis will be replicated in the forms of assessment adopted. Students will be required to give an analytical presentation in the target language of an agreed extract (close reading and linguistic skills). Assessment will also include an extended synthetic essay in the target language (argumentational and linguistic skills).

FR4808 - FRENCH LANGUAGE AND LITERATURE 1
ECTS Credits: 6

Syllabus: The module is structured around a lecture and tutorials. The lecture will cover aspects of the development of France as well as introducing students to the study and appreciation of painting in the period. The tutorials will concentrate on textual analysis of the poetry and the novels.

School of Languages, Literature, Culture and Communication

Rationale and Purpose of the Module: To provide students with the means to recognise and evaluate the links between art and society in 19th century France. This is achieved by: - giving an overview of the political, economic and cultural development of France from the revolution to circa 1880 - studying selected poems from mid century onwards - analysing French painting, particularly the realist/impressionist tradition - reading and studying a selected realist/naturalist novel.

Syllabus: The module is structured around a lecture and tutorials. The lecture will cover aspects of the development of France as well as introducing students to the study and appreciation of painting in the period. The tutorials will concentrate on textual analysis of the poetry and the novels.

FR4922 - FRENCH FOR BUSINESS 2A
ECTS Credits: 6

School of Languages, Literature, Culture and Communication

Rationale and Purpose of the Module: (i) To consolidate and expand students Business French acquired in Semester one; (ii) to provide students with an understanding of key aspects of contemporary Francophone societies; (iii) to further develop practical language skills (receptive and active); (iv) to develop students appreciation of French literature; (v) to extend students knowledge of French grammar

Syllabus: Students are introduced to the detailed study of social, historical, linguistic and literary aspects of France and la Francophonie. Themes presented this semester are (i) decolonisation and the variety of francophone communities (ii) the search for identity in modern literature and (iii) la Francophonie and regional varieties of language. Oral and aural skills in French are further improved 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: finance, accounts, and investments. Students also study a literary text related to one of the lecture themes. The study of French grammar -in semester 1- is continued.

Prerequisites: FR4921

FR4924 - FRENCH FOR BUSINESS 4A
ECTS Credits: 6

School of Languages, Literature, Culture and Communication

Rationale and Purpose of the Module: To extend within a French business context studentsÆ reading, speaking, writing and listening skills already practised in the previous terms of university study. This is achieved: by revising and increasing studentsÆ knowledge of French vocabulary and grammar by familiarizing them with new aspects of French society and culture; by introducing students to Business French relevant to their future professional needs

Syllabus: The French for Business 4 module provides students with the space to expand their knowledge and language skills. Using authentic material, students are asked to perform in a simulated business environment a variety of tasks encountered in specific situations -Focus area: Corporate culture (workers and their workplace, internal communication, time management). In addition students make short oral presentations in the target language on selected French social/ cultural issues. Students also study a literary text related to the area of study currently "Les mains sales" by Jean-Paul Sartre.

FR4928b - FRENCH FOR BUSINESS 8A
ECTS Credits: 6

School of Languages, Literature, Culture and Communication

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 relating to contemporary French -society and issues.
Syllabus: The French for Business 8 module provides students with a language rich environment to further their knowledge and increase their confidence. In the lecture, students gain an insight into contemporary French society. The political situation and recent cultural, economic and social developments in France are examined. In the tutorials, students conduct research and complete a task based Internet project on a French city that they know from their Erasmus/Coop placement experience- identifying and analysing a number of political, economic, social, or cultural issues. Finally, students study a literary text related to the module title, currently ÔJournal du dehorsô by Annie Ernaux.

Prerequisites: FR4927

FT4204 - FOOD CHEMISTRY
ECTS Credits: 6

Life Sciences

Rationale and Purpose of the Module: To introduce students to the utilisation of raw materials by the food industry
To provide a general course on the chemistry of raw materials and of foods


FT4408 - PROJECT 2 FOOD TECHNOLOGY
ECTS Credits: 6

Life Sciences

Rationale and Purpose of the Module: To provide the student with the opportunity to carry out research To enable the student to develop a specialist understanding of a chosen topic

Syllabus: The project is of two semesters duration through the final academic year. Normally the student will select a single project subject, which may be pertinent to a problem encountered during his industrial training. It may involve practical work or may be of the nature of a design or feasibility study. In certain cases a student may be allowed to research an entrepreneurial activity, and if there is a scientific basis to the enterprise, then this kind of project will be encouraged.

FT4428 - ADVANCED FOOD CHEMISTRY
ECTS Credits: 6

Life Sciences

Rationale and Purpose of the Module: To provide an advanced course in Food Chemistry
To develop a comprehensive understanding of the relationships between food characteristics and their molecular basis.


FT4438 - FOOD MICROBIOLOGY
ECTS Credits: 3

Life Sciences

Rationale and Purpose of the Module: To provide a specialised course on the microbiology of foods.

Syllabus: Roles of major families of microorganisms in food preservation/spoilage, food fermentations and public health. Isolation and characterisation. Physiological characteristics of selected food microbes. Microbial testing and control in food products. Advanced detection methods. Hygiene, cleaning and disinfection in the food factory. HACCP and Quality Systems. Foodborne pathogens of current concern including Listeria monocytogenes, psychrophilic C. botulinum, Aeromonas, Yersinia, Bacillus cereus, Salmonella etc.

FT4458 - FOOD PRODUCTION SYSTEMS
ECTS Credits: 3

Life Sciences

Rationale and Purpose of the Module: To give students a general understanding of agricultural production in Ireland. To give students an appreciation of the factors influencing the production of novel crops and their subsequent utilisation.

Syllabus: [Soils and plant nutrition]; soil composition, physical chemical and biological properties. [Fertiliser use]. [Production of conventional and novel crops including crops for biomass use]. [Grassland and grazing], grazing systems, grass conservation. [Milk and meat production], rearing and management of cattle, sheep and pigs, production systems. [Effects of production methods on post-harvest and processing quality].

FT4468 - FOOD BIOTECHNOLOGY
ECTS Credits: 6

Life Sciences

Rationale and Purpose of the Module: To introduce students to the basic concepts of Food Biotechnology. To develop an understanding of the enabling technologies used to manipulate micro-organisms, plants and animals for the production of food.
**GA4105 - IRISH LANGUAGE 1**  
*ECTS Credits: 6*

**School of Languages, Literature, 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's Common European Framework of Reference for Languages. Those who complete modules GA4115 and GA4116 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 see course tutor if you would like more details.

**Lectures / Léachtai:**

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 ancestor through 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.

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**GA4116 - IRISH LANGUAGE 2**  
*ECTS Credits: 6*

**School of Languages, Literature, Culture and Communication**

**Rationale and Purpose of the Module:** The course aims to build on the language skills acquired in module GA4115. It introduces students to the study of Irish placenames and surnames. 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 acquired in GA4115.*

* To equip the student with basic writing skills.*

**Syllabus:** Language element: This is a continuation course. Topics covered include: Matters of work, food and drink, sickness and injury, clothes and shopping, holidays and travel, orders and making arrangements. Gaeltacht regions and certain dialect features will be discussed and some of the many Irish-language materials and resources now 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's Common European Framework of Reference for Languages. Those who complete modules GA4115 and GA4116 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 see course tutor if you would like more details.

**Lectures / Léachtai:**

Lecture topics to be covered include: Placenames, an understanding of the factors involved in their creation, the people who made them and the purposes they serve, the classification of placenames, ball choir mar logainmneacha, pagan/Christian associations of placenames, toponyms of sea-side and island areas, case-study of the Aran Islands, the most common Irish surnames, the surnames of County Limerick, the
influence of invasion on Irish surnames, how surnames evolved / changed, genealogical sources for tracing Irish ancestors, the genealogy market, some prominent Irish families e.g. the O’Malley’s, Granuaile.

Prerequisites: GA4115

GA4138 - LITRIÓCHT AGUS SAÍOCHT 4: SCRÍBHNEOIRÍ NA GAELTACHTA
ECTS Credits: 6

School of Languages, Literature, Culture, and Communication

Rationale and Purpose of the Module: Go bhforbrófaí teagmháil an mhic léinn le litriocht na Gaeilge dúchais; go léifeadh an mac léinn na mórshaothair litriocht a scríobh údair de chuid na Gaeltachta, agus go gcuireadh sé aithne ar litriocht chomhaimseartha na gceantar éagsúil seo idir phhrs., dhírbheathaisnéisí, filíocht, amhránaíocht agus ábhar lighnitéithe eile.

Syllabus: Saothar roghnaithe de chuid na litriochta comhaimseartha a scriobhadh sa Ghaeltacht; prós, filíocht, aistí ar chúrsaí comhaimseartha a scríobhadh sa Ghaeltacht, duchas litriochta na Gaeilge sa lá atá inniu ann. Leabhair agus ailt roghnaithe de chuid na litriochta acheaptaí na Gaeilge a dhéanamh in Éirinn agus i mBéarla.

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GA4228 - IRISH FOLKLORE II
ECTS Credits: 6

School of Languages, Literature, Culture, and Communication

Rationale and Purpose of the Module: The purpose of the module is to provide the student with an introduction to research in Folklore and Ethnology in either Irish or English, taught on a one-to-one basis and by embarking on an extended research project.

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.

GE4141 - GERMAN LANGUAGE AND SOCIETY 1: INTRO GERMAN STUD 1
ECTS Credits: 6

School of Languages, Literature, Culture and Communication

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 its evolution and changes. 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 topics discussed in the lecture while at the same time introducing reading techniques, principles of textual analysis and text discussion in oral and written form; b) contrastive grammar work continued. Language laboratory: exercises in pronunciation, listening comprehension and grammar utilizing CALL facilities.

Prerequisites: GE4141

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GE4146 - GERMAN LANGUAGE AND SOCIETY 4: GERMANY PAST AND PRESENT
ECTS Credits: 6

School of Languages, Literature, Culture and Communication

Rationale and Purpose of the Module: To enhance students’ knowledge about present day Germany by exploring the historical background of cultural life in Germany today. To further develop writing skills and reading comprehension at advanced level. To further develop students’ skills in the analysis of more complex literary texts in German. To consolidate grammatical structures at an appropriate level.

Syllabus: Lecture: German revolutions, democracy, fascism; cultural institutions, cultural life; the cultural and literary heritage. Tutorials: a) reading and discussion texts supporting the lecture; conversation class b) literature class: exploration of the myths and their significance in German literary, cultural and political history and in Germany today; c) advanced grammar work.

Prerequisites: GE4143

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School of Languages, Literature, Culture and Communication

Rationale and Purpose of the Module: To introduce further basic grammatical structures/functions and consolidate those covered in previous module.

Syllabus: Lecture: Postwar German-speaking countries: society and institutions; political, economic, cultural and literary trends; contemporary literature and culture in the German-speaking countries of Europe. Tutorial work: one hour textwork develops skills relating to textual analysis, grammar in use and writing, literary texts relating to lectures will also be discussed in this class and examined in the oral and written exams; one hour grammar/translation class English/German with a particular focus on the problem of registers.

Prerequisites: GE4211

GE4242 - GERMAN LANGUAGE, CULTURE AND SOCIETY 2A
ECTS Credits: 6

School of Languages, Literature, Culture and Communication

Rationale and Purpose of the Module: To further develop writing and oral skills as well as reading comprehension at advanced level. To consolidate grammatical structures at advanced level. To continue improvement of text analysis and oral, reading and writing skills, to revise problem areas in German grammar and introduce selected new or more complex grammatical and syntactic structures. To introduce the systematic study of translation theory and practice, to introduce students to a range of text-types and registers.

Syllabus: Lecture: German revolutions, democracy, fascism; cultural institutions, cultural life; the cultural and literary heritage. Tutorial work: Oral presentation & discussion class: drawing on text and audio-visual materials to develop formal oral skills (note-taking, structuring presentations, summarising and reporting content); Literary text analysis & production; Translation theory and practice: historical and socio-political texts

Prerequisites: GE4211

GE4248 - GERMAN LANGUAGE CULTURE AND SOCIETY 6
ECTS Credits: 6

School of Languages, Literature, Culture and Communication

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/equivalents.
structures. To continue the systematic study of translation theory and practice, introducing students to a range of text-types and registers.

**Syllabus:** Lecture: cultural, economic and political issues in unified Germany, Austria and Switzerland; dealing with the past; nationalism and national identity; economic, cultural and social debates (also with regard to the EU); equality, environmentalism, cultural politics, social reforms, migration.

Tutorial work: Oral presentation & discussion class: drawing on text and audio-visual materials to develop formal oral skills (presentations, talks, interviews). Text analysis & production: analysis & writing of project proposals, evaluations, etc.; Translation theory and practice: advertising, commercial and literary texts. This hour will be combined with a class providing an introduction to interpreting

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**GE4622 - GERMAN LITERATURE AND CULTURE 2:**

**ECTS Credits:** 6

**School of Languages, Literature, Culture and Communication**

**Rationale and Purpose of the Module:** To introduce students to aspects of text theory and reception theory. To show a literary work, its writer and its readers as products of their time and literature as a reaction to social and political developments.

**Syllabus:** Lecture: What is a text? The process of reading; intertextuality; reception of literature; relationship between work and biography of the writer; literature on stage: theatre; literature and politics. Tutorials: a) continuation of the introductory course to German literature; b) a study of the biography of two writers, their work and their time with a particular focus on dramatic texts.

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**GE4626 - GERMAN LITERATURE AND CULTURE 4**

**ECTS Credits:** 6

**School of Languages, Literature, Culture and Communication**

**Rationale and Purpose of the Module:** To examine major literary and cultural movements of the 19th century through a study of representative authors and various genres. To give students an understanding of the intellectual, artistic and philosophical milieu in 19th century German culture.

**Syllabus:** A study of classicism in drama and poetry and its relationship to preceding movements: 'Enlightenment' and 'Sturm und Drang'; poetic realism (1850-1890) in its social context - industrialisation, urbanisation, growth of the middle classes; and impressionism as an expression of the mood of pessimism at the turn of the century and its role in the Wilhelminische Zeit prior to World War I.

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**GE4922 - GERMAN FOR BUSINESS 2A**

**ECTS Credits:** 6

**School of Languages, Literature, Culture and Communication**

**Rationale and Purpose of the Module:** To continue the business German foundation provided in Semester 1. To continue to provide an insight into socio-economic and political structures in Germany and to develop students' familiarity with German culture. To equip students with the linguistic skills necessary to deal with business situations. To familiarise students with organisational structures of German firms.

**Syllabus:** Lecture: Postwar German-speaking countries: society and institutions; political, economic, cultural and literary trends; contemporary literature and culture in the German-speaking countries of Europe. Tutorials: a) analysis of literary texts to provide further access to the topics discussed in the lecture while at the same time further developing reading techniques, principles of textual analysis and text discussion in oral and written form; b) introduction to firm structures in Germany; induction in telephone techniques and other work-related interactive skills

Language laboratory: exercises in pronunciation, listening comprehension and grammar utilizing CALL facilities

**Prerequisites:** GE4921

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**GE4928 - GERMAN FOR BUSINESS 8A**

**ECTS Credits:** 6

**School of Languages, Literature, Culture and Communication**

**Rationale and Purpose of the Module:** To develop the skill of precise writing in German. To provide an insight into the workings of the European Union (EU) and to examine the role of Ireland and Germany and current challenges and chances. To cover current topics and debates in the German-speaking countries. To prepare students to sit, on an optional basis, international examinations in Business German such as "Pr³fung Wirtschaftsdeutsch international".

**Syllabus:** Lecture: cultural, economic and political issues in unified Germany, Austria and Switzerland; dealing with the past; nationalism and national identity; economic, cultural and social debates (also with regard to the EU); equality, environmentalism, cultural politics, social reforms and migration. Tutorials: a) discussions of literary texts, newspaper, magazine articles and TV programmes on topical issues connected with the lecture, focusing on the characteristics of different text types and language registers; b) examination of the institutions and policies of the EU with particular reference to Germany’s and Ireland's role within the EU; c) examination of the lifestyles of business professionals in Germany and Ireland.

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GY4016 - ECONOMIC GEOGRAPHY
ECTS Credits: 6

Sociology
Rationale and Purpose of the Module: The aim of this module is to provide an in-depth introduction to the globalisation of the world economy, and to explore the processes of local, regional, national and global economic development. The theory and practice of economic and political geography will provide a basis for understanding the interactions within and among the developed and developing countries of the world.

Syllabus: Economic patterns and the search for explanation; a hyperactive world: the changing global economy and its changing geographical dynamics; trading worlds: the geographical configuration of world trade; mapping patterns of contemporary world trade and explaining the processes; is a more open world trading system a “good” thing or a “bad” thing?; identifying the core economies: their spatial and temporal evolution, organisation and re-organisation; the globalisation of production systems: e.g. from farming to agribusiness; the making of transnational corporations; the practice of economies of scale, and mapping the change; spatial transformation of the periphery and the dynamics of interdependence; adjusting to a new global economy: patterns and processes of transnational integration; re-assertion of the local in the age of the global: regions and localities within the world economy.

GY4023 - GEOGRAPHY OF DEVELOPMENT
ECTS Credits: 6

Sociology
Rationale and Purpose of the Module: This module aims at familiarising students with the evolution of varying perspectives on development issues in Third World countries. It seeks to explore meanings, theories and strategies of development, and at promoting reflection on institutional and policy frameworks appropriate to tackling problems of development at multiple scales.

Syllabus: Introduction to the Third World: concepts, countries and contemporary geography; defining development and challenging stereotypes; introducing major trends in development thinking and its practical application over the last fifty years; theories, strategies and representations of development; understanding colonialism and the historical roots of underdevelopment; the development of underdevelopment: modes of production theory components of development; people, resources and environment: too many people?, too few resources?, vulnerable environments?; spaces of development, places of development: mapping movements and flows; urban spaces, rural spaces; problems and policies of rural and agricultural development; problems and policies of urban-industrial development; sustainability: life chances and livelihoods; health, hygiene and education; communities, institutions and responses; structural adjustments and globalisation: the effects of MNCs on development; development institutions and development aid.

HI4068 - IRELAND AND THE WIDER WORLD, 1919-73
ECTS Credits: 6

History
Rationale and Purpose of the Module: The module will introduce students to the study of international history and Irish diplomatic history. It will examine Ireland’s changing place in the world and its involvement in international and European affairs during three key periods 1919 to 1939, 1939 to 1961. 1961 to 1973. It aims to uncover the key assumptions and doctrines underpinning the conduct of Irish foreign policy; to explore the foreign formation process; to examine the key bilateral and multi-lateral external engagements of the Irish state since independence. The module will provide a framework for studying the key concepts, institutions and chronology of the period. expected to lead the discussion on that issue. a) to introduce students to the key events which shaped Ireland’s relations with the wider world in the twentieth century b) to explore the historiography specific to the theme, c) to consider how the newly independent state engaged in diplomatic relations with other states and confirmed its legitimacy, d) to examine the principal features of the Irish diaspora in the US, Australia, New Zealand and South Africa and d) to research and produce a written analysis of selected topics based on accurate use of secondary and primary source material.

GY4018 - HISTORICAL/CULTURAL GEOGRAPHY OF MODERN IRELAND
ECTS Credits: 6

Education & Professional Studies
Rationale and Purpose of the Module: This module aims to work with ideas which are universal in their application, and which suggest that the cultural landscape is the richest, most varied and most exciting record we possess. As a land grown old with humanity, the Irish landscape may be viewed as a text to be read, a much written over manuscript, which history has fashioned out of geography. It is representative of many authors and a mirror of many histories. Being the concrete expression of states of mind now and in the past, it is imbued with cultural meaning. The key objectives are to teach the students to be able to read the landscape, and to provide guidelines on how to write about it.

Syllabus: Living in a coded land; place-names as culture clues and lead-in guides for reading the landscape; place-name bestowal and the distribution of place-name elements; transforming spaces into places, landscape making and place naming; place-name evidence and the writing of landscapes: case studies include Yeats, Kavanagh, Heaney, Hewitt, Ñ Dhomhnaill and O’Connor; signatures of people and the making of landscape: artefacts, regions, cities; signs and symbols of home; landscape as clue to culture; an exploration of urban, suburban and rural worlds; seeing things and learning to describe them; museumised landscapes: distribution, nature and limitations; writing landscapes into existence; literary and unliterary landscapes.

Material in general.

Prerequisites: GE4927
Treaty Organisation; Ireland and the European Economic Community; multilateral organisations - League of Nations, the United Nations; the developing world - South America, Africa and Asia 1945-74; Overview

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**HI4081 - EARLY MODERN IRELAND**

**ECTS Credits:** 6

**History**

**Rationale and Purpose of the Module:** To provide a survey of late sixteenth, seventeenth, and early eighteenth-century Ireland.

**Syllabus:** The Anglo-Irish and Gaelic lordships, Tudor Reform and Reformation, the Tudor conquest (1579-1603); British settlement in Ireland; The crisis in the three kingdoms and the 1641 rising; The Catholic Confederates, Cromwellian reconquest and settlement; demographic and social trends in Restoration Ireland; The War of the Three Kings 1685-91; Patriotism and the Irish parliament.

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**HI4082 - EUROPE: SOCIETY AND GOVERNANCE; 1890 - 1990**

**ECTS Credits:** 6

**History**

**Rationale and Purpose of the Module:** The aim of this module is to examine significant political, social and cultural aspects of modern life in Europe. This course will, therefore, probe some of the key social and cultural transformations of the twentieth century, and discuss the key political issues and events that have defined that period.

**Syllabus:** Introduction to the course: war, revolution, restoration 1914-24; European societies at war; revolutionary situations/ regime change; restoration of order; democracy/dictatorship and war 1924-44; American money and reconstruction; decadent decade? jazz, cocaine and sex; depression and sobriety; political mobilisation and violence; authority restored; conservatism/fascism/Stalinism; the twenty-year crisis: international relations; the Nazi new order and total war; Holocaust; reconstruction/Cold War 1944-74; 1945: EuropeÆs æzero hourÆ: re-establishing order: EuropeÆs political divisions; recovery, growth, and limits: the European economy; seducing Europeans: mobility, consumerism, and culture; the æsecond sexÆ; feminism and post-feminism; turning tides: youth, political protest and cultural revolt; the post-post war society and state (1970s-90); rebuilding the European house: Thatcher and Gorbachev; Which Europe? race, ethnicity, and memory; after the Wall: the return of æEuropeÆ

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**HI4102 - IRELAND: REVOLUTION AND INDEPENDENCE, 1898 - 1968**

**ECTS Credits:** 6

**History**

**Rationale and Purpose of the Module:** This course charts the history of how Ireland emerged from the British Empire in the years following 1898.

**Syllabus:** The course is divided into lecture themes which address a wide range of important topics. These include the impact of the Boer War on Ireland, resurgance of the Irish Republican Brotherhood, rise of Sinn Fein, Larkin and the Union Movement, Connolly and Irish Socialism, 1916 Rising, War of Independence, Civil War and Partition, Ireland during and after the Second World War, the declaration of the Republic, Civil Rights and the origins of the modern 'Troubles'.

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**HI4112 - SOURCES FOR HISTORY**

**ECTS Credits:** 6

**History**

**Rationale and Purpose of the Module:** The purpose of this module is to introduce history students, at the start of their primary degree programme, to the central significance of sources - whether primary or secondary - to gaining an understanding of history as a discipline and especially how an appreciation of the nature of sources enriches the work of the history student as well as that of the professional historian.

**Syllabus:** 1 Historians and their sources: a brief history 2 Primary and secondary sources 3 Identification, location, accession, critical evaluation and use of sources 4 Public and private archives: origins, ideologies and holdings 5 Using archives: access, availability, procedure and professional practice

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**HI4132 - WARFARE AND DIPLOMACY: EUROPE IN THE SEVENTEENTH CENTURY**

**ECTS Credits:** 6

**History**

**Rationale and Purpose of the Module:** This module offers students an overview of the political, social and economic history of continental Europe during the seventeenth century. It is intended as a spring-semester module to complement the autumn-semester module on sixteenth-century Europe, thus providing first-years with a more gentle introduction to the early modern period than has hitherto been on offer.

**Syllabus:** The Thirty Years War and the military revolution ë mercenaries and siege warfare; developments in congress diplomacy at Westphalia, the Pyrenees, Nijmegen and Utrecht-Rastatt; the structure of state building - Cardinal Richelieu and fiscal terrorism; rebellion, civil war and Frondes - the general crisis of the mid-seventeenth century; Dutch economic primacy and world trade; credit systems, deficit-finance, the development of state-funded debt and the stock exchange; the emergence of capital cities - Madrid, Vienna and Turin; court society and the world of the minister-favourite; the decline of Spain; France in the age of Louis XIV; the emergence of absolutist states from the 1660s; aristocratic constitutionalism in Sweden, Denmark and Poland-Lithuania; Austrian expansion into the Hungarian plain; the partition of the Spanish Monarchy in 1713-14.

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**HI4148 - THE HISTORY OF AUSTRALIA**

**ECTS Credits:** 6

**History**

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Rationale and Purpose of the Module: This course aims to provide a survey of the history of Australia between the establishment of the penal colony in New South Wales in 1788 and 1918.

Syllabus: The course comprises lectures dealing with such themes as 'Terra Nullius' and the choice of Botany Bay, the French reconnaissance, hulks and prison ships, convictism, Aborigines, the 'Irish Plots' of 1800 and Castle Hill revolt of 1804, Governors Bligh, Macquarie, Darling and Bourke, the Bigge Report, 'Black War', Anti-Transportation League, Gold, Squatters, the 'Kelly Outbreak', new colonies, Federation, ANZAC and Australia during the First World War.

HS4105 - OCCUPATIONAL HYGIENE 2
ECTS Credits: 6

Chemical & Environmental Sciences

Rationale and Purpose of the Module: To familiarise the student with a broad range of occupational hygiene issues currently pertinent to the workplace environment.

To further develop the students' awareness of the occupational hygiene approach to hazard recognition, evaluation, monitoring and control in respect of key areas of ionising and non-ionising radiation, light and lighting, thermal environment and biohazards.

To develop the students' knowledge of appropriate measuring equipment and evaluation of findings in the context of occupational exposures.

Syllabus: [Ionising Radiation] electromagnetic spectrum, wavelength, frequency, energy, isotopes, alpha, beta, gamma, x-ray radiation, half-lives, penetration power, units of radioactivity, radiation dose, biological effects, radiation monitoring techniques, radioactivity & industry, control measures in the workplace

[Non-ionising radiation] including light; ultraviolet, infrared, visible light, illuminance, definitions, accommodation, adaptation, visual acuity, colour, sensitivity, radiofrequency spectrum, microwaves, lasers, assessment and control measures in the workplace.

[Thermal Environment] heat, thermoregulation, temperature extremes, thermal comfort, predicting and controlling thermal stress, thermal surveys, cold stress

[Biological hazards] classification system, infection, control measures, sterilization, disinfection, physical methods, chemical methods.

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HS4108 - HEALTH AND SAFETY SYSTEMS 2
ECTS Credits: 6

Chemical & Environmental Sciences

Rationale and Purpose of the Module: To further develop student awareness of the multifaceted approach necessary to ensure protection of the individual worker in his/her employment setting.

To serve the purpose of bringing together the focus and contents of a number of previous modules in the areas of safety systems, hazard, risk assessment and industry.

Syllabus: [Key elements of Risk Management] losses and their measurement, learning from what has gone wrong, risk assessment, risk control, safe systems of work, active monitoring, review and audit, communication and training.

[Human factors] sensory and perceptual processes of the individual, the physical environment, individual, psychological processes of the individual, the human factors environment

[Advanced Risk management] management systems, measuring performance, advanced accident investigation and risk assessment, advanced risk control techniques, emergency planning, advanced review and auditing.

[Advanced Human factors] individual difference, human error, perception and decision making, external influences on human error, improving human reliability.

[Electricity] Legislation and guidance, the nature of electricity and units of measurement, the principles of electrical safety; electrical installations (fixed and temporary); electrical transformers; electrical equipment; electric shock. [Construction site health and safety]

[Machine safety] pressure systems and lifting equipment.

Prerequisites: HS4205, ER4627

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ID4112 - DESIGN MECHANICS
ECTS Credits: 6

Mechanical, Aeronautical and Biomedical Engineering

Rationale and Purpose of the Module: This module provides students with the necessary knowledge of mechanical stress and strain theory which when applied allows them to design mechanical components and/or structures capable of withstanding a required load. The module then studies the implementation of these designs by examining the components required to convert the designs into real world systems.


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IE4214 - INDUSTRIAL ORGANISATION
ECTS Credits: 6

Design and Manufacturing Technology

Rationale and Purpose of the Module: To introduce the subject of operations management, differentiating between operations and processes. To introduce performance optimisation within limited system resources.

Syllabus: Basic concepts: Operations versus processes and relationships to lead-time, Little/Es law, lean production and dynamic responsiveness, make-to-order versus make-to-stock, resources (4 Ms), types of manufacture, product-process matrix, production planning and control activities

Cost estimating: cost elements, materials, time and capacity, quality costs, overhead activity costs, final cost/selling price, break-even analysis and make/buy, budget variance control, target costing

Layout: types of layout, Systematic Layout Planning, work-station space allowances and templates, material load and/or adjacency measures of proximal desirability, Pareto analysis of flows, string diagrams, layout evaluation and improvement.

Project Planning: Gantt, networks, critical path, uncertain times, resource levelling, time-cost trade-offs, line-of-balance.

Dispatching clerical process, priority dispatching rules,
Inventory control direct/indirect and opportunity costs of inventory, independent demand systems: perpetual and periodic reordering, safety stocks, dependent demand, bill-of-materials, material requirements planning, lot-sizing by EOQ for 1 product, Pareto ABC inventory analysis, limitations of EQQ, push versus pull, system requirements for small-lot production
Organization structure: organisation charts, determining processes and functions, grouping and integration, alternative structures.

### IE4238 - OPERATIONS ANALYSIS AM
**ECTS Credits:** 6

#### Design and Manufacturing Technology

**Rationale and Purpose of the Module:** To give students an understanding of the use of analytical models in the management of resources.
To provide students with skills for the application of linear programming and related models to resource management.
To give students an understanding of the technique of simulation and its application to systems design.

**Syllabus:**
Introduction to operations management and its applications.
Introduction to Linear programming, transportation, assignment model and network models.
Introduction to Integer programming, problem complexity and solutions to integer programming problems.
Introduction to linear programming computer software. Introduction to discrete event simulation, the simulation process? steps involved in carrying out a simulation project. Computer simulation packages: computer implementation issues, development of simulation models using a simulation package. Statistical aspects of simulation? input analysis, random number generation, output analysis.

### IE4248 - PROJECT PLANNING AND CONTROL
**ECTS Credits:** 6

#### Design and Manufacturing Technology

**Rationale and Purpose of the Module:**
To develop students abilities to plan and manage large engineering projects, and to develop skills required to effectively communicate with other company departments directly involved in such projects, namely: Finance, Manufacturing and Corporate Management.

**Syllabus:**
What is a project: the 3 goals of a project. Project selection methods, project appraisal criteria, economic analysis, Project life-cycles

The project managers role and responsibilities, leadership, professional project management, projects within organisations, the project team, motivation, teamwork, communications on projects.

Project planning: Project Charter and scope, work breakdown structures (WBS), linear responsibility chart (LRC), multidisciplinary teams, concurrent engineering, interface management, Design Structure Matrix.

Project Budgeting: Cost estimation for projects: Estimating resource, time and cost requirements and constraints; Life-cycle costs, detailed & parametric cost estimating models, Budget determination.

Project management software, MS Project applications and examples.

Project Scheduling: PERT and CPM networks, finding the critical path and critical time, milestone management, calculating slack, project uncertainty and risk management, probabilistic activity times, simulation, the Gantt Chart, additional diagramming methods.

Project Resources: Expediting a project, crashing a project, resource loading and levelling managing scarce resources on one or several projects, multiple projects, Critical Chain project management.

Project Control: Plan-Monitor-Control Cycle, Project reporting, Earned Value, Project control systems, Scope creep and project change control.

Evaluating projects: Evaluation criteria, project auditing, project termination

### IE4712 - OPERATIONS INTEGRATION
**ECTS Credits:** 6

#### Design and Manufacturing Technology

**Rationale and Purpose of the Module:**
To demonstrate the use of computer information systems in a manufacturing environment for the purposes of manufacturing data manipulation and computation.
To give the student an understanding of computer architecture, data communications and computer networks as they are used within a manufacturing environment.
To enable students write programs to capture, manipulate, and present Manufacturing and Operations Engineering data through a high level language such as Visual Basic.

**Syllabus:**
Computers in manufacturing; History of computing; Basic components of computers and operating systems.
File management, File storage, File security, Storage media; Networking, Computer settings, Printing, e-Mail, the Internet.
Computer memory; Types of ROM; Types of RAM; Buses and Registers; Memory.
Engineering Reports, Report structures; How to start writing, Appendices; Writing style, Referencing, Plagiarism. VB Programming using the mouse and graphical methods
Information Skills; accessing the library catalogue; searching the Web; searching databases, e-Journals; referencing, managing bibliographies, referencing styles. Visual Basic Controls and commands, scroll bars and selection methods.
Programming menu controls and dialog boxes.
Syllabus: Provide the student with an understanding of the claims process and the law of insurance applying to Ireland. Additionally, effective investigation and negotiation techniques are taught to implement the complexities of law to give practical application scenarios. Personality and behaviour are analysed so that a negotiator or investigator can formulate optimum tactics in their vocation.

Prerequisites: IN4003

IN4008 - REINSURANCE / ART
ECTS Credits: 6

Accounting & Finance

Rationale and Purpose of the Module: To meet the specialist skills requirements of the reinsurance industry by equipping students with a thorough grounding in reinsurance contracts, innovations in product design and the process and structure of insurance linked securitisation (ILS).

Syllabus: The secondary risk transfer device of reinsurance is an essential functional discipline in an insurance organisation. The discipline involves the design and implementation of a reinsurance structure that meets pre-determined criteria of cost economy and effectiveness consistent with solvency assurance. Alternative risk transfer is an evolving set of methodologies that essentially incorporate capital market instruments as an alternative to orthodox corporate insurance programs. (a) Principles and functions of reinsurance/alternative risk transfer. Technical analysis of major product types - quota share: surplus; spread loss; loss stabilisation; operational features of managing the reinsurance/alternative risk transfer function - reinsurance accounting; accumulation control. (b) Statistical analysis of pure risk exposures, including computer based simulations of possible loss scenarios; selection of relevant risk transfer measures; underwriting techniques; exercises in reinsurance/alternative risk transfer programming.

Prerequisites: IN4003, IN4015

IN4014 - LIFE INSURANCE
ECTS Credits: 6

Accounting & Finance

Rationale and Purpose of the Module: The module provided the student with an understanding of the principles of life insurance and the history and importance of life insurance in both the Irish market and on a global level.

Syllabus: The module includes an analysis of term insurance, whole of life insurance and endowment insurance. The health insurance market in Ireland is studied, as is the Irish social insurance system with specific focus on the retirement and pensions market. The module covers the nature and purpose of a variety of life insurance contracts and students gain knowledge of life insurance underwriting. With regard to life insurance underwriting, particular attention is paid to underwriting of a variety of diseases that affect human anatomy, theories of mortality and morbidity risk, formulation of mortality tables, and the calculation of premium for term, whole life, endowment and annuity.

Prerequisites: IN4003

IN4418 - RISK CONTROL AND UNDERWRITING
ECTS Credits: 6

Accounting & Finance

Rationale and Purpose of the Module: 1. To develop in the student an understanding of and insight into underwriting. 2. To examine the nature of the interface between regulation and insurance. 3. To allow students to comprehend the nature of cross-border business in insurance.

Syllabus: The students will gain a general understanding of international insurance and produce an some in depth analysis of specific examples

IN4738 - INTERNATIONAL INSURANCE
ECTS Credits: 6

Accounting & Finance

Rationale and Purpose of the Module: 1. To develop in the student an understanding of and insight into international insurance. 2. To examine the nature of the interface between regulation and insurance. 3. To allow students to comprehend the nature of cross-border business in insurance.

Syllabus: The students will gain a general understanding of international insurance and produce an some in depth analysis of specific examples

JA4212 - JAPANESE LANGUAGE, CULTURE AND SOCIETY 2
ECTS Credits: 6

School of Languages, Literature, Culture and Communication

Rationale and Purpose of the Module: To consolidate and increase abilities already gained in understanding, speaking, reading and writing, and further studentsÆ understanding of Japanese society, as well as to develop further strategies for autonomous language learning.

Syllabus: Listening exercises dealing with street directions descriptions of places, abilities and family. Speaking practice emphasising talk about oneÆs own and othersÆ families in the correct register descriptions of places. Reading descriptions of towns in Ireland and Japan as well as passages about Japanese sport and pastimes. Writing more complicated passages about family and place, pastimes, likes and dislikes. This will involve the introduction and practice of a further 80 kanji, bringing the total learned to 160. Discussion of aspects of Japanese society e.g. the economic system, education, Japanese literature.

Prerequisites: JA4211

JA4246 - JAPANESE LANGUAGE, CULTURE AND SOCIETY 4
ECTS Credits: 6

School of Languages, Literature, Culture and
Communication

Rationale and Purpose of the Module: To enable students to understand more advanced authentic and near authentic, modern Japanese texts and to produce a greater range of spoken and written texts; to foster in students an understanding and appreciation of modern Japanese writing; to consolidate their knowledge of issues in contemporary Japanese society.

Syllabus: Listening practice concentrating on authentic Japanese; speaking exercises using various levels of formal and informal Japanese; using language with the correct nuances of regret etc. Speaking to a group on various topics. Reading authentic and near-authentic material on Japanese life and culture as well as news stories. Writing memos, faxes, e-mails, descriptions and summaries. Use of a further 120 kanji to bring the total up to 500 characters. Translating short passages of various levels from Japanese to English.

Prerequisites: JA4213

JA4248 - JAPANESE LANGUAGE, CULTURE AND SOCIETY 6
ECTS Credits: 6

School of Languages, Literature, Culture and Communication

Rationale and Purpose of the Module: To consolidate students' previous acquisition of Japanese and to bring them to an upper intermediate level of language use in listening comprehension, speaking, reading and writing; to continue the study of Japanese culture and society.

Syllabus: Listening practice using authentic materials. Further practice in the use of polite language. Vocabulary consolidation; presentations, practice for interviews. Reading practice of authentic news stories, and authentic passages relating to Japanese society and modern literature. Translation of authentic passages, literary or business-related. Writing of summaries, descriptions, letters, and passages expressing opinions. Study of a further 200 kanji, to bring the total up to 750 characters.

Prerequisites: JA4247

JA4912 - JAPANESE FOR BUSINESS 2
ECTS Credits: 6

School of Languages, Literature, Culture and Communication

Rationale and Purpose of the Module: To consolidate and increase abilities already gained in understanding, speaking, reading and writing, and further students' understanding of Japanese society, as well as to develop further strategies for autonomous language learning.

Syllabus: Listening exercises dealing with street directions descriptions of places, abilities and family. Speaking practice emphasising talk about one's own and others families in the correct register descriptions of places. Reading descriptions of towns in Ireland and Japan as well as passages about Japanese sport and pastimes. Writing more complicated passages about family and place, pastimes, likes and dislikes. This will involve the introduction and practice of a further 80 kanji, bringing the total learned to 160. Discussion of aspects of Japanese society e.g. the economic system, education, Japanese literature.

Prerequisites: JA4911

JA4914 - JAPANESE FOR BUSINESS 4
ECTS Credits: 6

School of Languages, Literature, Culture and Communication

Rationale and Purpose of the Module: To enable students to understand more advanced authentic and near authentic, modern Japanese texts and to produce a greater range of spoken and written texts; to foster in students an understanding and appreciation of modern Japanese writing; to consolidate their knowledge of issues in contemporary Japanese business and society.

Syllabus: Listening practice concentrating on authentic Japanese; speaking exercises using various levels of formal and informal Japanese; using language with the correct nuances of regret etc. Speaking to a group on various topics. Reading authentic and near-authentic material on Japanese business life and culture as well as news stories. Writing memos, faxes, e-mails, descriptions and summaries. Use of a further 120 kanji to bring the total up to 500 characters. Translating short passages of various levels from Japanese to English.

Prerequisites: JA4913

JA4918 - JAPANESE FOR BUSINESS 8
ECTS Credits: 6

School of Languages, Literature, Culture and Communication

Rationale and Purpose of the Module: To consolidate students' previous acquisition of Japanese and to bring them to an upper intermediate level of language use in listening comprehension, speaking, reading and writing; to continue the study of Japanese culture and society.

Syllabus: Listening practice using authentic materials. Further practice in the use of polite language. Vocabulary consolidation; presentations, practice for interviews. Reading practice of authentic news stories, and authentic passages relating to Japanese society and modern literature. Translation of authentic passages, literary or business-related. Writing of summaries, descriptions, letters, and passages expressing opinions. Study of a further 200 kanji, to bring the total up to 750 characters.

Prerequisites: JA4917

JM4002 - PROFESSIONAL SKILLS FOR JOURNALISM 2
ECTS Credits: 3

School of Languages, Literature, Culture and Communication

Rationale and Purpose of the Module: Professional Skills for Journalism 2 aims to develop students' abilities in finding and developing news stories and small features, to editing and headline writing for print, internet and broadcast, and designing and creating for print and internet.

Syllabus: Students will generate their own stories, through observation and research, and develop them in regular news and features conferences. They will develop their desktop publishing techniques, analysing the
elements of type; writing headlines and standfirsts; editing and handling pictures and developing their skills in layout and proof reading. They will design pages in a wide variety of styles for magazines and newspapers, using material generated in Journalistic Writing 2, and using their own photographs and other illustrations. Speakers from newspapers and magazines will give students an insight into professional design, photography and picture editing. Assessment will be through a portfolio of designs, their own website, some broadcast material and a timed editing and page creation examination.

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JM4004 - MAGAZINE JOURNALISM
ECTS Credits: 6

School of Languages, Literature, Culture and Communication

Rationale and Purpose of the Module: To give students a thorough understanding of the magazine market, from lifestyle magazines to Business to Business publications, including contract and customer publishing. To enable students to think creatively and develop their ideas to help them understand how magazines work and to create a pitch for a new magazine.

Syllabus: Students will learn how the magazine market works, the differences between the various different kinds of magazine, readership markets and revenue streams. Professionals will speak about their part of the industry to give the students a broad understanding. Students will select a magazine and research it, from circulation to readership, advertising and other revenues. They will obtain interviews to clarify any points, and produce a profile of the magazine, which will form the basis of a presentation to the class. In the second half of the semester students will work on a Project Oscar: in groups of about five, they will generate an idea for a new magazine, research the market, produce reader profiles, produce details of features, design dummy pages and pitch their projected magazine to the class, tutors and a magazine professional. Assessment will be by coursework: production of a portfolio of work completed during the course, and contributions to class discussions.

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JM4012 - JOURNALISTIC WRITING 2
ECTS Credits: 6

School of Languages, Literature, Culture and Communication

Rationale and Purpose of the Module: Journalistic Writing 2 follows on from the module in Semester 1. The course aims to develop students%E writing skills in producing short features and reviews for a variety of publications.

Syllabus: Students will extend their knowledge of different journalistic forms, including short features, profiles of each other and visiting speakers, vox pops, and reviews of music, clubs or bars. They will be encouraged to reflect on and analyze each other%Es and professional work through a course web forum. Regular news writing workshops will continue, including one on a breaking news exercise and a wrap story exercise. They will be helped to begin writing for student publications, and will be encouraged to write their own blogs. Assessment will be by the production of a portfolio of work completed during the course, and a final timed examination.

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JM4014 - FEATURE WRITING
ECTS Credits: 6

School of Languages, Literature, Culture and Communication

Rationale and Purpose of the Module: Feature Writing aims to develop students%E writing skills in producing features of different types for a variety of publications.

Syllabus: Students will learn how to generate ideas for features, pitch feature ideas at mock feature conferences, research using printed and web sources and face to face and telephone interviews, develop their ideas for specific target publications, and write lively material. They will work on feature structure and writing standfirsts. They will produce publishable features of different kinds, including an interview/profile, colour writing or reportage and an analytical researched feature. They will be encouraged and helped to get work published either in a student or professional publication, or on their own websites. Assessment will be by coursework: production of a portfolio of work completed during the course, and contributions to class discussions.

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JM4018 - INDIVIDUAL JOURNALISM PROJECT
ECTS Credits: 6

School of Languages, Literature, Culture and Communication

Rationale and Purpose of the Module: The individual project aims to help students in-depth reporting, broadcasting, writing and design skills through work on a substantial project of their own choice. It aims to help them produce 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 10-minute television documentary OR multimedia project on this or a related topic, or a series of shorter packages. A target publication and broadcast outlet must be identified and justified. 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. Students will demonstrate cognisance of news processes, evidence of research, ethical considerations and sound editorial judgement in the production of the project and portfolio.

**JM4022 - INTRODUCTION TO SOCIAL MEDIA**  
ECTS Credits: 6

**School of Languages, Literature, Culture and Communication**

**Rationale and Purpose of the Module:** This module aims to equip students with the web-based research, organisational and value judgement skills necessary to examine and understand critically the power of social media in a globalised world. It aims to enable students to become better critical thinkers and researchers by giving them the skills to understand social media, to question its relevance, its accuracy and its legitimacy; and to construct news in a social media format. It will equip students with communication skills that are appropriate to a first-year level and which will enable them to participate effectively in their university degree.

**Syllabus:** This module is a foundation for new university students that will introduce them to thinking critically about social media. Taught elements will include concepts drawn from theoretical communications, social and media studies, as well as practical approaches including hierarchical news writing and information construction. The module will examine the changing nature of how news is disseminated through social media and investigate citizen engagement with news. It will give a practical introduction to the use of social media for the purposes of information gathering, as a source for news and as a potential agent of democratisation of media and society. Practical cases will be understood through recent theoretical perspectives on human collaboration and communication. The changing dynamic of news from the traditional (linear) model to the new media (circular) model will be explored. The course has a strong focus on both the use of social media for practical exercises and on evidence-based critical thinking.

**JM4442 - SHORTHAND 2**  
ECTS Credits: 3

**School of Languages, Literature, Culture and Communication**

**Rationale and Purpose of the Module:** To explore different contexts within which professional journalists regularly use shorthand  
To develop further the listening skills required for taking shorthand  
To develop greater competence in recording notes neatly and accurately, using a recognised form of shorthand  
To develop greater competence in reading and transcribing notes fluently and accurately  
To refine language skills especially vocabulary, spelling and punctuation.

**Syllabus:** Building on Shorthand 1, this module will explore the different contexts within which professional journalists regularly use shorthand (such as courts, council meetings, DBII) and the value of shorthand notes as legally acceptable evidence. Through further regular practice, students will develop their listening skills further and deepen their knowledge of a recognised form of shorthand, whilst also learning to read and transcribe their notes fluently and accurately. Students will be encouraged to identify any final challenges they have in relation to language skills and rectify these through independent work. Students will also be expected to look for opportunities outside the contact hours to practise their shorthand skills on a regular basis. Students must be able to achieve a level of 90 words per minute by the end of this module.

**LA4002 - JURISPRUDENCE**  
ECTS Credits: 6

**Law**

**Rationale and Purpose of the Module:** To acquire a variety of theoretical perspectives on law through an examination of its nature and operation and an analysis of key concepts and issues.


**LA4008 - COMPANY AND PARTNERSHIP LAW**  
ECTS Credits: 6

**Law**

**Rationale and Purpose of the Module:** To provide students with an understanding of the legal regulation of the primary forms of business organisation: the corporate entity and the partnership unit.

This module will be offered on the programme Higher Diploma in Accounting (title to be changed to Professional Diploma in Accounting)

**Syllabus:** Corporate formation: types of companies,
formalities, advantages and disadvantages of incorporation, corporate personality, piercing the veil, groups of companies; corporate governance; role of shareholders, directors, employees, directors' duties, AGM, accounts and audits; minority shareholder protection; protection of parties dealing with corporations: creditors, voluntary and involuntary, charges over companies; ultra vires contracts; capital integrity; minimum requirements, distributions out of profits, repayments of capital; corporate termination: liquidation, receivership, winding up, examinership, amalgamations and reconstructions. Partnerships; joint and several liability; formation of partnerships; dissolution of partnerships; limited partnerships.

LA4012 - COMPARATIVE LEGAL SYSTEMS
ECTS Credits: 6

Law
Rationale and Purpose of the Module: To show the historical development of common law. Early Irish law. Roman law. Civil law. Some fundamental concepts. German, French, Spanish and Scottish legal systems - introduction. How a Civil lawyer finds the law. American legal system. Other conceptions of law and the social order.

LA4022 - COMMERCIAL LAW
ECTS Credits: 6

Law
Rationale and Purpose of the Module: To familiarise the student with the legal background of commercial transactions.


LA4032 - CRIMINAL PROCEDURE
ECTS Credits: 6

Law
Rationale and Purpose of the Module: This course will consider the procedures to be used in the criminal justice system from the earliest moment of investigation, right through to sentencing. The system as a whole will be evaluated from various value-based positions, encouraging critical reflection among students. Key areas such as policing, trial procedure, and the sentencing process will be considered in depth. The course will involve a mixture of legal detail and sociological theory to give a rounded appreciation of the issues addressed. By the end of the course students should have a strong, and critical, understanding of the how the criminal justice system operates.


LA4035 - LABOUR LAW
ECTS Credits: 6

Law
Rationale and Purpose of the Module: To familiarise the student with the legal regulation of contracts of and for employment, industrial relations and remedies thereeto.

LA4038 - FAMILY LAW
ECTS Credits: 6

Law
Rationale and Purpose of the Module: The aim of the course is to familiarise students with the core concepts of Irish family law.

Syllabus: The module will examine the following: nullity; domestic violence; child custody and access disputes; maintenance, separation agreements; judicial separation; divorce; preliminary and ancillary relief in judicial separation and divorce proceedings; and the non-marital family.

LA4042 - ADMINISTRATIVE LAW
ECTS Credits: 6

Law
Rationale and Purpose of the Module: To provide students with the mechanisms to test whether any decisions or actions taken by government or governmental agencies are lawful, and examine the redress available for aggrieved citizens.

Syllabus: Historical political and administrative background to administrative law within Ireland; relationship of administrative law with the Constitution of Ireland/ Delegated legislation, decisions, administrative acts, informal rules, circulars. The use of discretion. The principles and procedures of judicial review. Remedies.

LA4044 - LAW OF THE EUROPEAN UNION 2
ECTS Credits: 6

Law
Rationale and Purpose of the Module: This module will review and identify major developments in the substantive law of the European Union, its interpretation and development, with special reference to the foundations and common rules and policies of the Common Market and the realisation of an internal market. The policies dealt with will include i.e. the free movement of goods, persons, services, capital and payments, competition, social policy and animal welfare.

Syllabus: The module covers, in the first instance, background to the single market/common market. The module proceeds to examine in detail the Four Freedoms: free movement of goods, the free movement of persons (including workers, families/dependents, students, retired citizens), the freedom of establishment and the provision of services. Competition Law, including restrictive agreements and abuse of a dominant position will be examined. Social policy, (Equal pay and treatment, same sex couples, transsexuals etc.) will be covered and the module will end with a discussion on the impact of European Law on the animal welfare with specific reference to Treaty developments form the 1960s and the initial connection between animals and agriculture to recognition of the sentience of animals in the Treaty of Amsterdam and Lisbon, recent development including the Cat and Dog Fur Regulation and the Cosmetics Directive.

**LA4052 - INTRODUCTION TO LAWYERING 2**
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 begun to deal with core issues in the practice of law including logical reasoning, questioning, option generation, problem solving, oral argument and advocacy, together with client interviewing. The syllabus will focus extensively on self-directed learning and active exercises. In addition, students will be expected to explore the role of ethics and professional responsibility in the legal system, paying particular attention to comparative approaches.

**LA4062 - CONSTITUTIONAL LAW 2**
ECTS Credits: 6

**Law**

Rationale and Purpose of the Module: On successful completion of this module, a student will be able to:

- Demonstrate an understanding of the doctrine of fundamental rights from an international and Irish perspective
- Identify the various fundamental rights protected by the Constitution
- Examine the limitations placed on the exercise of rights
- Appraise the relationship between the various stakeholders in fundamental rights discourse and assess how these interests should be balanced.
- Reason by analogy and apply the law on fundamental rights to determine the likely outcome of a court action.
- Critically evaluate the extent to which the experiences and responses of other jurisdictions, as well as international human rights principles should influence Irish law.

**LA4082 - LAW OF EVIDENCE**
ECTS Credits: 6

**Law**

Rationale and Purpose of the Module: To examine the law relating to the governance and regulation of sport.

Syllabus: Sport and the Law will examine the interaction between the law and sport. The course will examine a number of topics, including what is sport and the law, violence in sport, drug testing, contract and employment issues, administration and judicial review, commercial and competition law, arbitration and alternative dispute resolution.

**LA4098 - SPORT AND THE LAW**
ECTS Credits: 6

**Law**

Rationale and Purpose of the Module: To examine the grounds upon which contracts may be discharged or avoided and the remedies available to ensure performance of contractual obligations.


LA4126 - CIVIL LIBERTIES
ECTS Credits: 6
Law
Rationale and Purpose of the Module: This module deals with the law pertaining to civil liberties and human rights in England and Wales. It covers the constitutional material required in order to gain the exemption for Constitutional Law for access to professional legal education in England and Wales. Accordingly, the focus tends to be on English legislation dealing with police powers, criminal procedure, contempt of court, official secrets, censorship, discrimination, extradition, deportation and asylum.

Syllabus: The following topics are discussed in the module: the concepts of civil liberties and human rights; the right to liberty and freedom of movement; Police powers (stop; search and arrest; detention and interrogation; right to silence; body searches and intimate samples); property rights (Police powers of entry; search & seizure; property production orders; surveillance; forfeiture and confiscation); freedom of expression (Official secrets; breach of confidence; freedom of information; Contempt of court; obscenity and indecency); the right to privacy; freedom of assembly and freedom of association (Police powers and public order); right of residence (extradition; deportation; asylum); freedom from discrimination (gender; race; and disability; the right to a fair trial (adversarial procedure; due process; legal representation; the jury; burden and standard of proof; rules of evidence) and an overview of the European Convention on Human Rights.

LA4222 - CRIMINAL LAW 2
ECTS Credits: 6
Law
Rationale and Purpose of the Module: By building on Criminal Law 1, to examine the principal criminal offences and elements of criminal procedure.


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.


LA4320 - LAW OF TORTS 2
ECTS Credits: 6
Law
Rationale and Purpose of the Module: To examine the tortious concepts of trespass, nuisance, defamation and economic torts. To evaluate remedies in the area of Tort Law and the assessment of damages.


LA4440 - CONSTITUTIONAL LAW 2
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 Constitutional Law bears the more commonly used term for the study of this area of law.

Syllabus: The aim of this course is to examine the fundamental rights provisions of the Irish Constitution, considering always the obligations of the state under international law. Topics to be covered include fundamental rights theories, unenumerated rights and enumerated rights and directive principles of social policy under the Irish Constitution.

LA4540 - COMPANY LAW 2
ECTS Credits: 6
Law
Rationale and Purpose of the Module: Currently, the School of Law delivers two modules called Law of Business Associations 1 and 2. The name Law of Business Associations is outdated and cumbersome. The two new modules being created will keep the content of the Business Associations modules but will use the more commonly used name of Company 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 module covers the administration of companies insofar as topics covered include; the appointment, role and duties of Directors, the role and...
duties of the Company Secretary and the Annual return obligations of companies. The module also covers issues of dividends and the company law limitations on profit distributions. In addition, the module covers the various methods of enforcement of company law. The consequences of a company's secured borrowings are also considered in terms of the secured party enforcing security by appointment of a receiver. The statutory scheme and facility of examinership for a company in financial difficulty is reviewed and the duties of court appointed examiners analysed. Finally, the module covers the various methods of winding up of companies and the roles of different types of liquidators. The duties of liquidators are examined and the connections between those duties and the schemes and bodies of company law enforcement are reviewed.

LA4610 - LAND 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.


LA4620 - LAND LAW 2
ECTS Credits: 6

Law
Rationale and Purpose of the Module: To familiarise the student with a detailed knowledge of the regulatory aspects of the use of real property, including landlord and tenant law and the law of succession.

Syllabus: The laws relating to succession, statutory control of the right to devolve property upon death, wills and intestacies. Landlord and Tenant Law, nature and creation of the relationship, determination of the relationship, statutory control of tenancies, public welfare codes. Lesser interests in real property including licences and covenants. The distinction between leases and licences. Mortgages.

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,

LA4828 - EQUITY AND TRUSTS 2
ECTS Credits: 6

Law
Rationale and Purpose of the Module: To inculcate in the student an understanding of the modern law of trusts, their creation and regulation.

Syllabus: The trust, classification of trusts, express, implied, resulting, constructive and charitable trusts. The requirements of a trust, the constitution of trusts. General principles relating to trustees, their obligations and duties, powers of trustees, variations in a trust, fiduciary responsibilities of trustees. Breach of trust and remedies thereof.

LA4918 - COMPANY LAW
ECTS Credits: 6

Law
Rationale and Purpose of the Module: This module will entail a study of the law in relation to the incorporation and constitution of business associations in Ireland.

Syllabus: Introduction to business associations, companies, sole traders and partnerships, the historical development of company law, effects of incorporation, separate legal personality, torts and contracts, lifting the veil, limitation of liability, distribution of assets on winding up, majority rule, minority protection. Formation of a company, memorandum and articles of association, flotation, application for allotment of shares, commencement of business.

LA4922 - SPORT AND THE LAW
ECTS Credits: 6

Law
Rationale and Purpose of the Module: To examine the law relating to the governance and regulation of sport.

Syllabus: Sport and the Law will examine the interaction between the law and sport. The course will examine a number of topics, including what is sport and the law, violence in sport, drug testing, contract and employment issues, administration and judicial review, commercial and competition law, arbitration and alternative dispute resolution.

LA4928 - COMPANY AND PARTNERSHIP LAW
ECTS Credits: 6

Law
Rationale and Purpose of the Module: To analyse from a business perspective the law governing the principal forms of business association, namely companies and partnerships.

Syllabus: Corporate formation: types of companies, formalities, advantages and disadvantages of incorporation, corporate personality, piercing the veil, groups of companies; corporate governance; role of shareholders, directors, employees, directors¿ duties, AGM, accounts and audits; minority shareholder protection; protection of parties dealing with corporations: creditors, voluntary and involuntary, charges over companies; ultra vires contracts; capital integrity; minimum requirements, distributions out of profits, repayments of capital; corporate termination: liquidation, receivership, winding up, examinership, amalgamations and reconstructions. Partnerships; joint and several liability; formation of partnerships; dissolution of partnerships; limited partnerships.
**LA4938 - ADMINISTRATIVE LAW**
**ECTS Credits: 6**

**Law**

**LI4212 - LINGUISTICS 2**
**ECTS Credits: 6**

**School of Languages, Literature, Culture and Communication**

**Rationale and Purpose of the Module:** This course is designed to serve as an introduction to basic concepts and theories in sociolinguistics. The various subfields and branches of sociolinguistics will be introduced and discussed in class lectures.

The more specific objectives of this course are: Recognize the fundamental relationship between language and society. Use the basic terminology and concepts of sociolinguistic subfields. To acquaint you with the basic concepts necessary to pursue sociolinguistics studies further, if you wish.

**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. **Sociolinguistics:** In this first part, students will be introduced to basic concepts in sociolinguistics, including: accent, dialect, speech community.
2. **Multilingualism:** In this second part, students will learn about key features of multilingual societies.
3. **Language and Media:** In the third section, students will focus on the relationship between language and how it is used in the media.
4. **Language and Gender:** The final section of the module will focus on the relationship between language and gender.

**Prerequisites:** LI4211

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**MA4002 - ENGINEERING MATHEMATICS 2**
**ECTS Credits: 6**

**Mathematics & Statistics**

**Rationale and Purpose of the Module:** To provide the student's understanding of and problem solving skills in the areas of Integral Calculus and Differential Equations. To give the student an understanding of the Matrix Algebra and its application to solving systems of linear equations. To introduce the student to Multivariate Calculus.

**Syllabus:** [The Indefinite Integral]: Integration techniques including integration of standard functions, substitution, by parts and using partial fractions. [The Definite Integral]: Riemann sums, and the Fundamental theorem of calculus. Application of integration to finding [areas, lengths, surface areas, volumes and moments of inertia]. [Numerical Integration]: Trapezoidal rule, Simpson's rule, other Newton-Cotes formulae and Gaussian quadrature.

**Prerequisites:** MA4001

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**MA4006 - ENGINEERING MATHEMATICS 5**
**ECTS Credits: 6**

**Mathematics & Statistics**

**Rationale and Purpose of the Module:** To provide students with an understanding of the fundamentals of probability and its relation to statistics. To introduce statistical inference through the concepts of estimation and hypothesis testing. To apply these concepts to problems from both daily life and engineering/science.


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**MA4004 - ENGINEERING MATHEMATICS 4**
**ECTS Credits: 6**

**Mathematics & Statistics**

**Rationale and Purpose of the Module:** To provide a core of mathematics which is significant 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: common number systems in use; 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.

**Prerequisites:** MA4001
Mathematics & Statistics

Rationale and Purpose of the Module: To introduce the student to elementary Vector Calculus. To give the student a broad understanding of analytical and numerical techniques for solving Partial Differential Equations.

Syllabus: Vector Calculus: Scalar and vector fields, contour maps, directional derivative and gradient vector of a scalar field, divergence and curl of a vector field (line, surface and volume integrals), Integral Theorems (Gauss', Green's and Stokes').

Prerequisites: MA4003

MA4014 - SCIENCE AND ENGINEERING
MATHEMATICS
ECTS Credits: 6

Mathematics & Statistics

Rationale and Purpose of the Module: To develop the students' understanding and problem solving skills in the areas of integral calculus and differential equations with application to engineering problems; to give the student an understanding of matrix algebra and its application to solving systems of linear equations; to introduce the student to the Laplace Transform and its use in solving ordinary differential equations.

Syllabus: Review definite integral as an accumulation; Definite integral applications: population growth, acceleration problem solving; Differential equations: first order (separable and linear), linear homogeneous second order, applied problems; Matrices and linear systems: basic concepts: addition, multiplication, determinants, inverse of a matrix (2x2, 3x3); linear transformation; eigenvalues and eigenvectors; matrix diagonalisation; power of a diagonal matrix. Laplace transforms: improper integrals, transforms of common functions, inverse transforms; transform of a derivative; application of Laplace transforms to finding solutions of ordinary differential equations; transfer functions.

MA4102 - BUSINESS MATHEMATICS 1
ECTS Credits: 6

Mathematics & Statistics

Rationale and Purpose of the Module: To introduce mathematical/statistical concepts and techniques which are needed in subsequent mathematics, statistics and business modules.
To develop an appropriate foundation in mathematics for students from diverse mathematics background.


Descriptive statistics: mean, standard deviation, median, inter-quartile range, histogram, ogive, percentiles. Introduction to probability: events, conditional probability, independence, Bayes' formula. Random variables: the notion of a probability distribution, binomial distribution, Poisson distribution, the notion of a density function, the exponential density, the normal density, expectation and variance, the Central Limit Theorem, the normal approximation to the binomial. Fitting distributions to data: method of moments, maximum likelihood, assessment of goodness of fit.

MA4104 - BUSINESS STATISTICS

ECTS Credits: 6

Mathematics & Statistics

Rationale and Purpose of the Module: To provide the statistical framework which will enable students in economics, accounting, finance, personnel management and marketing to perform statistical analysis within their subject disciplines.

To equip students with the skills to interpret and summarise results generated by statistical packages.

Syllabus: The concept of a random sample, the sampling distribution of the sample mean with applications to confidence intervals, hypothesis testing, and sample size determination, the sampling distribution of the sample proportion with applications to confidence intervals, hypothesis testing, and sample size determination, comparing two means, comparing two proportions, the chi-squared test of independence, Simpson's Paradox, simple linear regression, correlation, residuals.

MA4128 - ADVANCED DATA MODELLING
ECTS Credits: 6

Mathematics & Statistics

Rationale and Purpose of the Module: To ground the students in Applied Multivariate Analysis. The module serves business and mathematics students. It introduces the mathematical statistical ideas behind Principal Component Analysis, Factor Analysis, Cluster Analysis, Discrimination Function and the Multiple Linear Logistic function. The students learn how to implement these techniques in Minitab to become competent in the analysis of a wide variety of multivariate data structures.

Syllabus: Principal Component Analysis, Cluster Analysis, Discrimination Function and the Multiple Linear Logistic function and Factor Analysis are introduced in this order. From the outset the Minitab (Statistical Package) is introduced. Different types of multivariate data structures are introduced. The analyses appropriate to each type of data structure are deduced from general principles and their implementation in Minitab described. Many different data structures are considered. Emphasis is placed on the integration of the different methods of analysis available in order to achieve an effective interpretation and simple summary of the multivariate
data. Report writing, communicating the interpretation to non-technical business managers, is taught.

Prerequisites: EC4307, MA4125

MA4302 - APPLIED STATISTICS FOR ACCOUNTING
ECTS Credits: 6

Mathematics & Statistics

Rationale and Purpose of the Module: This course is designed to give students the statistical background required to apply statistical techniques to data both of general interest and of interest specific to business activity. This involves 1) presenting data using descriptive measures and graphical means, 2) presenting hypotheses that can be tested statistically, together with an appropriate interpretation of the test results and 3) analysing time series data and prediction. In order to deal with large data sets, the lectures are accompanied by computer laboratories using a statistical computer package (SPSS).

Syllabus: 1. Sampling methods and descriptive statistics - collection and tabulation of data. Descriptive measures and graphical presentation of data.
2. Basic concepts of probability - probabilities of the union and intersection of events, conditional probability, contingency tables.
3. Discrete probability distributions - the binomial distribution. Expected values.
4. Continuous probability distributions - the normal and Pareto distributions - relevance to natural and economic phenomena.
5. Applications of the central limit theorem - interval estimation.
6. Hypothesis testing - one and two sample tests for population proportions and means. Tests of association.
7. The Pearson and Spearman correlation coefficient and graphical presentation of data.
9. Use of a statistical package (SPSS) for data input and transformation, as well as carrying out the statistical methods described above.

ECTS Credits: 6

Mathematics & Statistics

Rationale and Purpose of the Module: To develop some of the foundations of mathematics. To introduce the students to mathematical ideas of crucial importance in computer science. Symbolic mathematics packages will be used to demonstrate many of these ideas.

Syllabus: Real-valued functions: a geometrical approach to calculus through the graphs of functions of one or two variables (use will be made of symbolic maths packages).
Convergence of sequences.
Simple numerical methods. Iteration of functions.
Matrices: addition, multiplication and scalar multiplication. Matrices as linear transformations in computer graphics.
Graph theory: basic concepts of vertices, edges, paths, circuits, connectedness and trees. Computer representation of graphs. Graph algorithms.

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MA4402 - COMPUTER MATHS 2

ECTS Credits: 6

Mathematics & Statistics

Rationale and Purpose of the Module: To develop the fundamental concepts and basic tools of calculus. To introduce applications of calculus in science and technology. To develop and integrate the basic scientific mathematical skills.

Syllabus: [Integration and applications:] indefinite integral as antiderivative; integration by substitution; definite integral as area; Fundamental Theorem of Calculus; integration by parts; calculation of areas; applications in science. Introductory treatment of Simpson's Rule.
[Functions of the Calculus:] domain and range; inverse trigonometric functions, hyperbolic functions, their graphs and derivatives.
[Integration and applications:] definite integral as antiderivative; integration by substitution; definite integral as area; Fundamental Theorem of Calculus; integration by parts; calculation of areas; applications in science. Introductory treatment of Simpson's Rule.
[Series and sequences:] sequences and series; convergence; power series; Maclaurin and Taylor series; addition, multiplication, differentiation and integration of power series; use as approximation of a function; limits, l'Hopital's rule.

Prerequisites: MA4601

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MA4604 - SCIENCE MATHEMATICS 4
ECTS Credits: 6

Mathematics & Statistics

Rationale and Purpose of the Module: The student should be able to: Compute using real and complex numbers; solve basic ordinary differential equations; find critical points of functions of one variable; represent a function using Fourier series.

Syllabus: [Modelling with differential equations:] Derivation of differential equations of exponential growth and decay. Application to population growth, radioactive decay and other problems from science and engineering. [Ordinary differential equations:] First order equations of variables separable, homogeneous and linear types; Second order homogeneous equations with constant coefficients. Numerical solutions of ordinary differential equations by Euler's method and Runge-Kutta methods. [Fourier Series:] Review of periodic functions; Fourier Series of functions of period and arbitrary periods; Fourier series of even and odd functions; applications to solving second order linear constant coefficient ordinary differential equations with periodic input. [Laplace and Fourier Transforms:] definition of Laplace transform; transforms of elementary functions; tables of transforms; inverse Laplace Transform; convolution; solution of linear constant coefficient ordinary differential equations with applications to physics and chemistry (e.g. LCR circuits, damped mass spring, reaction rates); Heaviside step function and transforms of piecewise continuous functions; Fourier transform and its relation...
to the Laplace transform.

Prerequisites: MA4602, MA4601

MA4607 - INTRODUCTION TO APPLIED MATHEMATICAL MODELLING IN CONTINUUM MECHANICS
ECTS Credits: 6

Mathematics & Statistics

Rationale and Purpose of the Module: To provide an introduction to the basic concepts of continuum mechanics with emphasis on 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: MA44007

MA4702 - TECHNOLOGICAL MATHEMATICS 2
ECTS Credits: 6

Mathematics & Statistics

Rationale and Purpose of the Module: To develop the fundamental concepts and basic tools of calculus. To introduce applications of calculus in science and technology. To develop and integrate the basic mathematical skills relevant to technology.

Syllabus: Functions of the Calculus: graphs and functions, domain and range, inverse trigonometric functions, hyperbolic functions. Curve sketching: symmetries, intercepts, restrictions on range, discontinuities, turning points, behaviour for large and small x, asymptotes; Series: sequences, series as sum of sequence, sums of arithmetic and geometric series, infinite series and convergence, ratio and comparison tests, power series, Maclaurin and Taylor series, manipulation of power series, differentiation and integration of power series, use as approximation of a function, limits, l'Hopital's rule; Integration and applications: indefinite integral as antiderivative, integration of standard functions, definite integral as area, integration by substitution, integration by parts, applications to: area, volumes, surfaces of revolution, numerical integration including Simpson's rule; Partial derivatives: functions of two variables, partial derivative, definition and examples, differential and total differential, higher partial derivatives, application to small errors.

Prerequisites: MA4702, MA4701

MA4704 - TECHNOLOGICAL MATHEMATICS 4
ECTS Credits: 6

Mathematics & Statistics

Rationale and Purpose of the Module: To introduce students to the fundamental ideas of uncertainty through probability. To lay a good foundation for the stream of statistically oriented modules in the fourth year. To introduce students to the most widely used statistical distributions and applications thereof. To introduce statistical inference through the concepts of estimation and hypothesis testing.

Syllabus: [Variables] - continuous and discrete. [Representation of variables] - frequency tables, histograms, bar charts, etc. [Reduction of variables] - measures of location and dispersion, mean, variance, range, median, quartiles, etc. [Introduction to the fundamentals of probability]. Experiments, sample spaces, events. Laws of probability - addition and multiplication, conditional probability. [Bayes theorem], prior and posterior distributions. [Introduction to random variables], probability density functions. [Special distributions] [binomial, Poisson, geometric, uniform, exponential, normal]. [Statistical inference], point and interval estimates, standard error of an estimator, hypothesis testing, one and two-tailed tests. One and two sample problems for the mean, variance and proportion. [Non-parametric tests] - sign test, rank tests. [Correlation and Regression] - method of least squares.

Prerequisites: MA4702, MA4701

MA4708 - QUALITY CONTROL
ECTS Credits: 6

Mathematics & Statistics

Rationale and Purpose of the Module: to develop skills in the use of the appropriate statistical techniques in quality control

Syllabus: history an development of techniques statistical process control charts: capability: Cp, Cpk, R&R studies control charts (Shewart), variable and attribute, control & out of control, specifications, short and long run applications, proportion defective, ARL, PPM cusum, multivari acceptance sampling : AQL, CQL, risks, construction of sampling plans, various international standards

Prerequisites: MA4707

MA6001 - DATA ANALYSIS FOR BUSINESS DECISIONS
ECTS Credits: 6

Mathematics & Statistics

Rationale and Purpose of the Module: To give students a full understanding of how statistics an its applications. To provide students with a full understanding of how statistical inference provides sound evidence for business decisions.

Syllabus: Data and Statistics - various types of data, qualitative and quantitative data, sources of data. Graphical presentation of data - bar charts, pie charts, histograms, ogive curves, box plots. Measures of location and spread - mean, median, mode, range, standard deviation and variance. Introduction to probability - discrete and continuous distributions e.g. Binomial, Poisson and Normal. Sampling and Sampling Distributions - populations and samples, various sampling methods. Point and Interval estimation for means, variances and proportions in one and two sample applications. Hypothesis testing - One and two tailed tests, type I and type II errors, p - values. Analysis of qualitative data - contingency tables, goodness - of - fit

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**MB4002 - ALGEBRA 2**
ECTS Credits: 6

**Mathematics & Statistics**

**Rationale and Purpose of the Module:**
To promote an understanding of basic algebraic concepts of discrete mathematics.

To examine the use of transformations in geometry.

To apply discrete mathematics in the solution of various applied problems.

**Syllabus:** Mathematical logic: statements, sentences, truth tables, quantifiers, proof; Sets: notation, definition, set operations; Relations: equivalence relation, partitions, congruence; Mappings: injective, surjective, bijective maps, composition, inverse; Mappings in the plane: projections, transformations; Matrix representation; Algebra of sets: De Morgan's law, principle of duality; simple applications to switching theory.

Prerequisites: MB4001

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**MB4008 - GROUPS AND ALGEBRAIC STRUCTURES**
ECTS Credits: 6

**Mathematics & Statistics**

**Rationale and Purpose of the Module:** To develop a broad understanding of algebraic structures especially group structure.

To study realizations of group structure in geometry.

To study selected applications in Science and Engineering.

**Syllabus:** Groups and operations: review of sets, operations; Groupoids and semi-groups; equality, commutativity, associativity, inverses, order; Groups: axioms, properties, sub-groups, cyclic groups, p-groups, permutation groups; Lagrange's theorem: applications to number theory, kernel, isomorphisms, normal subgroups, quotient groups; Sylow's theorems; Group of isometries; group of transformations, enlargements; Group of similarities; Rings: definition; integral domain, fields.

Prerequisites: MS4021, MS4022

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**Rationale and Purpose of the Module:** To develop and understanding of the theory of differential equations.

To study standard solution techniques.

To apply differential equations to real situations.

**Syllabus:**
Basic concepts: order, degree, solution, boundary and initial conditions, graphs of solutions; Mathematical modelling: examples from mechanics and population growth; Classical mechanics: velocity, acceleration, motion of a rigid body; Newton's Laws, simple harmonic motion, elastic strings and springs; Projectile motion and orbital motion; First order ODEs: variable separable, homogeneous, linear and exact with applications; Second order differential equations: linear with constant coefficients, trial method and D-operator method with applications; Numerical solution of first order differential equations: Euler to Runge-Kutta.

Prerequisites: MA4702

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**MD4022 - INTRO TO TRADITIONAL MUSIC AND DANCE STUDIES 2**
ECTS Credits: 6

**Humanities**

**Rationale and Purpose of the Module:** To introduce students to the history and structures (musical and in a wider cultural sense) of traditional Irish music and dance.

**Syllabus:** Issues addressed in this module will be instrumental and dance style, Irish language song tradition, nineteenth-century collections, contemporary issues, sean-nós and set dancing.

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**MD4024 - IRISH TRADITIONAL MUSIC AND DANCE STUDIES 2**
ECTS Credits: 6

**Humanities**

**Rationale and Purpose of the Module:** To expose the students to a deeper understanding of the history and nature of the Irish music, song and dance traditions.

**Syllabus:** This module involves a deeper examination of
key issues and moments in the historical development of traditional music and dance practice and their study, particularly relating to the position of the song tradition in the past century, the acquisition of the forms of dance music and the documentation of dance in Ireland.

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**MD4026 - IRISH TRADITIONAL MUSIC AND DANCE STUDIES 3**
ECTS Credits: 6

**Humanities**

**Rationale and Purpose of the Module:** To provide a deeper understanding of the historical development of these Irish traditions. To apply cultural theory to Irish Music and Dance Studies.

**Syllabus:** The main subject areas to be addressed are Irish Language Song; Repertoires in Irish Traditional Music and Dance Practice; Contemporary Developments in Traditional Instrumental Music and Dance. These are to be addressed using a thematic approach which will engage theoretical areas such as identity, ethnicity, globalisation and the meaning of tradition.

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**MD4028 - IRISH TRADITIONAL MUSIC AND DANCE STUDIES 5**
ECTS Credits: 6

**Humanities**

**Rationale and Purpose of the Module:** The development and completion 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.

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**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.

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**MD4032 - CONTEXTUALISING AND VOCATIONAL STUDIES 2**
ECTS Credits: 6

**Humanities**

**Rationale and Purpose of the Module:**
Contextualizing and Vocational Studies 2 History of Western Art Music and Dance. The aim of this module is to provide an understanding of art music and dance that will not only be especially helpful in primary and second level teaching contexts but will also introduce students to crucial music-historical concepts and terminology that they will deploy elsewhere

**Syllabus:** This course will act as an introduction to the historical development of Western Art Music from its roots in medieval church and secular music to its contemporary forms. Its historical relationship to traditional musics in Europe and beyond will be discussed.
Dance traditions will also be explored, referencing classical, neo-classical, contemporary and post-modern dance artists and practices. The course will include the history of dance performance in other locations and environments, for example site specific works, choreography for camera and the influence of new technologies on the development of choreography and performance.

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**MD4034 - CONTEXTUALISING AND VOCATIONAL STUDIES 3**
ECTS Credits: 6

**Humanities**

**Rationale and Purpose of the Module:** This module is designed to help competent musicians and dancers to come to an understanding of what it means to be involved in music and dance education contexts.

**Syllabus:** There are three main components: Music and Dance Curriculum studies, Professional Studies and School Based Work. The first priority is to help the development of expertise in a variety of educative situations. These range from classroom activities for various age groups and abilities to instrumental teaching, classroom teaching, ensemble, choral, band and orchestral rehearsals, and the passing on of traditional and/or ethnic and world musics and dance. There is also an introduction to Community Music and Dance which involves the development of acquired skills in a community music and dance context and as community musicians and dancers.

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**MD4036 - CONTEXTUALISING AND VOCATIONAL STUDIES 5**
ECTS Credits: 6

**Humanities**

**Rationale and Purpose of the Module:** To introduce students to the important contextualising disciplines of ethnomusicology and ethnochoreology as well as digital audio and visual technologies associated with music and dance performance, with a focus on professional audio and video recording and editing software.

**Syllabus:** This module will examine the historical development of the two academic disciplines of ethnomusicology and ethnochoreology over the past 150 years and their main principles and orientations as well as the practical application of fieldwork and the production of ethnomusicological representations. It will also examine the creative and analytical possibilities of digital technologies associated with music and dance performance, with a focus on editing techniques.
MD4038 - CONTEXTUALISING AND VOCATIONAL STUDIES 7
ECTS Credits: 6

Humanities

Rationale and Purpose of the Module: To introduce the professional disciplines of music psychology and therapy to the students and to develop a vocational project relevant to the potential future professional experience of the student, involving one or a combination of educational, community music / dance, technology, business orientations.

Syllabus: In the first part of the module an overview of the principles and research base relating to the psychology and sociology of music and dance will be presented through lectures and seminars; in particular, human responses to music and/or dance in affective, physiological, emotional and psychological domains. Current research relating to dance participation and performance, music listening, music preference, music for relaxation, music and dance in public spaces, responses to participation and observation of dance and ambient music, will be presented and critiqued.

In the second part of the module students will engage in a self-directed project relating to the application of vocational aspects of performance that have been addressed through the course (education, community music / dance, technology, business)

MD4042 - PERFORMANCE STUDIES 2: RESEARCH METHODS
ECTS Credits: 6

Humanities

Rationale and Purpose of the Module: To introduce students to research methods developed within performance studies to facilitate study of the performing arts; to engage with discourse and debate around performance as research and research as performance and to encourage students to develop their own approach to the integration of creative and reflective practices.

Syllabus: An introduction to research methods in performance studies including performance ethnography, ethnographic representative, participatory action research, autoethnography, personal narrative and reflexivity, as well as performance-based strategies including vocal and movement improvisation, performance as dialogue and ritual as research.

MD4048 - PERFORMANCE STUDIES 6: PERFORMANCE STUDIES SEMINAR / FYP
ECTS Credits: 6

Humanities

Rationale and Purpose of the Module: To introduce students to independent research in performance studies through engagement with its primary research journal, TDR: The Journal of Performance Studies, in the form of lecture / seminars, including presentations on relevant articles, performance presentations and the presentation of new research.

Syllabus: An engagement with current scholarship in performance studies, primarily through an exploration of relevant articles in TDR: The Performance Studies Journal, as well as engaging in independent research, through scholarship, performance and reflection.

MD4052 - NATIVE MUSIC AND DANCE TRADITIONS OF IRELAND
ECTS Credits: 6

Humanities

Rationale and Purpose of the Module: To introduce the students to the history and structures (musical and in a wider cultural sense) of traditional Irish music and dance.

Syllabus: The syllabus is a development of the existing Introduction to Irish Traditional Music and Dance Studies 1 and 2, offered as part of the first year of the BA Irish Music and Dance programme. 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; ceilidh dancing; instrumental and dance style; Irish language song tradition; nineteenth-century collections of Irish traditional music; contemporary issues; sean-nós and set dancing. An important part of this module will be the weekly tutorials in Irish traditional music, giving the students a practical engagement with the tradition.

MD4054 - PERFORMANCE STUDIES 4: RITUAL STUDIES SEMINAR
ECTS Credits: 6

Humanities

Rationale and Purpose of the Module: To introduce students to research in ritual studies through engagement with its primary research journal, Journal in Ritual Studies, in the form of lecture / seminars, including presentations on relevant articles, performance presentations and the presentation of new research.

Syllabus: Building on the theoretical foundation of Performance Studies 3, in which students were introduced to the primary principles and research methods of ritual studies, this module will explore the discipline further through a more in-depth engagement with its research outputs as exemplified in the Journal of Ritual Studies; presentations of current research will include lecture/seminar presentations involving analysis of current research, creative performance as research and research generated by students through their own performance practices

MD4094 - MUSIC, LANGUAGE, SIGN AND TEXT
ECTS Credits: 6

Humanities

Rationale and Purpose of the Module: To develop the student’s critical understanding of the relationship of language, signs and symbols to music. This will allow students to engage their academic studies in the field of performing arts in a more critical and informed manner.

Syllabus: In this module students will be introduced to the broad twentieth-century traditions of structuralism, post-structuralism, post-modernism and cognitive linguistics. They will examine the application of theoretical structures from these traditions, in particular those promoted by Saussure, Barthes, Foucault, Bakhtin, Kristeva, Lakoff, Turner and Foucault, in the contexts of understanding roles of meaning and the
interaction of sign, text and language in musical and musicological contexts. Students will be encouraged to examine these theoretical constructs in the constructs of their own performance practices. Students will be provided with written feedback according to BA Irish Music and Dance policy.

ME4002 - INTRODUCTION TO ENGINEERING 2
ECTS Credits: 6

Mechanical, Aeronautical and Biomedical Engineering

Rationale and Purpose of the Module: To develop oral presentation and teamwork skills, encourage a spirit of research and self-study, and provide students with an introduction to the processes by which engineering components are made as well as introducing them to sustainability as an engineering topic.

Syllabus: Oral presentation techniques and use of information technology; teamwork skills; metal casting processes; shaping processes for plastics: extrusion, injection moulding, compression moulding, blow moulding, thermoforming; shaping processes for polymer matrix composites: open moulds, closed moulds; powder metallurgy and processing of ceramics; metal forming; material removal processes; heat treatments; surface treatments; joining; mechanical assembly; rapid prototyping; microfabrication processes; quality control, measurement and inspection; manufacturing systems; sustainability.

Prerequisites: ME4001

ME4101 - AIRCRAFT MECHANICS
ECTS Credits: 3

Mechanical, Aeronautical and Biomedical Engineering

Rationale and Purpose of the Module: To develop, in the students, an ability to apply the principles of applied mechanics to typical aircraft mechanisms.


Prerequisites: ME4111, ME4112

ME4111 - AIRCRAFT VIBRATIONS
ECTS Credits: 6

Mechanical, Aeronautical and Biomedical Engineering

Rationale and Purpose of the Module: To provide an appreciation of the critical design issues associated with vibrations in structures and devices, with an emphasis on applications in aircraft. To enable students to analyse vibrational problems with standard mathematical tools for linear systems, and design simple vibration absorption and isolation systems.

Syllabus: Oscillatory motion; free vibration of single degree of freedom systems; harmonically excited vibration; transient vibration; vibrations under general forcing conditions; systems with two or more degrees of freedom; modal analysis; introduction to aeroelasticity.

Prerequisites: ME4111, ME4112

ME4112 - ENGINEERING MECHANICS 2
ECTS Credits: 6

Mechanical, Aeronautical and Biomedical Engineering

Rationale and Purpose of the Module: The overall objective of the course is to enable students to apply Newtons Laws of Motion (in particular the second law) to objects in motion with non-zero acceleration. The course thus goes beyond the topic of statics, which was examined in Engineering Mechanics 1 (ME4111), and analyses the kinematics of bodies in motion, the rules used to describe the motion of bodies in space, and the kinetics, which relates the motion of bodies to the forces which give rise to the motion. The study of accelerating bodies is often referred to as Dynamics, as opposed to the study of bodies in equilibrium, which is referred to as Statics.

Syllabus: Application of Newtons Laws to particles and rigid bodies not in equilibrium (Dynamics) Kinematics of particles, rectilinear and curvilinear motion, Cartesian, polar, normal and tangential co-ordinates; relative motion. Kinetics of particles, work, kinetic energy and potential energy, impulse and momentum. Collections of particles, moment of inertia. Kinematics of rigid bodies in plane motion, rolling wheels, mechanisms. Kinetics of rigid bodies in plane motion, translation of rigid bodies, rotation about a fixed point and general plane motion

Prerequisites: ME4111

ME4226 - MECHANICS OF SOLIDS 2
ECTS Credits: 6

Mechanical, Aeronautical and Biomedical Engineering

Rationale and Purpose of the Module: To understand
Rationale and Purpose of the Module: To introduce the nature of fluids, the dynamic behavior of fluids and application of the principles of continuity, energy and momentum to viscous fluid flow.

**Syllabus:** Characteristics and Properties of Fluids. Fluid Statics and Manometry. Principles of Continuity, Momentum and Energy conservation applied to fluid dynamics, e.g. Drag of a Two-Dimensional Body. Boundary Layer theory with applications to smooth and rough pipes. Effect of pressure gradient on boundary layer. Flow over flat plate and airfoil sections. Drag, lift and dependence on Airfoil Section geometry.

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**ME4328 - AIRCRAFT MAINTENANCE**  
**ECTS Credits:** 3

**Mechanical, Aeronautical and Biomedical Engineering**

Rationale and Purpose of the Module: To give a basic appreciation for hard tissue replacement materials in current use; To enable students to understand material selection and design criteria for hard tissue replacement applications; Gain understanding of regulatory environment.

**Syllabus:** Materials for hard tissue orthopaedic materials, survey of applications (TJ, substitution, fixation) alloys bone cements, substitutes (bioactive and resorbable). Dental implant applications and materials Dental restorative materials Regulatory affairs: 93/42/EEC, MDD, FDA, EN46000, AIMDD, IVDD and related standards.

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**ME4412 - FLUIDS MECHANICS 1**  
**ECTS Credits:** 6

**Mechanical, Aeronautical and Biomedical Engineering**

Rationale and Purpose of the Module: To give a basic appreciation for hard tissue replacement materials in current use; To enable students to understand material selection and design criteria for hard tissue replacement applications; Gain understanding of regulatory environment.

**Syllabus:** Materials for hard tissue orthopaedic materials, survey of applications (TJ, substitution, fixation) alloys bone cements, substitutes (bioactive and resorbable). Dental implant applications and materials Dental restorative materials Regulatory affairs: 93/42/EEC, MDD, FDA, EN46000, AIMDD, IVDD and related standards.

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**ME4414 - FLUIDS MECHANICS 2**  
**ECTS Credits:** 6

**Mechanical, Aeronautical and Biomedical Engineering**

Rationale and Purpose of the Module: To apply the principles of Continuity, Energy and Momentum covered in Fluid Mechanics 1 to dimensional analysis and similarity, viscous flow, inviscid flow, circular motion, hydraulic machines and compressible flow.

**Syllabus:** Dimensional analysis and dynamic similarity with applications; inviscid flow theory and applications; vortex motion; analysis and performance evaluation of turbines, fans and pumps; selection of hydraulic machines from specific property requirements; Navier-Stokes equations with applications, lubrication theory; compressible flow. Channel flow.

**Prerequisites:** ME4412

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**ME4417 - BOUNDARY LAYER THEORY**  
**ECTS Credits:** 6

**Mechanical, Aeronautical and Biomedical Engineering**

Rationale and Purpose of the Module: To advance the knowledge of the students of fluid flow, aerodynamics and convective heat transfer.

**Rationale and Purpose of the Module:** To give the student a comprehensive understanding of incompressible flow with an introduction to compressible flow with application to aircraft.

**Syllabus:** Review of governing equations, application of equations to fluid flow processes
Thin aerfoil 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, aerfoils in compressible flow
Introduction to experimental techniques

Prerequisites: ME4412

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**ME4424 - AERODYNAMICS 1**
ECTS Credits: 6

**Mechanical, Aeronautical and Biomedical Engineering**

**Rationale and Purpose of the Module:** To give the student a comprehensive understanding of incompressible flow with an introduction to compressible flow with application to aircraft.

**Syllabus:** Review of governing equations, application of equations to fluid flow processes
Thin aerfoil 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, aerfoils in compressible flow
Introduction to experimental techniques

Prerequisites: ME4412

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**ME4456 - THERMODYNAMICS 2**
ECTS Credits: 6

**Mechanical, Aeronautical and Biomedical Engineering**

**Rationale and Purpose of the Module:** To provide an understanding of the mode of operation for actual heat pump and refrigeration systems and to analyse their performance characteristics.
To provide an understanding of the mode of operation of Rankine, superheat, reheat and regenerative steam power cycles and to analyse their performance characteristics.
To analyse the power output characteristics of pure impulse turbines and impulse-reaction axial flow turbines. To relate the performance and characteristics of the latter to steam enthalpy change in multi-stage operation.
To analyse the power input requirements, volumetric efficiency and heat loss characteristics for single stage and multi-stage compressors.
To provide an understanding of the mode of operation for actual 2-stroke and 4-stroke spark ignition and compression ignition engines and to analyse their performance characteristics with reference to mean effective pressure, indicated power, brake power, specific fuel consumption, volumetric efficiency, thermal efficiency and their Applications

**Syllabus:** Axial and Radial Flow Turbines and Compressors.
Reciprocating expanders and compressors.
Vapour Power Cycles.
Gas Turbine Cycles.

Performance of Internal Combustion Engines.

Prerequisites: ME4423

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**ME4523 - THERMODYNAMICS 1**
ECTS Credits: 6

**Mechanical, Aeronautical and Biomedical 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


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**ME4526 - INTRODUCTION TO HEAT TRANSFER**
ECTS Credits: 6

**Mechanical, Aeronautical and Biomedical Engineering**

**Rationale and Purpose of the Module:** To provide a basis to students in the concepts and solution methods of conduction, convection and radiative heat transfer, and the measurement techniques utilised in heat transfer

**Syllabus:** Fourier’s Law of Heat Conduction
The Convection Equation
Thermal Resistance’s and their Application
Two-dimensional Heat Conduction: An Analytical Example
Numerical Methods in Heat Conduction
Time Varying Heat Transfer: The Lumped Heat Capacity Method
Forced Convection: Standard Heat Transfer Correlation’s and their Application
Free Convection: Standard Heat Transfer Correlation’s and their Applications
Thermal Radiation: An Introduction
Heat Exchange Design Equations: The Log Mean Temperature Difference

Prerequisites: ME4412

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**ME4528 - PROPULSION SYSTEMS**
ECTS Credits: 6

**Mechanical, Aeronautical and Biomedical Engineering**

**Rationale and Purpose of the Module:** To provide students with fundamental knowledge about aircraft propulsion systems, particularly the air-breathing jet engine. Students should attain understanding of the thermodynamics and mechanics of the engine as a whole as well as individual components.

**Syllabus:** An overview of propulsion systems and the development of thrust. A review of the conservation equations of fluid mechanics. The thrust equation. Propulsion efficiencies and implications for system design. A review of compressible fluid flow covering isentropic flow through ducts, constant area heat transfer and shock wave formation. The thermodynamic design of air-breathing engines covering the ramjet, the turbojet, the turbofan and the turboprop. Typical engine performance and aircraft matching. Detailed aerothermodynamic design of intakes, combustion chambers and exhaust nozzles. Detailed internal design of compressors and turbines covering two-dimensional blade row velocity diagrams, boundary layer flow and performance limitations.

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**ME4616 - FINITE ELEMENT ANALYSIS**
ECTS Credits: 6

**Mechanical, Aeronautical and Biomedical 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.


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**ME4714 - INSTRUMENTATION AND CONTROL**
ECTS Credits: 6

**Mechanical, Aeronautical and Biomedical 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.

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**ME4718 - FLUID PROCESS CONTROL**
ECTS Credits: 6

**Mechanical, Aeronautical and Biomedical Engineering**

**Rationale and Purpose of the Module:** To provide the student with a very good knowledge of advanced process control with emphasis on fluid & thermal processes.

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**ME4726 - FLIGHT MECHANICS**
ECTS Credits: 6

**Mechanical, Aeronautical and Biomedical Engineering**

**Rationale and Purpose of the Module:** To introduce the student to aircraft performance and the static and dynamic stability and control of aircraft.

**Syllabus:** International Standard Atmosphere, Aircraft speed and height conventions. Aircraft engine thrust and drag characteristics, parabolic drag polar. Aircraft performance in steady, climbing and turning flight. Range and endurance equations (including Breguet equations) for piston and turbine powered aircraft. Prediction of takeoff and landing distances. Longitudinal static stability, stick-fixed and stick-free stability margins. Manoeuvre point and manoeuvre margin. Introduction to dynamic stability, stability modes

**Prerequisites:** ME4424, ME4412

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**ME4736 - PHYSIOLOGICAL FLUID MECHANICS 1**
ECTS Credits: 6

**Mechanical, Aeronautical and Biomedical Engineering**

**Rationale and Purpose of the Module:** To introduce the students to the field of physiological fluid mechanics, develop their knowledge of physiological fluid flows including airflow, blood flow and urology, study these flows in straight, rigid and compliant tubes and examine transport phenomena in biological systems, viscous flow, inviscid flow.
Syllabus: Viscous and inviscid flow theory and applications. The role of transport phenomena in biological systems and the definition of these processes, including momentum, convection, diffusion and binding interactions. Introduction to the primary physiological convective transport systems: cardiovascular system, respiratory system, urological and lymph systems. Properties of physiological fluids and constitutive relations; Newtons law of viscosity, non-Newtonian rheology and time dependant viscoelastic behaviour. The derivation of the conservation relations for fluid transport, dimensional analysis and scaling. Introduction to Mass Transfer, Ficks law of diffusion. Transport of Gases between blood and tissues: oxygen-haemoglobin equilibria and the dynamics of oxygenation of blood in lung capillaries.

Prerequisites: ME4412

ECTS Credits: 6

Mechanical, Aeronautical and Biomedical Engineering

Rationale and Purpose of the Module: To expose the student to the practical application of design, materials, mechanics and strength of materials theory. The work will focus on the appropriate use of Standards, Charts and Design Guides illustrating the often times empirical nature of applied engineering tasks. Underpinning each topic will be constant reference to the evolution of the practices and their relationship to current theory. In particular, there will be constant reference to the life and reliability to be expected from solutions.


Prerequisites: ME4807

ECTS Credits: 6

ME6001 - FUNDAMENTALS OF CONTINUUM MECHANICS

Mechanical, Aeronautical and Biomedical 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.
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.

**MF4728 - OCCUPATIONAL PSYCHOLOGY**
ECTS Credits: 6

Design and Manufacturing Technology

Rationale and Purpose of the Module: Engineers usually have to accept managerial positions, for which skills, knowledge and methods of occupational psychology are useful.

Syllabus: Students are encouraged to present and reflect on their own work experience, including co-op, and to be able to present relevant research to their peers.

**MF4756 - PRODUCT DESIGN AND MODELLING**
ECTS Credits: 6

Design and Manufacturing Technology

Rationale and Purpose of the Module: 3D parametric modelling systems are an integral part of the product design process. They are typically used to control key aspects of a product such as its design, communication, management, presentation, documentation and validation.

The aim of this module is to introduce students to these six key product design areas using SolidWorks in the context of generic best practice modelling strategies. In addition students will:
Understand the primary issues and considerations involved in designing a new product and develop a creative approach to the solution of design problems.
Understand the concepts and practices associated with 3D parametric modelling and visualisation technology.
Model and develop products and components in contemporary computer modelling software.
Be able to create comprehensive product models and specifications in the context of the total development of a product.
Develop cognitive modelling/visualisation, problems-solving and decision-making skills.

Syllabus: Problem definition and clarification - design briefs; New Product Development (NPD) Concurrent Engineering NPD vs Traditional NPD; The deliverables of processes of design; design processes and the role of parametric CAD; Modelling strategies from cognition to prototype; Creative Design Methods; Product Concepts Surface modelling and solid modelling techniques; design intent: planning parts for design flexibility; relations and equations; parametric dimensions; design and modelling for manufacture and assembly; assembly modelling; drawings; drawing documentation; BOMs; creating design tables using Excel for multiple part and assembly configurations; Library features: SolidWorks Toolbox of fasteners and components; importing and exporting files; CAD standards for data exchange; STL files and the FDM rapid prototyping system; linking with SolidCAM.
FEA analysis and design validation; rendering and presentation techniques; product animation.

Prerequisites: MF4722

**MF4768 - ERGONOMICS**
ECTS Credits: 6

Design and Manufacturing Technology

Rationale and Purpose of the Module: To extend earlier work in design and layout of workplaces.
To study the topics of person/machine interface design and workplace design from an ergonomics viewpoint.
To counter the effects of adverse industrial environments.
To reduce error rates and accidents.

Syllabus: Ergonomics approach.
Muscular stress: energy liberation, circulatory system, physical work ability (VO2), muscle contractions.
Information exchange: information theory, info processing, visual characteristics of H.O., controls and console design.
Postures: anthropometry, static work, posture description, posture improvement, cumulative trauma disorders.
Hand tools: design, problems, vibration white finger.
Systems environment: heat accumulation, Givoni and Goldman equations, lighting terms and requirements, noise effects and countermeasures.

**MG4037 - STRATEGIC MANAGEMENT**
ECTS Credits: 6

Management and Marketing

Rationale and Purpose of the Module: To provide students with a significant understanding of the role and importance of strategic management in contemporary organisations.
To enable students to integrate functional specialisms into an appreciation and application of strategy processes in both the private and public sector.

Syllabus: Multi-perspective nature of strategy, strategic dimensions, strategy processes, theories of business level competitive advantage - market positioning, resource-based and the dynamic capabilities approach.
Strategic options and decision making, implementation issues: resource allocation, stakeholder management, strategic control, and change management.
Strategic cultures and paradigms, the role of the strategist.
Corporate-level strategy, multi-business structures and coherence, Organisational and Environmental Turbulence, Scenario Planning and future thinking.

**MG4058 - MANAGEMENT CONSULTING**
ECTS Credits: 6

Management and Marketing

Rationale and Purpose of the Module: Contemporary management practice is a novel and action orientated module on the minor option in management for the BBS Degree.
The module takes a management practice view of current, and hence annually updated, topical problems/challenges in business (private and public sector). Students will be introduced to some of the techniques used by leading edge organizations and consultants to develop and implement, value added management interventions.

Syllabus: Practitioner and consultant management methodologies, e.g. strategy workshops, strategy
Develop planning processes for the strategic use of the organisational transformation.

Develop the role played by information and technology in organisations.

Rationale and Purpose of the Module:

Management and Marketing

ECTS Credits: 6

MG4604 - AIR TRANSPORTATION

Rationale and Purpose of the Module: To provide students with an appreciation and analysis of the air transport industry structure, competition, technical and commercial issues facing companies involved in the sector, complimenting existing knowledge of aeronautical engineering:

Syllabus:
Overview of the international aviation industry including air transport, airports, aerospace manufacturing, maintenance and other aviation services. History of aviation including the development of national and international regulations of civil aviation. The advent of deregulation and liberalization of air transport markets to produce open skies. The characteristics of airline operations, airline costs, passenger demand, marketing strategies and pricing fare policies. The use of gantt charts, bills of material (BOM) and the principles of FIFO within the air transport sector. Air transport in Ireland and the current international air transport industry structure, competition, emerging trends and future prospects.

MI4408 - STRATEGY AND KNOWLEDGE MANAGEMENT

ECTS Credits: 6

Management and Marketing

Rationale and Purpose of the Module: To provide a strategic perspective on the role of knowledge, information and technology in organisations. Develop the role played by technology in market and organisational transformation. Develop planning processes for the strategic use of the information resource.

Syllabus: To provide students with an appreciation of the need to manage knowledge as an organisational resource and the infrastructural requirements to facilitate this.

Syllabus: The role of technology, information and knowledge in a strategic context; technological change and the transformation of organisations and markets in the networked economy; techniques and frameworks for strategic planning of the information resource; the nature of knowledge as an organizational capability; models and conceptual frameworks for knowledge management; knowledge management systems; knowledge codification; the transfer of knowledge at an individual, group, organizational and inter-organizational level; cross cultural knowledge management; changing use of systems due to knowledge intensity; communities of knowing; implications for knowledge systems in support of non-traditional/emerging organizational structures. The above concepts will be reinforced and developed through the use of various software packages including web, intranet and knowledge portal software systems.

Prerequisites: MI4407

MK4002 - MARKETING

ECTS Credits: 6

Management and Marketing

Rationale and Purpose of the Module: This module is designed to introduce students to the philosophy and historical underpinnings of marketing. As such, it will help students to position marketing both as an organisational discipline and as a societal force. The module will trace the development of marketing as a business philosophy and will assess the role of marketing within the international business organisation. Students will also explore what it means for organisations to be market-led. Finally, the module will delineate the rights and responsibilities of marketers and customers, and identify the role and impact of marketing in society.

Syllabus: The syllabus provides coverage of the nature of marketing and, in particular, offers an historical backdrop to the development of the discipline. Next, students are introduced to the cornerstones of the discipline in the guise of the marketing concept and the marketing mix. Issues relating to marketing as organisational culture are considered with specific reference to marketing orientation and the barriers to developing such an orientation. The process of marketing in different contexts (service, industrial, international etc.) is discussed and differences highlighted. The consumer is introduced as the core target of marketing activity and relevant issues such as consumer sovereignty; consumer rights and the consumer movement are debated. On a macro level, issues relating to social responsibility and ethics are delineated. Finally, the module addresses the thorny issue of how marketing adds value and what its contribution might be.

Prerequisites: MK4002

MK4004 - CONSUMPTION AND CONSUMER CULTURE

ECTS Credits: 6

Management and Marketing

Rationale and Purpose of the Module: This course aims to provide coverage of the nature of consumer culture.

* To reflect the general shift within consumer culture in the basic emphasis of economic systems from exchange or production to consumption.
* To define the domain of consumer behaviour, including some areas of interest to consumer behaviour researchers, policymakers, and marketers.
* To provide coverage of the circle of consumption and how consumption relates to other technological and economic processes.
* To explore contemporary theories of consumption.
* To encourage students to critically reflect upon their own consumption.

Syllabus: The Circle of Consumption; Motivational Dynamics; Culture; Cultural Values; Myths & Symbols; Cultural Rituals; Types of Meanings; Meaning Transfer; Strategic Analysis of Consumers; Self Concept; Subcultures of Consumption; Lifestyles; Embodiment & Consumption; Classic Theories of Motivation; Consumer Motives in Cultural Perspective; Involvement; Consumer Experience; Consumer Learning; Purchasing; Gift Exchange; Organisational Consumption; Family & Household Consumption; The Social Context of Personal Consumption; Tools of Influence; Reference Groups; Innovation; Adoption and Diffusion; Resistance; Compulsive Consumption; The Disposition Process; Profiles of Disposition Behaviours; Factors Affecting Disposal Choices.

Prerequisites: MI4407
MK4006 - MARKETING MANAGEMENT (NON BUSINESS)
ECTS Credits: 6

Management and Marketing

Rationale and Purpose of the Module: This module will provide non business students with an understanding of the key knowledge and skills involved in marketing management. The module will examine the strategic importance of marketing and explore the key challenges and contemporary issues surrounding the management of marketing.

The key objectives are:
1. To explore the role of marketing management in the contemporary environment and investigate how marketers can manage environmental changes
2. To evaluate marketing's contribution in the creation of sustainable competitive advantage for different business contexts
3. To investigate the importance of marketing within the firm and the challenges surrounding the management of the marketing function
4. To provide students with an understanding of the role of marketing planning and implementation.

Syllabus: Building upon the foundations of marketing, this module takes a strategic approach to the theory and practice of marketing. The module introduces the concept of the marketing vision and explores the processes of strategic analysis based on an assessment of external and internal forces affecting the firm. An exploration of marketing strategy and the sources of competitive advantage follow with key competitive positioning strategies presented. The module focuses on understanding the management of the marketing function, the development of the marketing mix and the practice of marketing in terms of maximising value to customers and other stakeholders. Core areas to marketing management such as customer behaviour, brand management, services management and relationship marketing are examined. Key models and theories related to marketing planning and implementation are explored.

Prerequisites: MK4603

MK4014 - BRANDING
ECTS Credits: 6

Management and Marketing

Rationale and Purpose of the Module: The syllabus presents, in the first instance, a review of the history and origins of branding. This provides context for the subsequent discussion of the role and importance of branding. Next, students are introduced to the processes of segmentation, targeting and positioning. Brand building activities are reviewed with consideration given to strategic brand management, comparative analyses of brand image and brand concept, and an exploration of brands as assets. Finally, branding in discussed in terms of how it relates to different marketing contexts: service brands; industrial brands; retailer brands; international brands and corporate brands.

Prerequisites: MK4002

MK4018 - INTERACTION, RELATIONSHIPS AND NETWORKS
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.
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

MS4014 - INTRODUCTION TO NUMERICAL ANALYSIS
ECTS Credits: 6

Mathematics & Statistics

Rationale and Purpose of the Module: This module provides an introduction to the basic concepts of numerical analysis.

Syllabus: Propagation of floating point error;

Zeros of nonlinear functions: Bisection method, Newton/Es method, Secant method, fixed point method; convergence criteria, rate of convergence, effect of multiplicity of zero; introduction to the use of Newton/Es method for systems of nonlinear equations.

Systems of linear equations: Gauss elimination, LU and Cholesky factorisation, ill-conditioning, condition number; iterative methods: Jacobi, Gauss-Seidel, SOR, convergence criterion.

Interpolation and Quadrature: Lagrange interpolation, error formula;

Newton-Cotes and Romberg quadrature.


Prerequisites: MS4022, MS4403

MS4018 - DYNAMICAL SYSTEMS
ECTS Credits: 6

Mathematics & Statistics

Rationale and Purpose of the Module: To demonstrate to the student how dynamical techniques can be applied to the analysis of nonlinear and chaotic models, data and systems.

Syllabus: One dimensional flows: flows on the line, fixed points and stability; bifurcations, flows on the circle.


Chaos : Lorenz equations; strange attractors; control of chaos.

One dimensional maps : fixed points, periodic points and stability; bifurcations, the logistic map - numercs and analysis, period-doubling and intermittency; Lyapunov exponents, renormalisation and Feigenbaum numbers.

Introduction to time series applications.

Fractals : dimensions; strange attractors revisited.

Prerequisites: MS4403

MS4022 - CALCULUS 2
ECTS Credits: 6

Mathematics & Statistics

Rationale and Purpose of the Module: To introduce students to MATLAB and R as tools for mathematical and statistical computation.

indexing, array manipulation. Two-dimensional Graphics: basic plots, axes, multiple plots in a single figure, saving and printing figures. Matlab commands in öbatchî mode: script m-files, saving variables to a file, the diary function. Relational and logical operations: testing for equality/inequality, and/or/not. Control flow: for, while, if/else, case, try/catch. Function M-files: parameter passing mechanisms, global and local variables.


Applications of R û case studies in statistics: The applications of R will be explored by considering several case studies in statistics. Each case study is motivated by a scientific question that needs to be answered, and full background material is presented. The cases are grouped by broad statistical topics: data analysis; applied probability; statistical inference; regression methods.

Rationale and Purpose of the Module: Methods of stochastic dynamics applied to finance, and with reference to problems involving stochastic differential equations from physics and engineering.


Prerequisites: MS4213, MS4217

MS4034 - APPLIED DATA ANALYSIS
ECTS Credits: 6

Mathematics & Statistics

Rationale and Purpose of the Module: [Module replaces Numerical Computation MS4024]

This is a new module the aim of which is to give the students experience building and using statistical models to analyse real data and formulate conclusions based on interval estimates, hypothesis testing, model selection and comparison.

The module serves to integrate the practice and theory of statistics.

The instructor and students are expected to analyse the data provided with each lab in order to answer a scientific question posed by the original researchers who collected the data.

To answer a question, statistical methods are introduced, and the mathematical statistics underlying these methods are developed.

Syllabus: Descriptive statistics; quantile plots, normal approximation.

Simple random sampling; confidence intervals. Stratified sampling; parametric bootstrap allocation.

Estimation and testing; goodness-of-fit tests, information, asymptotic variance.

Contingency tables; experimental design. Poisson counts and rates; Mantel-Haenszel test.

Regression; prediction, replicate measurements, transformations, inverse regression, weighted regression.

Multiple linear regression; model checking, projections. Analysis of variance; unbalanced designs, indicator variables, factorial designs.

Prerequisites: MS4222

MS4028 - STOCHASTIC DIFFERENTIAL EQUATIONS FOR FINANCE
ECTS Credits: 6

Mathematics & Statistics

Rationale and Purpose of the Module: Methods of stochastic dynamics applied to finance, and with reference to problems involving stochastic differential equations from physics and engineering.
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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 $\mathbb{N}$, proof by induction, recursive definitions and algorithms, recurrence relations.

Representations of $\mathbb{N}$ (binary, octal, etc), other number "fields".

Introductory combinatorics, permutations, combinations.

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**MS4212 - FURTHER LINEAR ALGEBRA**  
ECTS Credits: 6

**Mathematics & Statistics**

**Rationale and Purpose of the Module:** Course restructuring in response to Project Maths.

The aim of this module is to build the student's understanding of Linear Algebra to a more advanced level. The module includes a formal treatment of Vector Spaces and Inner Product Spaces followed by a careful treatment of the properties of vectors and matrices on $\mathbb{R}^n$ and $\mathbb{C}^n$.

**Syllabus:** Axiomatic treatment of Vector Spaces and Inner Product Spaces.

- Linear Independence, spanning sets.
- Bases & Dimension.
- Inner products/norms.
- Angles/Orthogonality in Inner Product Spaces.
- Orthogonal bases/Gram Schmidt Orthogonalisation.
- Linear transformations/change of basis.

**Properties of matrices.**

- Rank, row space, column space, null space.
- Vector norms on $\mathbb{R}^n$ and $\mathbb{C}^n$.
- Existence and uniqueness of matrix inverse/relation to matrix rank.
- Fredholm Alternative.
- Unitary and Hermitian properties of matrices.

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**Eigenvalue & Eigenvector Topics.**

- Eigenvalue decomposition for Hermitian matrices.
- Algebraic & Geometric Multiplicity.
- Defective Eigenvalues and Matrices.
- Similarity Transformations.
- Diagonalisation/Unitary Diagonalisation.

- Induced matrix norms.

**Applications of the above topics.**

**Prerequisites:** MS4131

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**MS4214 - STATISTICAL INFEREN**

ECTS Credits: 6

**Mathematics & Statistics**

**Rationale and Purpose of the Module:** This course is designed to introduce students to the statistical basis behind model identification, model fitting and model criticism of time series probability models in both time and frequency domains.

**Syllabus:** Components of a time series; smoothing methods; trend projection; deseasonalising a time series; autocorrelation; autoregressive models; integrated models; estimation in the time domain; the
Box-Jenkins approach; spectral analysis, the spectral distribution function, the spectral density function, Fourier analysis, periodogram analysis, the fast Fourier transform; forecasting methods, extrapolation, Holt-Winters, Box-Jenkins, prediction theory; bivariate processes, the cross-correlation function, the cross-spectrum; applied time series analysis using suitable software packages.

MS4222 - INTRODUCTION TO PROBABILITY AND STATISTICS
ECTS Credits: 6

Mathematics & Statistics

Rationale and Purpose of the Module: This module replaces existing module MS4212 Introduction to Data Analysis. The focus of the previous module MS4212 was the analysis of data without a formal background in probability. The philosophy underpinning this approach was to introduce students to real data, which was entirely absent from Leaving Certificate mathematics in the 1990s, and begin to lay the foundations for the elements of data modelling necessary for the years three and four modules in the statistics options. Probability and Statistics account for 20% of the new Project Maths syllabus. Students now entering first year have had prior exposure to elementary data handling skills and experience applying the same basic ideas of probability. Consequently, it is not obvious that it is still necessary or desirable to adopt a teaching approach that separates the subject areas statistics and probability. As things stand, probability is totally absent from MS4212. One consequence of this omission is that statistical tools are introduced without proper formal theoretical justification based on probability models. Likewise, students are not as well prepared as they could be for the (rather packed) follow-on module MS4213. The intention in the revised (and renamed) first year introductory module is to include some probability in the syllabus. The strategy is to give students time to explore some of the many classical/famous problems that often arise in introductory probability. Discrete random variables and probability mass functions will be covered. As well as relieving some of the pressure in the congested semester 3 module MS4213, students will now be required to engage in more algebraic manipulation and basic mathematics. The statistical content of the module has been reconfigured to allow the inclusion of the material on probability.

Syllabus: Elementary Probability: permutations and combinations; axioms, rules of probability; conditional probability; independent events; probability trees; law of total probability; Bayes’ rule.

Discrete Random Variables: probability mass functions (Bernoulli, binomial, Poisson, geometric); expected value, variance; Poisson approximation to the binomial; law of total expectation (discrete form).

The Normal Curve: the normal curve as an idealised histogram; areas under the normal curve; normal probability plot; illustrating the sampling distribution of the mean through applications in statistical quality control; precision of an estimate; the foundations of hypothesis testing and confidence intervals.

Gathering Data: sample surveys; designed experiments and observational studies; randomized control trials. Exploratory Data Analysis: frequencies; histogram; empirical density curve; percentiles; measures of centre; measures of spread; outliers; boxplots; scatterplots; correlation; contingency tables, Simpson's Paradox.

Regression Models: least squares line; transforming to linearity; out-of-sample prediction.

MS4303 - OPERATIONS RESEARCH 1
ECTS Credits: 6

Mathematics & Statistics

Rationale and Purpose of the Module: The module will introduce OR and various standard techniques for decision-making. Linear programming will be covered in some depth. The student will be able to apply these techniques to realistic problems.

Syllabus: Model building and the methods of operational research. Linear programming - graphical interpretation, simplex method and sensitivity analysis. duality and the dual simplex method, Applications of linear programming - Transportation and assignment algorithms, zero-sum games. Critical path analysis - minimum completion time, resource constraints and resource levelling, probabilistic task durations.

Decision analysis - decision trees, expected value, utility, Bayesian approach.

Prerequisites: MS4213

MS4327 - OPTIMISATION
ECTS Credits: 6

Mathematics & Statistics

Rationale and Purpose of the Module: To give students a broad understanding of the theoretical and numerical aspects of non-linear optimisation.


Constrained Optimisation. Penalty and Barrier Function Methods. Computational limitations of penalty function methods - ill-conditioning. Exact Penalty Function Methods. The module will include at least one computer-based project requiring students to select and implement a suitable algorithm for the solution of a non-trivial optimisation problem using either Fortran or Matlab.

MS4404 - PARTIAL DIFFERENTIAL EQUATIONS
ECTS Credits: 6

Mathematics & Statistics

Rationale and Purpose of the Module: To introduce the partial differential equations of applied mathematics and physics with some standard solutions and applications.
**Syllabus:** [Introduction to PDEs:] Introduction to the partial differential equation of physics; classification of second order linear partial differential equations (hyperbolic, parabolic, elliptic).

**Rationale and Purpose of the Module:** To introduce the theory and applications of first order linear and nonlinear partial differential equations of mathematical physics.

**Syllabus:** Review of modelling skills, applications from: classical models (e.g. heat transfer), continuum models, financial models, statistical models, mathematical biology, advanced models.

**Prerequisites:** MS4404, MS4407, MS4403

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**MS4414 - THEORETICAL MECHANICS**

**ECTS Credits:** 6

**Mathematics & Statistics**

**Rationale and Purpose of the Module:** To introduce students to the fundamental concepts of theoretical mechanics.

To prepare students by developing the basic mathematical skills in theoretical mechanics.

To emphasise applications of vector calculus and ODEs.

**Syllabus:** Kinematics: reference frames, motion in one dimension, motion with constant acceleration, kinematics in three dimensions, uniform circular motion, centripetal acceleration

Dynamics: mass, force, NewtonÆs laws of motion, friction, NewtonÆs Law of Gravity, planetary motion

Conservation laws: momentum, angular momentum, energy (kinetic energy, potential energy as gradient of force)

Oscillatory motion: free and forced pendulum, resonance, parametric resonance

Introduction to the Hamiltonian and Lagrangian mechanics

**Prerequisites:** MS4403

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**MS4408 - MATHEMATICAL MODELLING**

**ECTS Credits:** 6

**Mathematics & Statistics**

**Rationale and Purpose of the Module:** To learn the techniques of advanced mathematical modeling or real phenomena with examples from the physical, biological, chemical and financial sciences.

**Syllabus:** Introduction to the Hamiltonian and Lagrangian mechanics

**Prerequisites:** MS4403, MS4613

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**MS4528 - MATHEMATICAL AND STATISTICAL MODELS OF INVESTMENTS**

**ECTS Credits:** 6

**Mathematics & Statistics**

**Rationale and Purpose of the Module:** The aim of this module is to equip the student with the necessary analytical and quantitative skills required for the pricing of interest rate products, credit default swaps, as well as to analyse the risk and return of individual assets and portfolios.

**Syllabus:** [Models of Fixed Income Securities and Interest Rate Options:] Interest rates, LIBOR, zero rate, forward rates, yield curve, duration, convexity; forwards and futures on currencies; immunization; interest rate swaps; boot-strapping the yield curve; currency swaps; interest rate derivatives: bond options, caps and floors, caplets and swaptions; BlackÆs models.

**[Credit Derivatives:]** Credit default swaps; hedge-based pricing. Collateralised debt obligations. Credit spreads and implied default probabilities. Bond based pricing of credit derivatives. Spread curves.

**[Time Series models of equity returns and volatility:]** Analysis of return series; tests for skewness and excess kurtosis; stationarity, ACF and PACF; brief survey of AR and MA models; models of volatility: ARCH and GARCH: kurtosis, forecasting; brief survey of variations on GARCH such as I-GARCH, M-GARCH; leverage effect and EGARCH.

**[Portfolio selection models:]** diversification; minimum variance and the Markowitz problem (vector treatment of n-asset problem); market portfolio; CAPM; systematic risk; CAPM as a pricing model; weaknesses of CAPM.

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**MT4002 - MATERIALS 1**

**ECTS Credits:** 6

**Civil Engineering and Materials Science**

**Rationale and Purpose of the Module:** This is a course in Engineering Materials for students with no previous back-ground in the subject. It is designed to meet the needs of engineering, science and design students for a first materials course, emphasizing design applications.

**Syllabus:** Introduction to engineering materials and their properties.

Price and availability of materials
The Elastic moduli (bonding between atoms, packing of atoms in solids, physical basis of YoungÆs modulus Yield strength, tensile strength and ductility (dislocations and yielding in crystals, strengthening methods and plasticity of polycrystals)
Fast fracture and toughness (micromechanisms of fast fracture)
Fatigue failure (fatigue of cracked and uncracked components, mechanisms, design against fatigue) Creep and creep fracture (kinetic theory of diffusion, mechanisms of creep and creep-resistant materials) Design with materials Case Studies and laboratory experiments incorporating examples of mechanical testing, failure analysis, design and materials selection.
MT4008 - PROPERTIES OF MATERIALS B
ECTS Credits: 6
Civil Engineering and Materials Science
Rationale and Purpose of the Module: To develop a sophisticated understanding of structure-property relationships in polymeric materials through consideration of the fundamental science underlying some important aspects of materials behaviour.

Syllabus: Transitions in polymers, first and second order. Explanations of Tg and Tm, crystal morphology, crystal growth and melting processes. Entanglement theories of polymers and application to melt rheology, diffusion, dissolution and fracture.

Theories of rubber elasticity. Natural and synthetic elastomers.

Creep in polymers, linear and non-linear viscoelasticity

Electrical properties, dielectric relaxation, electrical conduction.

Impact behaviour and fracture. Two phase polymer systems, thermodynamics and miscibility, blends and alloys. Commercially important materials.

Polymer stability, combustion, weathering, degradation and protection, physical ageing. Biodegradable materials.

Prerequisites: MT4013

MT4105 - QUALITY SYSTEMS
ECTS Credits: 6
Civil Engineering and Materials Science
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.
Inter-relationships between quality, reliability, price and delivery.
Quality Management Systems (QMS)
Introduction to ISO 9000
Introduction to ISO 19011
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

MT4208 - MATERIALS SELECTION AND DESIGN
ECTS Credits: 6
Civil Engineering and Materials Science
Rationale and Purpose of the Module: The student should be able to assess engineering components with regard to the design function. The student should be able to determine and use quantitative and qualitative materials selection criteria.

Syllabus: [The interaction between material properties and engineering design criteria, in designing components and products for manufacture]

MT4518 - SURFACE TECHNOLOGY
ECTS Credits: 6
Civil Engineering and Materials Science
Rationale and Purpose of the Module: To acquaint engineers and technologists with the concepts of corrosive degradation and wear processes and to give methodologies by which these processes can be decelerated by the use of electrochemistry coatings heat treatments or mechanical working.


MT4943 - MATERIALS PROCESSING
ECTS Credits: 6
Civil Engineering and Materials Science
Rationale and Purpose of the Module: To explain how properties and constraints are provided in practical systems that arise from the processing of materials. 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.
Inter-relationships between quality, reliability, price and delivery.
Quality Management Systems (QMS)
Introduction to ISO 9000
Introduction to ISO 19011
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

MT5001 - STRUCTURE OF MATERIALS
ECTS Credits: 6
Civil Engineering and Materials Science
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.

**Syllabus:** Metals (metal structures, equilibrium constitution and phase diagrams, case studies in phase diagrams, driving force for structural change, kinetics of structural change, diffusive transformations, nucleation, displacive transformations, light alloys, steels, alloy steels). Ceramics and glasses (structure of ceramics, mechanical properties of ceramics, cements and concretes). Polymers & composites (structure of polymers, mechanical behaviour of polymers, composites: fibrous, particulate and foamed, wood). Designing with metals, ceramics, polymers & composites. Case Studies and laboratory experiments incorporating examples of mechanical testing, failure analysis, design and materials selection.

**MU4136 - IRISH TRADITIONAL MUSIC 2**
ECTS Credits: 6

**Humanities**

**Rationale and Purpose of the Module:** To introduce the students to the history and structures (musical and in a wider cultural sense) of traditional Irish music and dance.

**Syllabus:** Issues addressed in this module will be instrumental and dance style, Irish language song tradition, nineteenth-century collections, contemporary issues, sean-nós and set dancing.

**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 sterilisation 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, CID, Cl. diff., TB, and MRSA. Immunology: the immune response reviewed; antibody diversity; allergy and anaphylactic shock; the immunosuppressed 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

**NS4002 - SCIENCE FOUNDATION 2 : GENETICS**
ECTS Credits: 3

**Nursing & Midwifery**

**Rationale and Purpose of the Module:** The aim of this module is to enhance the student students' knowledge and understanding of the causes of hereditary linked disorders

**Syllabus:** Cell biology Prokaryote and eukaryote cells
- Cell divisions; Biological basis of heredity; The clinical significance of Mendelian inheritance in humans. The nature of DNA genes; Genes; Alleles; Chromosomes; Autosomes and sex chromosomes; How genes function, autosomal dominant; Predictions of genetic outcomes; Autosomal recessive inheritance, Autosomal dominant inheritance, X linked recessive inheritance including common disorders, X linked dominant for each; Mitochondrial inheritance including common disorders,, Multifactorial inheritance including disorders; Comparative analysis of single gene conditions;

Chromosomal disorders - autosomal abnormalities, sex chromosomal abnormalities, changes in chromosome structure, changes in chromosome number; karyotyping; Genetics of common mental and disorders; Genetics of common physical disorders, polygenic inheritance; Some basic concepts in population genetics.; Genetic screening; New born screening for genetically inherited conditions including phenylketonuria, maple syrup urine disease, homocystinuria, galactosaemia, cystic fibrosis; Factors influencing teratogenesis; Genes and cancer; Genetic counselling.

**NS4022 - PHARMACOLOGY FOR NURSES AND MIDWIVES**
ECTS Credits: 6

**Nursing & Midwifery**

**Rationale and Purpose of the Module:** The purpose of this module is to provide the student with a knowledge and understanding of the principles of pharmacology with application to the role of the nurse and midwife in safe and effective medication process.

**Syllabus:** Pharmacology: Definitions; drugs, pharmacology, drugs, pharmacodynamics,
- Pharmacokinetics, therapeutics, pharmacodynamics,
- Drug dosage forms and routes of administration. Sources of drugs; Classifications and pharmacological effects (including adverse reactions) of commonly prescribed drugs, psychopharmacology. Sources of drug information. Regulation of drugs. Factors modifying drug response. (including drug interactions). Bioavailability, disposition, antimicrobial susceptibility,. Therapeutic index and dosage of antimicrobial drugs.potential for drug toxicity. Concept of bioequivalence. Controlled - release dosage forms. Therapeutic drug monitoring.


**Clinical Skills:**
- Policy Guidelines and guidelines, (ABA and local) and: Bord Altranais agus Cnáimhseachais na hÉireann and local guidelines and their application to practice
- Medication safety procedures
- Drug calculations
- Administration routines and techniques
- Preparation and care of the patient/client service user receiving intravenous therapy
- Care and management of women with epidural/spinal anaesthesia
- Blood and blood products
- Blood transfusion
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

NS4072 - MIDWIFERY PRACTICE AND NORMAL BIRTH
ECTS Credits: 6
Nursing & Midwifery

Rationale and Purpose of the Module: The module will give students the knowledge and skills to assess, plan and implement midwifery care for women and their families experiencing normal childbirth.

Syllabus: Birthing Environment; Assess, plan and implement midwifery care for women and their families experiencing normal childbirth throughout the intranatal and postnatal period; Physiology and care of women in the 1st, second stage, third stage of labour, care of the pelvic floor in childbirth; The physiology of pain; The role of pain in normal birth; Non-pharmacological methods of pain relief; Principles of drug administration for pain relief in labour including inhalation and epidural analgesia. Physiology and care in the puerperium. Bereavement and loss in childbirth. Communicating and recording clinical practice.

Clinical skills:
Recognition of the onset of normal spontaneous labour
Assessment and care of a woman on admission and throughout labour
Vaginal examination
Introduction to K2 Medical Systems Fetal Monitoring Training Systems
Demonstrates positions for labour and birth
Principles of elimination management; micturition and catheterisation
Demonstrates the normal mechanism of labour
Assisting a woman giving birth
Maintaining a safe environment for normal birth
Management of the third stage of labour
Examination of the placenta and membranes
Assessment and care of a woman and her baby in the postnatal period
Documentation to include partograph

NS4074 - SEXUAL AND REPRODUCTIVE HEALTH IN MIDWIFERY
ECTS Credits: 6
Nursing & Midwifery

Rationale and Purpose of the Module: This module will enable the student to promote gynaecological and reproductive health and well-being and provide care for women with related gynaecological and reproductive problems.

Syllabus: Gynaecological health and well being and care for women with related problems, to include endometriosis, poly cystic ovarian syndrome, cervical cancer screening, breast awareness, gynaecological cancers. Topics addressed will include fertility, infertility and its impact on women's well-being, pre-conception care, sexuality and childbearing, sexual and reproductive health needs of diverse groups eg teenagers, travellers,. Cultural issues which impact on sexuality, fertility and childbearing e.g. female genital mutilation. Health promotion strategies appropriate within maternal health, use of complementary therapies in childbirth, reproduction and childbearing. The role of the midwife in family planning contraception,. Impact of substance abuse on childbearing, sexually transmitted infections, consequences of childbearing childbearing including morbidity and mortality, pregnancy and . Perinatal mental health, domestic violence/abuse. Applied pharmacology.

NS4084 - CARE OF THE AT RISK AND ILL NEONATE
ECTS Credits: 9
Nursing & Midwifery

Rationale and Purpose of the Module: This module will enhance the students role and responsibilities in relation to the care of the at risk and ill neonate.

Syllabus: Systematic care for the at risk and ill neonate e.g. management of cardiovascular and respiratory disorders, neonatal jaundice, metabolic transient disorders, endocrine disorders and congenital anomalies, infections in the neonate, trauma in the neonate, complications arising with low birth weight, preterm and post term infant; breastfeeding management under difficult circumstances, midwifes role within the multidisciplinary team; neonatal resuscitation and rapid midwifery intervention; perinatal and infant morbidity and mortality; adoption and fostering; child protection issues; support in the context of bereavement and loss

CLINICAL SKILLS:
Introduction to the Neonatal Resuscitation Programme Assessment and management of the at risk and ill neonate
Nutritional support for the at risk and ill neonate (feeding practices oral, nasogastric)
Care of baby in an incubator and under phototherapy Administration of medication to the neonate

NS4202 - BIOLOGICAL SCIENCES 2, ANATOMY, PHYSIOLOGY AND EMBRYOLOGY
ECTS Credits: 3
Nursing & Midwifery

Rationale and Purpose of the Module: The aim of this module is to provide students with the foundation for understanding normal human anatomy and physiological functioning and embryology so as to assist in the study of the effects of illness and disease on the individual.

Syllabus: Structure and function of the Circulatory system. Structure and function of the Respiratory system. Structure and function of the Lymphatic system. Innate and adaptive immunity. Contribution of each system to the maintenance of homeostasis. Embryology: pre-embryonic, embryonic and foetal development and
**NS4204 - RESEARCH FOR NURSES AND MIDWIVES**  
ECTS Credits: 3

**Nursing & Midwifery**

**Rationale and Purpose of the Module:** The module aims to develop knowledge, attitudes and skills to critically review research literature, and understand the contribution of research to nursing and midwifery practice.  

**Syllabus:** Ways of knowing in Nursing, Midwifery and healthcare practice. Accessing sources of knowledge: searching, reading, critiquing literature. Philosophical and theoretical underpinning of research: philosophy and research paradigms, Ethical issue. the research process: developing a research concept, statement, design. Introduction to methodologies: qualitative, quantitative, action research. Data collection and analysis, writing up research.

**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.

**NS4212 - COMMUNICATIONS AND THERAPEUTIC RELATIONSHIPS**  
ECTS Credits: 6

**Nursing & Midwifery**

**Rationale and Purpose of the Module:** This module will address the nursing care and management of individuals' endocrine and reproductive disorders and the provision of appropriate nursing care for individuals with such condition(s) in the acute and community setting.

**Syllabus:** Integrate professional values and nursing roles through nursing assessment and management of endocrine disorders: e.g. diabetes, thyrotoxicosis and hypothermia. Nursing assessment and management of reproductive disorders: e.g. benign/malignant breast disorders, dysfunctional uterine bleeding, cervical carcinoma; menopause, sexual health problems: e.g. infertility, endometriosis, and sexually transmitted infections within primary, secondary and tertiary healthcare settings. Nurse’s role and responsibilities in the investigative and diagnostic procedures within the healthcare team. Applied pharmacology. Clinical Skills

**Clinical Skills**

Insulin administration, techniques  
Women's health - breast awareness, cervical screening,  
Men's health - testicular examination

**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.


**NS4222 - RESPIRATORY AND CIRCULATORY NURSING**  
ECTS Credits: 6
Nursing & Midwifery

Rationale and Purpose of the Module: This module will address the nursing care and management of individuals with respiratory, circulatory, blood and lymph disorders. The nurse’s role in the supportive-educative process will be explored in respect of acute or progressive respiratory and circulatory disorders. The aim of this module is to facilitate students understanding of respiratory, circulatory, blood and lymph disorders so that they may provide appropriate nursing of an individual with such condition(s).

Syllabus: Nursing care and management of individuals with respiratory disorders e.g. infection, chronic obstructive pulmonary disorders, asthma, carcinoma, airway obstruction. Nursing care and management of a patient with a tracheotomy/tracheostomy. Nursing care and management of individuals with cardiovascular disorders e.g. hypertension, myocardial infarction, congestive cardiac failure, shock. Nursing care and management of a patient receiving a blood transfusion. Disorders of blood and lymph: anaemia, leukaemia. Nurses role in the collaborative process of care with individuals and the family/carer. Related pharmacology. Nurses role and responsibilities in investigative, diagnostic procedures

Clinical Skills Syllabus:
- Oxygen therapy
- Suctioning techniques
- Nebulisers/inhalers
- Peak flow
- Active and passive limb exercises.
- Tracheostomy management: dressings, removal, cuff inflation/deflation
- Emergency Intra pleural drainage: underwater seal drain.
- Postural drainage
- Intravenous infusions
- Introduction to blood transfusion

NS4224 - NEUROLOGICAL, SENSORY AND MUSCULA-SKELETAL NURSING
ECTS Credits: 6

Nursing & Midwifery

Rationale and Purpose of the Module: The purpose of this module is to facilitate students’ understanding of neurological, sensory and musculo-skeletal disorders and to provide appropriate nursing care to an individual with such condition(s) across all healthcare settings.

Syllabus: Neurological disorders: e.g. head injuries, increased intracranial pressure, cerebral vascular accident, epilepsy, meningitis, multiple sclerosis, Alzheimer’s and Parkinson’s disease; nursing care and management. Nursing care and management of individuals with auditory and visual disorders: Musculo-skeletal disorders: e.g. osteoporosis, fractures, amputation, spinal injuries; arthritis, nursing care and management. Nurses role and responsibilities in investigative and diagnostic procedures. Applied pharmacology.
- Fracture management and care e.g. cast care, traction, external skeletal fixation, limb elevation
- Positioning and mobilising after orthopaedic surgery
- Eye care
- Ear care
- Stroke positioning
- Glasgow coma scale and other neurological assessments

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.

NS4238 - NURSING ASSESSMENT AND DIAGNOSIS
ECTS Credits: 6

Nursing & Midwifery

Rationale and Purpose of the Module: The purpose of this module is to explore and discuss assessment and diagnosis within the nursing process framework and to enhance the student’s existing knowledge of the care planning processes with particular emphasis on person-centred care. Furthermore, the module aims to consider and discuss the most up to date evidence based assessment tools and care planning processes in tandem with current health care policies.


NS4322 - NURSING THE CHILD WITH INTELECTUAL DISABILITY
ECTS Credits: 6

Nursing & Midwifery

Rationale and Purpose of the Module: The module aims to introduce students to the nature and manifestations of conditions associated with intellectual disability. A person centred approach which places children and their families at the centre of care is espoused at all times

Syllabus: Peri and post natal development; screening tests at birth and premature reflexes. Intellectual disabilities: incidence, causation, manifestations nursing care and management of a child presenting with an intellectual disability e.g. Down syndrome, cerebral palsy, autism, genetic conditions, hydrocephalus. Complex and continuing health care needs e.g. epilepsy, contractures and restriction in movement. Communication and language needs of the child. Play and music as a developmental process and therapeutic activity. The function and role of movement and physical
fitness in the acquisition of social skill and self-help
development. Education and integration into mainstream
facilities. Concept of child protection; recognition and
consequence of child abuse, procedures and guidelines
for reporting abuse. Applied pharmacology

Clinical Skills Syllabus:
Assist babies/children at mealtimes and bathing
Use and care of nebulisers, peak flow measurement,
inhalers/chambers, oxygen therapy, and suctioning
technique
Principles in performing active and passive limb exercises
Assess levels of consciousness
Basic instrumental/music skills

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**NS4324 - NURSING THE INDIVIDUAL WITH
MULTIPLE NEEDS**

 Despite Credits: 6

**Nursing & Midwifery**

**Rationale and Purpose of the Module:** The aim of this
module is to introduce the student to the care and
management of persons with an intellectual disability
associated with physical and sensory impairment.

**Syllabus:** The nursing care and management of acute
and chronic physical illness. Senses and their functions
and sensory impairment: care and management.
Physical disability, nursing care and management.
Preparation and care of persons with an intellectual
disability undergoing investigative and diagnostic
procedures. Functions and promotion of sleep. Applied
pharmacology

Clinical Skills Syllabus:
Breast awareness
Testicular examination
Cervical screening
Monitoring of blood glucose and administration of insulin
Wound management and associated dressing techniques

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**NS4422 - MOOD AND EMOTIONAL DISORDERS AND
MENTAL HEALTH NURSING**

 Despite Credits: 6

**Nursing & Midwifery**

**Rationale and Purpose of the Module:** The purpose of
this module is to introduce the student to common
anxiety and mood related disorders and the consequent
impact of these disorders on individuals’ biopsychosocial
well-being and functioning. The role of the nurse in
delivering evidenced based interventions that facilitate
recovery of persons experiencing mood and anxiety
related disorders. Across primary, secondary and tertiary
healthcare settings will be discussed.

**Syllabus:** Disorders related to anxiety and mood
disturbance. Aetiology of mood and anxiety disorders.
Pre-disposing, precipitating, perpetuating and protective
factors associated with mood and anxiety, disorders,
Characteristic features and biopsychosocial effects of
anxiety and mood disorders. Comprehensive, person-
centered, biopsychosocial, mental state and risk
assessment of persons experiencing anxiety and mood
disorders. Care planning and evidenced-based
interventions including pharmacological and non-
pharmacological approaches that promote recovery for
persons experiencing mood and anxiety disorders
Strategies to evaluate interventions. Introduction to
cognitive and behavioural therapies. Application of
cognitive behavioural therapy in the management of
anxiety and mood disorders. Role of the nurse in somatic
therapies e.g. electro-convulsive therapy.

Clinical Skills:
Communication and therapeutic relationship skill
development to work with persons with mood and
emotional disorders
Interview and assessment skills
Care plan documentation
Skills in Cognitive Behavioural Interventions for anxiety
and mood disorders e.g. anxiety management
techniques, relaxation training, activity scheduling.
Peri-operative care in relation to ECT.
Suctioning technique positioning of service user

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**NS4424 - NURSING THE OLDER PERSON WITH
INTELLECTUAL DISABIL**

 Despite Credits: 6

**Nursing & Midwifery**

**Rationale and Purpose of the Module:** To module
aims to develop students knowledge regarding the ageing
process and the specific needs of older persons with an
intellectual disability.

**Syllabus:** Ageism, concepts and theories of ageing,
physiological social and psychological changes associated
with generic ageing and the older person with an
intellectual disability. Nursing care and management of
support for the older person with an intellectual
disability. Person centred planning and the concept of
choice and quality of life in older adulthood. Nursing
process applied to the older person with an intellectual
disability associated with age related illness. Living
arrangements and service provision for the older person
with an intellectual disability. The following concepts
related to the older person with an intellectual disability;
retirement, recreational and leisure pursuits, spiritual
care, pastoral care and palliative care. Applied
pharmacology.

Clinical Skills Syllabus:
Central Nervous System (CNS) examination
Facilitative communication skills: reality orientation,
reminiscence and art therapy
Assisting an older person with mobility and engagement
in activities of living
Environmental comfort and last offices

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**NS4434 - PSYCHOTIC AND PERSONALITY
DISORDERS AND MENTAL HLTH**

 Despite Credits: 6

**Nursing & Midwifery**

**Rationale and Purpose of the Module:** The purpose of
this module is to develop the students' knowledge and
understanding of the role of the nurse in the care and
management of an individual experiencing personality or
psychotic disorders

**Syllabus:** Disorders of thought and perception; e.g.
schizophrenia, presentation, aetiology, types,
classifications, epidemiology, and socio-cultural aspects.
Personality disorders; theories, classifications,
characteristics. Nursing assessment and management of
persons with a schizophrenia and personality disorder.
The role of the nurse in providing effective therapeutic
interventions which facilitate recovery and well-being in
persons with schizophrenia or personality disorders
and their families/carers. Related pharmacology.
Contemporary research findings and relevant health
policy.

Clinical Skills Syllabus:
Engagement and facilitation when communicating with
persons with psychotic and personality disorders.
Observation, recording and eliciting information in the
assessment of persons with psychotic disorders
Introduction to cognitive behaviour therapy for
schizophrenia and dialectic behaviour therapy for persons with personality disorders

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NS4444 - PSYCHOTHERAPEUTIC ENGAGEMENT IN MENTAL HEALTH
ECTS Credits: 6

Nursing & Midwifery

Rationale and Purpose of the Module: The aim of this module is to build upon the skills of communication learned in year one of the programme. The student will develop their knowledge and application of counselling skills applicable to mental health/psychiatric nursing clinical practice.

Syllabus: Therapeutic relationship in mental health nursing; Introduction to models and theories of counselling and nursing interpersonal theory. Exploration and application of the core concepts of therapeutic engagement in/to nursing practice (trust, empathy, congruence, unconditional positive regard, hope). The use of ‘self’ as therapeutic tool, equality, self-determination dignity and recovery within the relationship. The counselling process in nursing practice, application of counselling skill in one to one and group settings (organisation, facilitation, interpersonal conflict, disclosure). Crisis intervention; modalities, types, nursing care and management. Support systems, peer support, clinical supervision reflection. Contemporary research findings and relevant health policy.

Clinical Skills:
Facilitation of group therapy
Counselling skills and processes
Crisis intervention strategies
Central Nervous System (CNS) examination
Active and passive limb exercises
Assisting with mobility

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PA4011 - THE CIVIL AND PUBLIC SERVICE
ECTS Credits: 6

Politics and Public Admin

Rationale and Purpose of the Module: To identify, analyse and explore the role and functions of the civil service within the context of the overall politico-administrative system in Ireland.

Syllabus: Key features of the modern democratic state; the Irish state at independence; growth of the public sector; the constitutional and legal position of the public service; the structure of the public service; the civil service; government departments; ministerial responsibility and ministerial resources; the higher civil service and the policy process; coordination and control of the policy process; civil service reform and modernisation.

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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

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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

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PA4018 - THE PUBLIC POLICY PROCESS
ECTS Credits: 6

Politics and Public Admin

Rationale and Purpose of the Module: Aims: This course aims to provide students with an overview of the theory and practice of policy analysis. The process of public policy making in the modern democratic state will be explored with particular reference to the socio-political environment of policy making and organisationally based decision processes within public administration.

Objectives:
- To build an understanding of what policy is, nature of policy problems and the role of problem definition in structuring policy
- To focus on theories of the public policy process and explore the variety and complexity of decision making processes
- To identify a classification of approaches to the analysis of public policy
- To evaluate and understand how information about public policies is made available and is accountability for outcomes clear
- To evaluate the policy process in government and public bureaucracies through the analysis of case study material
- To promote career development skills

Syllabus: What is public policy?; stages approach to the policy process; rational approaches - elitism, pluralism, corporatism; agenda setting; models of decision making - Simon, Lindblom, Allison, Etzioni, Dror; institutional approaches; rational choice theory; policy networks; policy transfer; policy implementation; evaluation,
PD4004 - DESIGN VISUALISATION
ECTS Credits: 6

Rationale and Purpose of the Module: The aim of this module is to build upon the learning outcomes from ID4811/2 in first year where students learn to represent their design ideas graphically through the traditional media of pens, pencils markers etc. This module will develop skills of product representation using design CAD software (Adobe Creative Suite). The students will be able to:

- Understand the needs and practices of presentation in design
- Project the meanings behind the concepts through visual methods
- Graphically represent concepts using the Adobe Illustrator as a drafting tool.
- Undertake visualisations of products that are photorealistic representations in 2D using Adobe Photoshop graphic software tool.
- Undertake Product/systems presentations using Adobe InDesign graphic design tool.
- Photography and digital editing.
- Contextualisation of products (graphically place in-situ).

PD4018 - DESIGN PROJECT 2
ECTS Credits: 18

Design and Manufacturing Technology

Rationale and Purpose of the Module: Semester 8 will see the realisation and execution of the final design project. The individual designs will be brought to a high level of development, detailing and presentation.

- To develop design skills to a professional level, including sketching, visual communication, model-making.
- To explore and refine design detailing through thorough user testing.
- Use detailed functioning prototypes to assess the viability of design ideas during the design process.
- To develop design ideas to a high level of manufacturing and material specification as well fully detailing product functionality and interface features.
- To bring design concepts to a professional standard of aesthetic refinement.

PD4102 - DESIGN STUDIO 2
ECTS Credits: 6

Design and Manufacturing Technology

Rationale and Purpose of the Module: To develop the basic skills in and cognitive processes of product design and to continue to build from PD4101 to lay the foundations for the subsequent Design Studio modules. These will be taught under the following headings: Design Methods, Design Techniques and Design History.

Syllabus: This module comprises three complimentary streams, Design Methods, Design Techniques and Design History. These combine to introduce the student to the designed product in total taking into account practical considerations, aesthetics and social conditions.

Design Methods:
To develop an approach to design - Working to a brief -
following a design process - Working to a time schedule - Stimulating the imagination through design projects - an introduction to conceptual 2D and 3D design skills - basic problem solving- basic creative thinking techniques - an introduction to the relationship between design and manufacture - An introduction to user research and user understanding and simple ergonomics - The development of high fidelity prototyping and sketch-model making skills - The development of the manual and cognitive skills of idea development and communication

Design Techniques:
The development of drawing, illustration and rendering skills - perspective, form building and orthographic technical drawing - the practical development of the manual and mental skills of idea development and communication - Both formal and informal techniques - Emphasis on fluidity and speed - The of 2D and 3D shape and form understanding through the use of tone and colour using rendering media including felt-tipped pens, pencils, pastels, gouache and markers - fundamentals of professional presentation techniques and graphic layout.

Design History:
An overview of industrial design in the context of social and economic conditions (from the Industrial Revolution to Contemporary Design). Discussion of the evolution of design styles and practices and how design style and economic conditions evolve. (from the Industrial Revolution to Contemporary Design). Discussion of the evolution of design styles and practices and how design style and economic conditions evolve.

Syllabus: The following is an outline of topics covered in project based studio classes:
Evaluation and filtering methods for concept selection.
Idea generation techniques.
Implementation of entire design process from research to design detailing.
Design ideation.
Engagement with industry partners through sponsored design projects.
Visual communication tools.
Advanced design skills development.
Usability principles - testing and analysis.
Graphical user interface interaction.
Product design focused manufacturing techniques and materials.

PD4124 - CONTEMPORARY DESIGN CULTURE
ECTS Credits: 6

Design and Manufacturing Technology

Rationale and Purpose of the Module:
To effectively experiment, analyse, innovate and plan a design project from inception to completion.
Understand and develop design ideation.
Implement a variety of design tools and methodologies.
Engage in multidisciplinary teams.
Collaborate with industry partners.
Improve teamwork skills.
Improve primary design research skills.
Collate, analyse and synthesise research findings for design ideation.
In-depth user testing and analysis.
Improve concept development skills through exploration of idea generation techniques.
Develop an ability to effectively progress concepts through iteration.
Critique and evaluate concepts.
Develop an appreciation for design detailing.
Develop knowledge of design manufacturing processes and materials.
Advance design communication skills.
Utilise leading edge technologies in communication of designs.
Develop an ability to reflect on personal design work.
Application of this theory to their own work through project based studio classes.

Syllabus: Contemporary design approaches.

PD4112 - PRODUCTION TECHNOLOGY 1
ECTS Credits: 6

Design and Manufacturing Technology

Rationale and Purpose of the Module:
To provide the student with a basic knowledge and experience of the methods employed in the processing and fabrication of common engineering materials.
To develop the students' communication, visualisation and draughting capabilities.
To emphasise the importance of safety in the engineering environment.

Basic machining, cutting tool geometry and materials.
Cutting speeds and feed rates. Fundamental treatment of the shear plane Workholding, positive and frictional restraint, degrees of freedom.
Joining - mechanical, manual metal arc welding, oxy-acetylene welding, adhesive bonding.
Joint design.
Engineering drawing - communication and visualisation.
Technical sketching. Conventional representation; BS308.
Projection systems. Auxiliary views. Sections and sectional views, dimensioning. Detail and assembly drawings, surface intersections and developments.
Limits and fits. BS4500.

PH4008 - HYDROCARBON FUELS
ECTS Credits: 6

Physics and Energy

Fundamentals of coal, oil and natural gas and their conversion to useful energy products.
Hydrocarbon resource terminology - proven reserves, indicated reserves inferred reserves.
Coal formation, reserves. Coal extraction and production.
Use of coal, combustion, gasification and use in blast furnaces, coke formation. Coal composition, properties, analysis and classification - ranking of coal from sub-bituminous to anthracite. Coal combustion, liquefaction and gasification.
Electricity production from coal combustion. Clean coal technology - gasification with combined cycle.
Origins and geology of oil and gas. Oil and gas reserves.
Non conventional sources of petroleum - oil shale, tar sands and heavy oil deposits. Liquid petroleum fuel and its classification, distillate, non distillate fuels etc. Oil refining and products. Petroleum hydrocarbon structures,
the refining process - distillation (fractionation), reforming, alkylation, polymerisation, hydrotreating and sulphur plants. Oil from coal and gas. Oil and gas engines, spark ignition engine, compression ignition engine and sterling engine.

PH4012 - PHYSICS FOR ENGINEERS 2
ECTS Credits: 6

Physics and Energy
Rationale and Purpose of the Module: Continuation of an introductory course in physics (PH4011) for engineering students.

Syllabus:
- Properties of Matter: Elastic and thermal properties of solids: stress and strain, thermal expansion, Hook's law, Young's modulus, shear modulus, bulk modulus. Fluid mechanics: pressure, variation of pressure with depth, pressure measurements.
- Buoyant forces and Archimedes' principle.
- Fluid dynamics: Bernoulli's equation, other applications of fluid dynamics.
- Light: EM Spectrum, Sources of light; Geometrical optics, reflection, refraction, dispersion, achromatic optics; Physical optics, interference; diffraction; diffraction gratings; polarisation; Optical systems, the microscope, the telescope, the eye.

Prerequisites: PH4011

PH4018 - MEDICAL INSTRUMENTATION
ECTS Credits: 6

Galen and Harvey on the circulatory system.

PH402 - PHYSICS FOR ENVIRONMENTAL AND BIOSCIENCES
ECTS Credits: 6

Physics and Energy
Rationale and Purpose of the Module: To provide an understanding of the basic principles of mechanics, heat, fluids, waves, optics, sound, the atom and nucleus, and how these are relevant to our daily life.

PH4022 - PHYSICS FOR GENERAL SCIENCE 2
ECTS Credits: 6

Physics and Energy
Rationale and Purpose of the Module: To introduce the student to general wave motion, optics and acoustics. To introduce the student to the mechanical and thermal properties of matter.

Syllabus:
- Review of the basic concepts of force and energy. Oscillations and simple harmonic motion: transverse and longitudinal waves, superposition, speed, reflection, harmonic waves, sound waves, sound intensity, Doppler effect.
- Optical systems: the microscope, the telescope, the eye.
Rationale and Purpose of the Module: The purpose of this module is to enhance students' understanding of key concepts and models associated with thermal physics. The objectives are to first present a general thermodynamics framework, then to introduce statistical concepts followed by analysis of specific physical models.

Syllabus: Temperature: thermal equilibrium; the zeroth law; equations of state; temperature scales. [First law of thermodynamics]: internal energy; heat and heat capacity; reversible processes and work; free expansion and Joule's law. [Second law of thermodynamics]: Carnot cycles, efficiency; thermodynamic temperature scale. [Entropy]: Clausius inequality and entropy; principle of increasing entropy; central equation of thermodynamics; entropy of an ideal gas. [Thermodynamic potentials and Maxwell relations]: internal energy U; enthalpy H; Helmholtz free energy F; Gibbs free energy G; energy equations; availability A and useful work; mechanical, magnetic & electrostatic systems. [Change of phase]: chemical potential; Clausius-Clapeyron equation; nucleation; Gibbs phase rule. [Microstates and macrostates]: statistical weight of a macrostate; Boltzmann definition of entropy; entropy and disorder. [Equilibrium of an isolated system]: magnetic dipole lattice; Schottky defects. [Equilibrium of a system in a heat bath]: the partition function and the Boltzmann distribution; equivalence of thermodynamic and statistical quantities; the classical gas; heat capacities of solids; perfect quantal gas; Planck's law; thermodynamics of black body radiation. [Equilibrium of a system with variable particle number]: Gibbs distribution; Fermi-Dirac and Bose-Einstein distributions; Bose-Einstein condensation; Fermi energy; density of states; electrons in metals.

Prerequisites: PH4131

PH4038 - ENERGY STORAGE
ECTS Credits: 6
Physics and Energy

Fundamentals of advanced energy conversion and storage.


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PH4042 - THERMAL PHYSICS
ECTS Credits: 6
Physics and Energy

Rationale and Purpose of the Module: The purpose of this module is to enhance students' understanding of elasticity: Hookes law, fluids. Heat: temperature, laws of thermodynamics, heat capacities. Heat transfer: conduction, convection and radiation. Kinetic theory, the ideal gas. Heat engines.

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PH4072 - ELECTROMAGNETISM
ECTS Credits: 6
Physics and Energy

Rationale and Purpose of the Module: The purpose of this module is to enhance students' understanding of key concepts associated with electromagnetism. The objectives are to first present a general vector analysis, then to introduce electric and magnetic field concepts followed by analysis of specific physical problems using vector calculus. Secondly, the students will be introduced to the fundamental properties of electric and magnetic materials. The final objective is to introduce the students to the unified theory of electromagnetic waves and its application in matters and simple physical systems.

Syllabus: Vector methods: div, grad, curl; line, surface and volume integrals; Electric field E: electric charge, Coulomb's law, electric field E, Gauss's law, divergence of electric field, the Dirac delta function; Magnetic field: magnetic field B, Biot-Savart law, Ampere's law, Lorentz force; Electromagnetic induction: emf, Faraday's law, generators and motors; Maxwell's equations in vacuum: integral and differential form, monopoles; Energy and
potential: energy density in E and B fields, scalar potential V and vector potential A; Dipoles and multipoles: electric dipole p, magnetic dipole m, electric multipoles; Conductors: conductivity, Ohm’s law, Hall effect; Dielectrics: polarisation P, displacement D, permittivity, electric susceptibility, dielectric constant; Magnetic materials: diamagnets, paramagnets, ferromagnets; magnetic intensity H, magnetisation M, magnetic susceptibility, inductance, transformers; Maxwell’s equations in matter: Maxwell’s equations in terms of H and D; Boundary value problems: Poisson’s equation, Laplace’s equation, uniqueness theorem, images; Circuits: transients, reactance, power, and impedance.

Prerequisites: PH4131

PH4092 - SEMICONDUCTOR DEVICES
ECTS Credits: 6

Physics and Energy

Rationale and Purpose of the Module: To introduce the student to the physics of solid state electronic devices and to their application

Syllabus: Conduction in solids: elementary band theory of conductors, semiconductors and insulators, doping; donor and acceptor impurities, intrinsic and extrinsic conduction, majority and minority charge carriers. The PN junction: junction diode and applications, Zener diode, the bipolar transistor; transistor action, applications of the emitter amplifier, early effect; the field effect transistor, JFET, MOSFET, characteristics and application simple circuits. Combinational Logic: Binary Logic, Logic functions; AND, OR, NOT; Truth table; Boolean Algebra; Boole Boolean postulates and theorems, De Morgan; Logic gates - complete set; NAND and NOR implementations of logic functions; Multiple-input gates. Sequential Logic: Memory, feedback, synchronous/asynchronous, Flip-flops, Latches; basic SR latch, gated SR Latch, D-type, Master-slave latch, JK Latch; Shift Registers, Counters, UART (block diagram). Operational and Instrumentation amplifiers: desirable characteristics, comparators, voltage reference, virtual earth, voltage follower, Nyquist/Shannon sampling theorem.

Prerequisites: PH4131

PH4102 - WAVES/LIGHT/MODERN PHYSICS
ECTS Credits: 6

Physics and Energy

Rationale and Purpose of the Module: To introduce the student to general wave motion, optics and acoustics and to provide the student with a general introduction to special relativity and to atomic and nuclear physics.

Syllabus: Oscillations and simple harmonic motion: transverse and longitudinal waves, superposition, speed, reflection, harmonic waves. Sound: sound waves, sound intensity, Doppler effect. Light: EM Spectrum, Sources of light, Geometrical optics; reflection, refraction, dispersion, achromatic optics; Physical optics; interference, diffraction, diffraction gratings, polarisation; Optical systems: the microscope, the telescope, the eye. Special Relativity: Einstein's Postulates, time dilation, length contraction, the Lorentz Transformation, relativistic momentum and energy conservation. Atom: Classical models, Planck's quantum hypothesis, the Bohr atom, The photoelectric effect; quantized energy; the de Broglie wavelength. The nucleus: nucleons; isotopes; nuclear structure; binding energy. Radiation: X rays, alfa, beta and gamma radiation, the law of radioactive decay. fission and fusion; nuclear reactors. Detection, dosage.

Prerequisites: PH4131

PH4111 - SEMICONDUCTORS 2
ECTS Credits: 6

Physics and Energy

Rationale and Purpose of the Module: The purpose of the module is introduce advanced CMOS process technology and the problems associated with device fabrication as the technology moves towards 30 nm features and below.


Prerequisites: PH4071, PH4805

PH4132 - MODERN PHYSICS
ECTS Credits: 6

Physics and Energy

Rationale and Purpose of the Module: This module will develop the student’s understanding of fundamental concepts and ideas in modern physics, specifically the use and application of the Schroedinger equation, and the principles of special relativity.

Syllabus: Wave mechanics: De Broglie's hypothesis, wave functions and probability amplitudes, the Heisenberg Uncertainty principle. The Schroedinger wave equation: simple solutions in one dimension, transmission, reflection and penetration at a barrier, tunnelling, potential wells, the harmonic oscillator. The Schrödinger equation in three dimensions: the hydrogen atom, quantisation of angular momentum, spatial quantisation, the Zeeman effect. Spin: the fourth quantum number, the Pauli exclusion principle. Special Relativity: Relativistic dynamics, relativistic mass and momentum, total energy, mass/energy equivalence. Spacetime: spacetime diagrams, introduction to four-vectors. Application of relativistic
dynamics to particle beam devices and collision experiments.
Nuclear Physics: Nucleons and nuclear models, nuclear spin, nuclear reactions and cross-sections. Introduction to elementary particles and the Standard Model.

Prerequisites: PH4102

PH4608 - SOLID STATE PHYSICS 2
ECTS Credits: 6

Physics and Energy

Rationale and Purpose of the Module: The purpose of this module is to enhance the students understanding of key concepts in solid state physics, magnetism, superconductivity and low dimensional systems.

Syllabus:
- Magnetism: paramagnetism, diamagnetism, exchange interaction and ferromagnetism, Weiss model of ferromagnetism, Neel model of antiferromagnetism, domains and Bloch walls, giant magnetoresistance.
- Insulators: dielectrics and susceptibility, pyroelectrics, ferroelectrics and piezoelectrics. Quantum transport:
  - ballistic transport, tunnelling and Coulomb blockade. Low dimensional systems: two dimensional electron/phonon gas, density of states, quantum Hall effect.
- Superconductivity: Type-1 and Type-2 superconductors, magnetic properties, thermodynamics of superconducting transition, London equations, energy gap and Cooper pairs, tunnel junctions and Josephson effect.

Prerequisites: PH4607

PI4024 - PHILOSOPHY AND ETHICS IN HEALTH STUDIES
ECTS Credits: 3

Nursing & Midwifery

Rationale and Purpose of the Module: The module does to introduce students to standard philosophical and ethical approaches that guide nursing and midwifery practice.

Syllabus:
- Contemporary philosophical theories enlightening underpinning nursing and midwifery practice with particular reference to developments in such schools as existentialism; phenomenology; philosophy as therapy; understanding the body, the person (holism vs. dualism), relationships and desire; critical thinking and ethical decision-making. Theoretical approaches to ethics: deontological, utilitarian, and rights-based views. The role of oaths, declarations and codes in medical ethics. Key principles: patient of Nursing and Midwifery ethics including, autonomy, advocacy, beneficence and primum non nocere, truth-telling, confidentiality and justice; traditional distinctions for example, between acts and omissions and ordinary and extraordinary means; the double-effect criterion; selected issues etc.

Prerequisites: PH4102

PM4008 - EMPLOYMENT RELATIONS PRACTICE
ECTS Credits: 6

Personnel & Employment Relations

Rationale and Purpose of the Module: The module is designed to provide students with a conceptual appreciation and practical understanding of Human Resource Development in organisations. There is a strong focus on integrating HRD activities with the range of HR policies and systems enacted by organisations and on perceiving HRD as a strategic organisational activity.

Syllabus: This module is designed to provide students with a conceptual appreciation and practical understanding of Human Resource Development (HRD) in organisations. There is a strong focus on integrating HRD activities with the range of HR policies and systems enacted by organisations and on perceiving HRD as a strategic organisational activity. The lectures are designed to provide students with a framework for evaluating the contribution that HRD can make to organisational functioning and for reflecting on the role that the HR practitioner plays in this scenario.

Prerequisites: PM4013

PM4022 - PRINCIPLES OF ORGANISATIONAL BEHAVIOUR
ECTS Credits: 6

Personnel & Employment Relations

Rationale and Purpose of the Module: This module is designed to give students an understanding of key concepts in Organisational Behaviour. It seeks to describe the complex work organisation from a behavioural perspective and it evaluates the methodologies available for analysing organisational behaviour. In an attempt to provide some answers to the cwyh of human behaviour in the workplace, selected individual, group and organisational processes are introduced and explored.

Syllabus: Organisational Behaviour in perspective: Introduction to the field and paradigms of study; Defining the concept; disciplinarily and interdisciplinary nature of the field; dominant methodologies for study.
understanding the social world. Personality: Defining personality; sources of personality difference; the nature/nurture debate. Perception and Cognition: The nature of perception; perception and perceptual influences; the process of perception. Motivation; theories of motivation: Learning & the Individual: Defining learning and theories of learning. Stress & Psychological Well being: stress at work; stress and performances; psychological well-being and self esteem. Groups & Team Roles: What is a group in psychological terms; function of groups; Hawthorne studies; the group formation process. Power, Politics and Ethics: Interrelated concepts; sources of power; the use of power; political tactics and their use and legitimacy in organisational life. Leadership: theories of leadership; Organisational culture; diagnosing organisational culture; Schein's typology; formation and maintenance

PM4028 - PSYCHOMETRICS AND PSYCHOLOGICAL TESTING
ECTS Credits: 6

Personnel & Employment Relations

Rationale and Purpose of the Module: The aims and objectives of this module are as follows:
To develop a working knowledge of assessments used in the selection of employees, including ability, aptitude and personality tests.
To develop an appreciation for the appropriateness of using psychometric testing in selection and assessment of employees.
To develop skills of analysing, critiquing, interpreting and designing assessments.

Syllabus:
1 Introduction: What are psychometrics and psychological testing?
2 Contextualising psychometrics - The role of psychometrics in the selection process.
3 An introduction to job analysis, and its role in selecting tests.
4 Intelligence and cognitive ability - definitions and theories.
5 Measuring intelligence and cognitive ability.
6 Personality - definitions and theories.
7 Considerations in choosing a selection method: Sensitivity, validity and bias in measurement; Ethical and Professional Issues in Testing.
8 Administering tests.
9 Interpreting tests and giving feedback.
10 Psychometrics and job performance.
11 Some recent advances: attitudes, and motivational approaches; Computer-based testing.
12 Relating psychometrics to other scientific methods of selection: interviews, and assessment centres.

PM4044 - EMPLOYMENT RELATIONS: THEORY AND DEVELOPMENTS
ECTS Credits: 6

Personnel & Employment Relations

Rationale and Purpose of the Module: To outline the role of the State, Trade Unions and Employers in industrial relations. To enable students to understand the various theoretical perspectives on employee relations and develop the ability to think critically about the subject. This module will demonstrate to students that conceptual analysis has practical outcomes and consequences. It will also show the historical and economic context in which these perspectives arise and how they are made operational. Students will be able to evaluate the practical consequences of such approaches and the demands they may place on management.

Syllabus:

PM4054 - APPLIED ORGANISATIONAL BEHAVIOUR
ECTS Credits: 6

Personnel & Employment Relations

Rationale and Purpose of the Module: The purpose of this module is to enhance students understanding of key concepts and issues associated with behaviour in organisations. The specific objectives are to focus on the role of individual behaviour; specifically on personality, perception and motivation, and to increase students understanding of group dynamics in the international workplace, paying particular attention to the dynamics of communication, groups, conflict, and leadership. Participants will become acquainted with theories, concepts and methods through both didactic and experiential learning techniques.

Syllabus:
The syllabus allows for the treatment of a small number of critical dimensions of organisational behaviour. Building on material covered in an earlier organisational behaviour module, the module explores a number of processes and issues associated with individual and group behaviour in organisations. It explores the following areas: the development of the individual: personality and individual difference, perception, attitudes, the psychological contract and individual motivation. Group development: structures and roles, the dynamics of groups and teams, communication processes particularly in an intercultural context. organisational leadership and organisational citizenship behaviour are also examined.

PM4078 - HUMAN RESOURCE MANAGEMENT: CONTEXT AND STRATEGY
ECTS Credits: 6

Personnel & Employment Relations

Rationale and Purpose of the Module: One of the core aims of this module is the development of students analytical and conceptual ability in the domain of HRM. The purpose of the module is to integrate knowledge and competence from other previous HR modules and from work experience and to integrate them in a way that requires students to be able to analyse key HR issues in the wider national and international context. Students will be required to critically evaluate key contemporary issues in Human Resource Management literature and to examine trends and developments in HRM/employment relations in the international and Irish context. There will be a focus on more strategic aspects of HRM.

Syllabus:
Introduction to course; Introduction to key concepts; Work routines; Work systems and changing priorities of production; The changing context of work; Contemporary influences on HRM; Strategy and strategic HRM; Models of strategic HRM; HRM and industry dynamics; Changing labour markets; segmentation; internal and external labour markets; flexibility and labour markets; organisational flexibility and HRM; International HRM; annual Lovett lecture; diversity; strategic HR planning; strategic rewards; performance management; live case study from Irish or international context.
To give the students an opportunity to apply some of the skills studied in PN4111 during the previous semester to simple design and make projects. To develop the knowledge, skills, values and attitudes appropriate to the teaching of technologies.


Prerequisites: PN4101

PN4106 - DESIGN AND AUTOMATION
ECTS Credits: 6

Design and Manufacturing Technology

Rationale and Purpose of the Module: To introduce some principles of automation, machine interfacing and robotic control. To further develop the students’ design and problem solving in the context of simple automated systems.


Prerequisites: PN4015

PN4108 - MANUFACTURING AND SERVICE SYSTEMS DESIGN
ECTS Credits: 3

Design and Manufacturing Technology

Rationale and Purpose of the Module: To develop the student’s concept of a production system within a contemporary international context, in terms of its complexity and intellectual challenge.

physical work and knowledge work, design of work-centres, functions of machines and operators, fitting the machine to the operator, task analysis and performance prediction, error prediction, standardisation, simplification and minimal work-flow, implications of good and bad design.

7. Designing the facility: process analysis, layout of facilities, space allowances, adjacency desirability, minimal distance, WIP, capacity determination and bottlenecks, safety, hazardous processes and storage, security. Implications of good and bad design.

8. Combining enterprises into supply-chains: supply-make-deliver, location decisions, transportation alternatives, site selection, why companies choose one country over another. Placing inventory - dynamic phenomena in supply-chain control - the beer game. Implications of good and bad design.

9. Operationalising ¿soft¿ systems improvement - PDCA cycle (plan-do-check-act), motivation and human-centred operations improvement, quality circles, ASRS reporting systems in air transportation, six-sigma, lean, future ¿soft¿ technologies?

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PN4206 - PROCESS TECHNOLOGY 4 (ED)
ECTS Credits: 6
Design and Manufacturing Technology

Rationale and Purpose of the Module: To introduce further essential material and so provide the student with a balanced experience in the study of material processing techniques. To further develop the students analytical abilities in the area of machine design. To apply the knowledge and skills acquired in previous modules to a substantial design and make project


Prerequisites: PN4015, PN4105

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PN4306 - DESIGN & COMMUNICATION GRAPHICS 2
ECTS Credits: 6
Design and Manufacturing Technology

Rationale and Purpose of the Module: To extend the students applied graphical problem-solving skills and broaden their body of design and communication graphics knowledge. To equip students for the challenges of teaching design and communication graphics topics in final year teaching practice. To further develop the students¿ capabilities and competencies in the use of advanced parametric modelling tools to create increasingly complex product geometries. To introduce students to the pedagogical applications of 3D CAD in developing teaching resources for design and communication graphics and in solving design problems. To develop the students¿ knowledge of 3D CAD pedagogy.


Assembly analysis. Surface and hybrid modelling techniques. Sheet metal, weldment, mould and die tools. Animation and simulation analysis of 3D CAD assemblies. 3D CAD pedagogy.

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PN4308 - DESIGN & COMMUNICATION GRAPHICS 3
ECTS Credits: 6
Design and Manufacturing Technology

Rationale and Purpose of the Module: To provide students with the advanced applied graphics knowledge and skills required to teach design and communication graphics. To further develop students¿ knowledge and understanding of advanced plane and descriptive geometry problems. Use 3D CAD to develop teaching resources for Design and Communication Graphics. To apply 3D CAD to solve applied graphics and descriptive geometry problems. To extend the students¿ body of knowledge associated with design and communication graphics and its applications.


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PN4318 - MACHINE CONTROL
ECTS Credits: 6
Design and Manufacturing Technology

Rationale and Purpose of the Module: To introduce the student to open and closed loop control systems.
PO4004 - GLOBAL POLITICAL ECONOMY
ECTS Credits: 6
Politics and Public Admin

Rationale and Purpose of the Module: This module aims to familiarise the student with the basic principles and issues in Global Political Economy (GPE). These include the theories associated with GPE and the institutions that manage it. The module, through the assignments and the tutorials, will also develop writing and oral presentation skills.

Syllabus: This module is divided into two sections. The first will deal with the theories used to explain the GPE (mercantilism, liberalism and critical theory) and how they interact and contribute towards the changing nature of global politics. The second will look at the institutional and governmental workings of the global economic, and discuss the context and impacts such governance has had. By the end of the course students should be able to grasp the linkages between politics and economics at the global level and be able to critically evaluate key concepts such as globalisation, the relationship between states and markets, the emergence of multinational economic actors and the role and purpose of institutions such as the World Bank, International Monetary Fund and World Trade Organisation.

PO4008 - AFRICAN POLITICS: DEVELOPMENT AND DEMOCRACY
ECTS Credits: 6
Politics and Public Admin

Rationale and Purpose of the Module: This module will supply an introduction to major political trends in contemporary Africa. Against a brief historical review of African state institutions since the advent of colonialism, the course will explore successive efforts to modernise predominantly peasant economies, using Tanzanian experience as a case study. The factors that many critics believe have helped to contribute to the persistence and accentuation of African poverty will be assessed: these include poor macro economic management, weak institutions, and disadvantageous patterns of historically entrenched primary commodity production.

Syllabus: Modern African State Formation: regional contrasts; Development from the 1930s (with a Tanzanian case study); African poverty: the bottom billion; Urbanisation and urban politics: Lagos; Structural adjustment and market reform (Zambian case study); Democratisation in the 1990s (Ghanaian case study); Democraticisation in the 1990s (South Africa); The developmental consequences of democratisation; War and peace in Africa: Sierra Leone; The politics of the belly; the patrimonial politics in Central Africa; New social movements.

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

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 election 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.
understanding of the history, institutions, decision-making processes and major policies of the European Union. Second, to equip students with an appreciation of the principal issues and controversies which currently face the European Union.

**Syllabus:** The course is divided into two main parts: The first part looks at the EU Institutions and introduces the basic theories of European integration. The second part concentrates on policies and current EU issues.

**Prerequisites:** PO4011

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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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**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

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**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 polity 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
- 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
- The theory of economic reform and post-Soviet politics
- The post-Soviet struggle for power, 1992-1993
- The presidency under Yeltsin
- Yeltsin, oligarchy and the corruption of the state
- The Putin programme: reform or retrenchment?
- The political economy of the new Russia
- Russia and the resource curse
- The new Russian political system: Elections
- The new Russian political system: political parties
- The new Russian political system: parliament
- Russian foreign policy
- Russia in comparative perspective
- State and democracy in the new Russia

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**PO4048 - ISSUES IN WORLD POLITICS**  
**ECTS Credits:** 6

**Politics and Public Admin**

**Rationale and Purpose of the Module:** This main focus of this module is to study current themes in contemporary global politics and to understand their historical development. Students will be able to locate current global issues and place them in a wider theoretical context.

**Syllabus:** The module is divided into a number of subsections that engage with an area of study in World Politics and more prominently upon an issue of structural and functional importance in International Relations. The first part of the course looks at the historical development of the International system and introduces questions such as sovereignty and the concept of globalisation, whilst the second part will be made up of a collection of developments and issues that have arisen out of the current structures within world politics.

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**PO4067 - STUDIES IN POLITICAL THOUGHT**  
**ECTS Credits:** 6

**Politics and Public Admin**

**Rationale and Purpose of the Module:** To build on the
knowledge gained during earlier modules, especially PO4022 Modern European Political Thought, by exploring the writings of a number of key political thinkers in more depth. This module will be an option in the fourth year, and is intended for those interested in exploring political theory themes in more depth. The class will follow a seminar format.

**Syllabus:** The relationship between political action and political philosophy, with particular reference to questions of freedom and virtue, explored through the thought of Plato, Machiavelli, and Foucault; the political thought of Plato as a foundation for Western philosophy; the politics of Machiavelli and his influence on the development of humanism and republicanism; Michel Foucault and the relationship between truth and power.

**Prerequisites:** PO4022

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**PO4096 - GOVERNMENT AND POLITICS IN IRELAND**

**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.

**Syllabus:** The module is designed to introduce students to Irish government and politics via the study of three main components: the institutional framework of government and administration of 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 policy making - looking at territorial administration and sub-national government, economic policy-making and the advent of partnership (co)operation; the welfare state and social policy; plus Ireland’s role in the EU and beyond.

**PO4098 - ISSUES IN WORLD POLITICS**

**ECTS Credits:** 6

**Politics and Public Admin**

**Rationale and Purpose of the Module:** This main focus of this module is to study current themes in contemporary global politics and to understand their historical development. Students will be able to locate current global issues and place them in a wider theoretical context.

**Syllabus:** The module is divided into a number of subsections that engage with an area of study in World Politics and more prominently upon an issue of structural and functional importance in International Relations. The first part of the course looks at the historical development of the International system and introduces questions such as sovereignty and the concept of globalisation, whilst the second part will be made up of a collection of developments and issues that have arisen out of the current structures within world politics.

**PO4102 - METHODS AND RESEARCH IN POLITICAL SCIENCE**

**ECTS Credits:** 6

**Politics and Public Admin**

**Rationale and Purpose of the Module:** This module will develop students knowledge of research and methods by introducing them to theory building, research design, and methods of data collection and analysis.

**Syllabus:**

1. The Scientific Study of Politics
2. Theory Building
3. Evaluating Causal Relationships
4. Research Design
5. Measurement
6. Descriptive Statistics and Graphs
7. Statistical Inference
8. Bivariate Analysis
9. Bivariate Regression Analysis
10. Multiple Regression Analysis

**PO4108 - MULTICULTURALISM AND POLITICAL THEORY**

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**PO4118 - IRELAND AND EU MEMBERSHIP:**

**ECTS Credits:** 6

**Politics and Public Admin**

**Rationale and Purpose of the Module:** This module takes up some contemporary themes in political theory, examining the concepts of justice, freedom, equality, democracy, pluralism and respect in light of the demands for greater recognition and accommodation that have been put forward by ethnic, racial, religious, and linguistic minorities. The aim of this module is to explore the formidable problems raised by the challenge of cultural diversity from the perspective of normative political theory, and in particular to evaluate the range of alternative justifications for multicultural political policies.

By the end of the module, students should be aware of the various rights claims, policy proposals and political alternatives that have been suggested by and on behalf of minority cultural communities; have a sense of the challenges these pose to established liberal theories and to liberal-democratic practices; be able to critically evaluate the various justifications offered; understand a range of arguments for and against

**Syllabus:** Multiculturalism and Political Theory; Pluralism; Citizenship; Toleration; The Politics of Recognition; Liberal Culturalism; Cosmopolitan Criticisms; Feminist Objections; Democracy and Minority Representation; Education and Cultural Diversity; Headscarves; Universalism, Ethnocentralism and Relativism

**PO4118 - IRELAND AND EU MEMBERSHIP:**

**ECTS Credits:** 6

**Politics and Public Admin**

**Rationale and Purpose of the Module:** This module aims To examine the nature and impact of Ireland’s membership of the EU To explore the theoretical interpretations of Europeanisation To systematically investigate the impact Europeanisation has had on protected policy domains in Ireland To identify the domestic and global factors which mediated the Europeanisation process and to assess the learning and adaptation which led to changes in Ireland’s political and policy processes.
**PO5012 - EXTERNAL RELATIONS OF THE EUROPEAN UNION**

**ECTS Credits:** 9

**Politics and Public Admin**

**Rationale and Purpose of the Module:** The purpose of this module is to examine, and critically evaluate, the EU as a global actor. The evolution of the Unions Common Foreign and Security Policy (CFSP) will provide the backdrop for a discussion of ways in which the EU (as a “normative power”) seeks to transmit influence and values beyond its own borders.

**Syllabus:**
- Historical development of EU external policies
- Europeanisation as a broker of change between Northern and Southern Ireland.
- Assessing the impact of Europeanisation and the influence of the mediating factors.
- Reflecting on new patterns of governance.

Module review.

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**PS4022 - PSYCHOLOGY OF THE PERSONALITY**

**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.

Prerequisites: PS4032, PS4031

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**PS4032 - PSYCHOLOGY AND SOCIAL ISSUES**

**ECTS Credits:** 6

**Psychology**

**Rationale and Purpose of the Module:**
- This module will explore a range of contemporary social issues bringing to bear upon them the methods and theoretical perspectives of psychology in an attempt to better understand their causes and consequences. Using the social issue as a focus, students will gain insight into the discipline of psychology and engage in debating and evaluating the theory and method of psychology.
- Through a psychological analysis of the causes and consequences of social issues students will gain insight into how these issues might be resolved.

**Syllabus:** Issues covered will include; the media and human behaviour; social conflict; the use and abuse of power; sex and sexuality; society and mental health; social inclusion and exclusion; bullying at work; equality and advocacy; parenting and childcare; the environment

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**PS4033 - RESEARCH METHODS**

**ECTS Credits:** 6

**Psychology**

**Rationale and Purpose of the Module:**
- For students to receive an overview of research within the field of psychology.
- For students to develop knowledge of the academic discipline of psychology through indepth interrogation of the concepts and principles of the variety of paradigms and epistemologies across psychological research.
- Students will develop their laboratory and field research and writing skills.
- By the end of the module students should be able to describe and explain the following aspects of research in psychology:
  - The epistemological principles underlying the diversity of collection methods
  - Advanced bivariate inferential statistics
  - Key aspects of psychological ethics including informed consent, deception, anonymity and confidentiality.
  - Psychometric properties of standardised tests

**Syllabus:** Consolidation and development of students' previous research training in psychological research methods. A review of research methods in psychology;
introduction to advanced statistics, research concepts and terminology. A review of the scientific method as used in psychology research. Learning how to access research findings in the literature. Advanced ethics and ethical practice in research. Qualitative and quantitative paradigms and methods. Advanced issues in questionnaire design. Psychometric properties of tests. Advanced issues in sampling of selected populations. Drafting and presenting the psychological report.

Prerequisites: PS4042, PS4021

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**PS4034 - EMPIRICAL PSYCHOLOGY 2**
ECTS Credits: 6

**Psychology**

Rationale and Purpose of the Module: To develop students' ability to design, collect, code and analyse empirical data using non-experimental approaches in psychology

**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 shortcomings associated with the traditional experimental approach and familiarises them with alternative correlation and observational paradigms via a series of practicals. Students learn to design, conduct, code and analyse quantitative psychometric data whilst paying due consideration to the welfare of participants and attending to the appropriate ethical guidelines.

Prerequisites: PS4042, PS4041

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**PS4037 - COGNITION 1**
ECTS Credits: 6

**Psychology**

Rationale and Purpose of the Module: To provide core area coverage of the field of cognitive psychology - a sub-discipline of psychology concerned with the study of the mental processes that underlie human behaviour.

**Syllabus:** Cognitive processes cover a broad range of research domains including; memory, attention, perception, knowledge representation, reasoning and problem solving. In this module, through an empirical (including practical demonstrations) and theoretical examination of cognitive processes, students will develop their knowledge of central aspects of cognition including perception, memory and attention.

Prerequisites: PS4042, PS4021

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**PS4042 - PSYCHOLOGY: THEORY AND METHOD 2**
ECTS Credits: 6

**Psychology**

Rationale and Purpose of the Module: To cover the main paradigms, concepts, issues, and debates in the core areas of cognitive psychology and developmental psychology.
To develop students' research and data analysis skills, specifically through the use of experimental methods and inferential statistics.

**Syllabus:** This module is the second of two which provide coverage of the main paradigms, concepts, issues, and debates within the core areas of psychology. The section detailing developmental psychology will cover the main theoretical approaches to the study of human development from prenatal and childhood biological development to theories of socio-emotional development across the lifespan. The section on cognitive psychology will cover the basic cognitive models of memory and thinking. The key debate of the utility and limitations of the metaphor of 'the brain as information processor' will be common to both areas. In the laboratory classes, students will be required to employ basic principles of experimental design; data entry and analysis using SPSS; probability testing and inferential statistics.

Prerequisites: PS4011

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**PS4052 - PRACTICAL PSYCHOLOGY 2**
ECTS Credits: 6

**Psychology**

Rationale and Purpose of the Module: To develop students understanding of the range of laboratory-based activities in psychology and to provide opportunities for students to undertake practical studies in psychology and in so doing develop students' ability to collect, code and analyse empirical data.

**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 the experimental and survey methods are developed through the use of selected examples. Students are encouraged to become increasingly familiar with SPSS for coding of data and simple inferential statistics are introduced.

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**PS4107 - ABNORMAL AND CLINICAL PSYCHOLOGY**
ECTS Credits: 6
Sociology, social anthropology and social cognition it explain large psychology originated in an interdisciplinary effort to outline the implications of these for the discipline methodologies employed in social psychological research. This module places the Social Identity perspective in its historical context and introduces students to cognate theories and methods elsewhere in social psychology and in other disciplines with a view to enriching their understanding of social psychology. Topics include: evolution of the Social Identity approach; advances in Self Categorisation Theory; discursive approaches to social identities; ethnography and displays of identity; approaches to national identity.

Rationale and Purpose of the Module: Abnormal psychology is the study of mental illness and distress, as well as psychological dysfunction. The aim of this module is to foster a critical appreciation of some key topical issues at a theoretical level in abnormal psychology, as well as how this is applied in the practice of clinical psychology.

Syllabus: Through a series of lectures, students will be introduced to the theoretical perspective on several categories of common mental health disorders, including mood and anxiety disorders. In addition, other topics in abnormal psychology, such as dysfunctional behaviour, will be examined from a range of perspectives, including cognitive, behavioural, and neurological. The focus is on how psychological models, particularly cognitive ones, can aid our understanding of psychological disorders. The course will also examine how the theoretical understanding of disorders translates into practice in clinical settings. Contemporary models of clinical practice and psychotherapeutic intervention will be introduced, including scientist and reflective practitioner models, and formulation and assessment models of clinical psychology. The link between clinical psychology and health care settings will also be explored. In this way we will demonstrate that psychological models have considerable application to clinical practice. This provides a valuable introduction to key issues and concepts that will be experienced in clinical practice, by students who decide to move into clinical work after graduation.

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PSYCHOLOGY
ECTS Credits: 6

PS4108 - APPROACHES TO SOCIAL IDENTITY
ECTS Credits: 6

Psychology

Rationale and Purpose of the Module: For students to develop an understanding of the different theoretical approaches to the study of social identities in psychology as compared to those in other disciplines. To introduce students to the range of epistemologies and methodologies employed in social psychological research and to outline the implications of these for the discipline of psychology more generally.

Syllabus: The Social Identity approach in social psychology originated in an interdisciplinary effort to explain large-scale intergroup conflict. Drawing upon sociology, social anthropology and social cognition it aimed to provide a comprehensive account of intergroup relations from the individual perspective to the group level. However, in the four decades since its inception the Social Identity approach has become overwhelmingly cognitive and experimental in focus and lost links with other disciplines and methodologies. This module places the Social Identity perspective in its historical context and introduces students to cognate theories and methods elsewhere in social psychology and in other disciplines with a view to enriching their understanding of social psychology. Topics include: evolution of the Social Identity approach; advances in Self Categorisation Theory; discursive approaches to social identities; ethnography and displays of identity; approaches to national identity.

Prerequisites: PS4011

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PS6041 - ADVANCED RESEARCH DESIGNS IN PSYCHOLOGY
ECTS Credits: 6

Psychology

Rationale and Purpose of the Module: The purpose of this module is to increase teach students how particular research questions relate to particular research designs. Students will get a good understanding of advanced research designs and how they can be developed for experimental and non-experimental psychological research, in both basic and applied research domains. Besides providing the necessary knowledge about advanced research designs, this model seeks to prepare students for their own research (i.e., their Major Research Project).

Syllabus: This module covers the rationale of methods in both basic and applied research. Students will learn how to investigate research questions by using the appropriate research designs. Pros and cons of several research designs will be discussed. Specifically, we will discuss the merits of experimental methods, non-experimental methods, qualitative methods, implicit methods, explicit methods, computer simulations, and mixed-methods approaches. Besides teaching students the rationale of advanced research designs, this module seeks to teach students the tools that may need for their own research.

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PS6061 - PROFESSIONAL SKILLS IN PSYCHOLOGY
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 we 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.

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PS6081 - PROBLEM SOLVING AND DECISION MAKING
ECTS Credits: 6

Psychology

Rationale and Purpose of the Module: The aim of this module is to provide in-depth knowledge on typical strategies that people use in problem solving and decision making and how solutions to problems and decision can be improved. This module will provide a deep understanding of problem solving and decision making and it will increase the students analytical skills.

Syllabus: People solve problems and make decision all of the time, but only sometimes do people succeed. In this module, students will learn about the prominent theories and applications in problem solving and decision making. We will touch on different kinds of problems and decisions (personal, inter-personal, group context) in different contexts (e.g., relationships, economics). We will contrast typical strategies that people use to the strategies that would make problem solving and decision making more effective and efficient.

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PT4001 - SUSTAINABLE DEVELOPMENT
ECTS Credits: 6

Design and Manufacturing Technology

Definitions and contexts for understanding social and
human aspects of sustainable development, critical thinking, challenging assumptions, examination of knowledge creation, semiotics.

Climate change, the physical science and international politics, energy, energy use in everyday living, transport, sources of energy and GHG emissions for different sources, energy dependence, renewable energy (wind, biofuel, solar, wave), efficiency and conservation, peak oil.

The economics of sustainability, does sustainable innovation enable sustainable growth? Consumption and production, environmental impact of everyday things, how marketing influences, life cycle thinking, behavioural thinking, systems change and intervention, creativity and innovation, corporate social responsibility, ethical investment.

Food, sustainable food production, energetics of food production, sustainability of the food chain.

Sustainability and public policy, sustainable development in the national context, the public policy making process, horizontal policy issues, regional and local, European Community and the environment. Sustainability metrics, using scientific analysis to quantify sustainability as guidance for policy makers, environmental taxes, non-environmental subsidies.

Sustainable communities, building sustainable community action, bottom up approaches, role of local democracy and environmental and social movements, local agenda 21.

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**PT4004 - INTRODUCTION TO QUALITY MANAGEMENT**

**ECTS Credits:** 6

**Design and Manufacturing Technology**

**Rationale and Purpose of the Module:** The aim of the module is to give an effective and functional overview of Quality Management. It will: 1. Introduce the student to the basic concepts of Quality Management; 2. Inform the student about the role that quality plays in the workplace and impact that quality has on the organisation as a whole; 3. Make the student aware of the how to implement a range of quality strategies and tools.

**Syllabus:**
1. What is Quality and why is it important;
2. Quality Control / Assurance;
3. Quality Management Systems,
4. Development of Total Quality Management;
5. Continuous Improvement;
6. Documentation, Audits, Standards (ISO9000:2000);
7. Human Resource issues,
8. Quality Tools and techniques: Quality Function Deployment, Failure Mode and Effects Analysis, Statistical Process Control, Six Sigma; Benchmarking

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**PT4012 - DECISION SUPPORT TOOLS**

**ECTS Credits:** 6

**Design and Manufacturing Technology**

**Rationale and Purpose of the Module:** To prepare students to take an active part in developing IT systems that reflect the needs and priorities from their working perspective.

**To apply some elementary programming and information handling concepts in the context of technology management.**

**Syllabus:** Spreadsheet basics: MS Excel, cell attributes (number, character formats), relative/absolute, formulas functions inc arithmetic, trig, conditional), row/column calculations, configuring charts (category data line/bar, scatter plots, primary/secondary axes, formatting), row/column calculations, functions (sum, sumproduct, statistical, financial), linking between worksheets, add-ins, pivot tables, macros.

Spreadsheet automation: macros, visual basic for applications MS VBA, conditional looping and branching, vector (list) and matrix (array) lookup.

Applications to observation and data analysis for building an evidence base: experimental observations (1) continuous variables (time), work hard versus work smart experiment, t-test to compare outcomes (manual and excel function). (2) binary attribute variable (present/absent), occurrence sampling, confidence intervals, chart on number line. (3) associative relationship: linear regression curve-fitting, trendline fit to observed data, extension to non-linear regression-based models.


Optimisation: MS Solver add-in, most profitable mix of products subject to constraints of capacity, market, and material availability.

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**PT4015 - LEAN THINKING AND LEAN TOOLS**

**ECTS Credits:** 6

**Design and Manufacturing Technology**

**Rationale and Purpose of the Module:** To introduce the main elements of the Lean process improvement framework, focusing on quantity control and human engagement, through lectures, readings and laboratory experience.

**To prepare students to engage in performance improvement projects during Coop.**

**Syllabus:** Introduction to lean and continuous improvement philosophy in context of quantity control and its relationship with quality control and broad business processes such as new product development and supply-chain. Forms of waste and PDSA. Supply-chain context, supply chain reference model SCOR and performance criteria. Problem identification and SS, as initiation for structured problem analysis and enquiry. Process mapping, focusing, critical questioning, and process improvement. Work standardisation, allowances, rating, and standard work.

Work-flow, types of layout, consequences: material movement, Little’s law, flow factor. Systematic Layout Planning, layout design and improvement. Inventory control, classical economic order quantity, safety stocks, batch size and consequences: Little’s law, flow factor and variability effects. Push planning (MRP/CRP/MRPII). Setup time, setup time reduction programmes, SMED, flow factor, flexibility and commercial significance. Pull material flow systems eg kanban, drum-buffer-rope. Production line balancing and production flow smoothing, goal-chasing methods, and significance. Engagement of people, kaizen and process improvement teams, organisational conditions eg structure, culture and reward systems. Lean thinking, policy deployment and organisational cohesion.

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**PT4022 - INTRODUCTION TO QUALITY MANAGEMENT**

**ECTS Credits:** 6

Decision philosophy: continuous improvement PDSA, evidence-informed decisions, scale of scientific evidence used in healthcare delivery.
Design and Manufacturing Technology

Rationale and Purpose of the Module: The aim of the module is to give an effective and functional overview of Quality Management.
It will:
1. Introduce you to the role that Quality Management plays in the workplace
2. Make you aware of the how to implement a range of quality strategies and tools
3. Inform you about the impact that quality has on the organisation as a whole

2. Total Quality Management, human resource issues, sourcing policy
3. Quality Costs
4. Problem solving tools
5. Benchmarking and Quality Function Deployment.

PT4025 - SIMULATION MODELLING AND ANALYSIS
ECTS Credits: 6

Design and Manufacturing Technology

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..

PT4112 - MANUFACTURING TECHNOLOGY 2
ECTS Credits: 6

Design and Manufacturing Technology

Rationale and Purpose of the Module: To introduce the student to a further range of manufacturing and fabrication processes and the relationship between materials and processes.
To emphasise the importance of accuracy and precision.

Syllabus: Engineering measurement.
Length standards.
Standard measuring temperature.
Process Capability.
Quality and Accuracy.
Machining - further consideration of sawing, turning, milling, drilling.
Fundamental treatment of the shear plane - relation between the rake angle and the shear plane and implications for power requirements.
Workholding - methods of clamping, magnetic workholding, chucks and collets.
Welding techniques including : manual metal arc, oxy-acetylene, MAGS and TAGS welding.
Brazing, soldering and adhesive bonding.
Mechanical joining.
Joint design.
Introduction to engineering materials and their properties.

Prerequisites: PT4111

PT4242 - 3D CAD MODELLING
ECTS Credits: 6

Design and Manufacturing Technology

Rationale and Purpose of the Module: 3D parametric modelling systems are an integral part of the product design process. They are typically used to control key aspects of a product such as its design, communication, management, presentation, documentation and validation.

PT4428 - PROCESS DESIGN
ECTS Credits: 6

Design and Manufacturing Technology

Rationale and Purpose of the Module: To introduce the student to the science and art of New Business and Manufacturing Process Development within modern enterprises. It links the manufacturing and construction skills learnt in earlier modules with the design of processes. The project is intended to take the student through the basic design process into requirements engineering, market analysis, materials, manufacturing process for an organisation.

Syllabus: Design of a Manufacturing Supply Chain. - Business Process
- Business Process Creation/Re-Engineering. (BPR)
Self Assessment and Process Benchmarking of Enterprises. European Foundation Quality Model, Malcom
PT4518 - AUTOMATION T 3
ECTS Credits: 6

Design and Manufacturing Technology

Rationale and Purpose of the Module: This module introduces the concept of Computer Integrated Manufacturing and the underlying technologies that support it. These include CAD, database management systems, data modelling, expert systems, MRP, MRP II, and computer aided production and inventory control. To provide an understanding of the role of management accounting in the manufacturing process and familiarise students with the techniques used.


PY4022 - PHYSIOLOGY AND ANATOMY
ECTS Credits: 3

Physical Education & Sport Sciences

Rationale and Purpose of the Module: This module offers a unique opportunity to become familiar with both practical and theoretical concepts in (1) kinesiology, the study of human movement, and (2) physiology, the study of how the body functions.

Aims:
- To enable students to understand the basic anatomy of the musculo-skeletal system and how the system functions in normal motion such as walking gait.
- To enable students to understand the basic physiology of the systems which support movement in the body.
- To provide students with an in-depth knowledge of all
the components of physical fitness and how measurement plays a critical role in developing this understanding.

Syllabus: Anatomical terms and definitions. Identification and functions of the musculo-skeletal system. Structure and type of bones and muscles. Kinesiological analysis of simple joint movements and analysis of posture. Forms of motion. Introduction to injury prevention and analysis. The nervous system and the brain; nerve structure and function, nerve transmission; the action potential, the neuromuscular junction, neurotransmitters; The central nervous system, the peripheral nervous system, autonomic and somatic nervous systems. Structure and function of muscle fibres; organisation into motor units; Motor unit recruitment in muscle contraction. Functional properties of muscle. The circulatory system; structure and function of the heart; blood vessel structure and function; blood pressure and its measurement. The respiratory system; structure and function of the upper respiratory tract, the lungs, pulmonary ventilation, and pulmonary gas exchange.

PY4026 - YOUTH SPORT AND POLICY
ECTS Credits: 6

Physical Education & Sport Sciences

Rationale and Purpose of the Module: The purpose of this module is to encourage students to examine the relationship between the three pillars of physical education, extra-curricular sport and sport outside school and the potential role of the physical education teacher and coach in each pillar.

Syllabus: Students will be introduced to the current youth sport provision in Ireland available through the existing pillars of physical education, extra-curricular sport and sport outside school and possible motivations for involvement in youth sport (sampling/specialisng/investing). Students will identify the elements of quality coaching and engage with the extent to which communication, methodologies and the management of the training / learning environment are evident in coaching and teaching contexts.

PY4036 - RESEARCH METHODS FOR PHYSIOTHERAPY 2
ECTS Credits: 6

Clinical Therapies

Rationale and Purpose of the Module: This module will focus on the formulation of a research question and the completion of a literature review relating to your chosen topic. In addition, students will also prepare and submit an ethics proposal at the end of the term. This proposal will preferable form the starting point of the Final Year Project (FYP). The skills acquired in this module will form the basis of the FYP and will also provide students with the skills necessary for undertaking further research in their professional careers.

Syllabus: The module will build on skills that have students have previously acquired such as critical appraisal and literature searching and will follow-on from the first Research Methods Module. In addition, it will provide students with practical experience of formulating a research question, literature searching, and literature appraisal and proposal preparation. Moreover, it will provide students with a sound understanding of the process involved in applying for ethical approval for their research and the necessity for good study design.

PY4038 - QUALITATIVE BIOMECHANICS
ECTS Credits: 6

Physical Education & Sport Sciences

Rationale and Purpose of the Module: Rationale: While a sound knowledge of anatomical structure is a prerequisite 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 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. 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. This module builds directly on the material of SS4302, the basic physics module a

Syllabus: SYLLABUS


Prerequisites: PY4022

Rationale and Purpose of the Module: The module aims to enable students to critically examine philosophical issues related to Physical Education including areas such as: ? Knowledge and the curriculum ? Moral education ? Aesthetic and artistic aspects To provide a theoretical framework for participation as performer and spectator.

Syllabus:
Week 1 - Introduction - Basic Philosophical Concepts
Week 2 - Philosophy and Physical Education - the Context
Week 3 - Values in the Physical Education Curriculum
Week 4 Curriculum Values in the Irish Physical Education Curriculum
Week 5 - Physical Education & the Nature of Knowledge
Week 6 - Some Ethical Considerations
Week 7 - Issues regarding Winning and Losing
Week 8 - Perceptions of the Body
Week 9 û Aesthetic and Artistic distinctions?

Creativity and the education of feeling.
Week 10 - Moral issues in Sport and Physical Education
Week 11 û Movement, Meaning, Art and Gender
Week 12 - Final considerations: Leaving Certificate Aesthetic/Artistic Programmes

Topics to include:
1. Justification of Physical Education as a curriculum area
2. Criteria for selection of curriculum content in Physical Education
3. Knowledge and Physical Education
4. Potential for moral and aesthetic education within Physical Education
5. Artistic and aesthetic elements in Physical Education
6. Creativity and Physical Education
7. Feeling, reason and perception in the Arts (with special reference to Dance)

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**PY4044 - Psychology for Physiotherapists 2**
**ECTS Credits: 6**

**Clinical Therapies**

**Rationale and Purpose of the Module:** To introduce students to lifespan development and challenges that may occur using an evidence based approach
To develop students abilities to integrate sources of knowledge to examine the complexity of clinical practice and human behaviour

**Syllabus:** Lifespan development form cradle to grave, life events such as transition periods, leaving home, parenthood, divorce, bereavement

**Prerequisites:** PY4021

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**PY4046 - PEDAGOGY OF DANCE / GYMNASTICS 2**
**ECTS Credits: 3**

**Physical Education & Sport Sciences**

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**PY4048 - PEDAGOGY, EXERCISE AND CHILDREN’S HEALTH**
**ECTS Credits: 6**

**Physical Education & Sport Sciences**

**Rationale and Purpose of the Module:** The module gives the students an opportunity to critically examine the role physical education plays in promoting physical activity and the health of the individual and the nation. The role of Health Related Activity and Kinesiological Aspects on the curriculum is examined and means of successfully providing this aspect of the curriculum are discussed. Additionally, students require the opportunity to consider and reflect on various models of teaching, which cater for different populations.

**Syllabus:** Theoretical: Definitions relating to physical activity, health and health promotion. The Wellness model. Overview of benefits of participation. Recommended amounts of physical activity, latest guidelines. Assessment and levels of Physical Activity. Determinants of participation in physical activity.

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**PY4053 - PHILOSOPHY AND AESTHETICS IN PHYSICAL EDUCATION**
**ECTS Credits: 6**

**Physical Education & Sport Sciences**

**Rationale and Purpose of the Module:** The module aims to enable students to critically examine philosophical issues related to Physical Education including areas such as: ? Knowledge and the curriculum ? Moral education ? Aesthetic and artistic aspects To provide a theoretical framework for participation as performer and spectator.

**Syllabus:**
Week 1 - Introduction - Basic Philosophical Concepts
Week 2 - Philosophy and Physical Education - the Context
Week 3 - Values in the Physical Education Curriculum
Week 4 Curriculum Values in the Irish Physical Education Curriculum
Week 5 - Physical Education & the Nature of Knowledge
Week 6 - Some Ethical Considerations
Week 7 - Issues regarding Winning and Losing
Week 8 - Perceptions of the Body
Week 9 û Aesthetic and Artistic distinctions?
conflict) as well as the ōartō of teaching and leadership (developing trust, communicating with sensitivity, finding your own niche within a team of leaders, balancing intellect with intuition, and inspiring those you lead).

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**PY4062 - HUMAN ANATOMY 2 (LOWER EXTREMITY)**  
ECTS Credits: 6

**Clinical Therapies**

**Rationale and Purpose of the Module:** To provide students with Comprehensive knowledge and understanding of general structural and functional organisation of the lower extremity, pelvis and the cardiorespiratory system. To enable students to understand the structure and function musculo-skeletal framework of the lower extremity, pelvis and the cardiorespiratory system. Functional relevance of all anatomical structures is emphasised to enable students to appreciate the significance of interrelationships of structure to function. An understanding of application of core anatomical knowledge to clinical conditions is developed through problem-integrated learning. This module also enables students to appreciate the interrelationships of the individual constituent parts of the upper extremity to the body as a whole.

**Syllabus:** Functional / Applied Anatomy and detailed structure of the pelvic girdle, hip joint, knee joint, tibio-fibular articulations, the ankle and foot joints is studied. Analysis of basic functional activities involving lower limb is carried out. This includes anatomy of bones, articular surfaces, joint stability, support, plane and range of motion, factors affecting range of motion; synovial membrane, ligaments, blood and nerve supply, lymphatic drainage, and muscle attachments. Detailed anatomy of thoracic cavity, mechanics of respiration; and the pelvic floor anatomy are explored; Introduction to peripheral nerve anatomy is also incorporated [causes & consequences of injuries to lower limb nerves].

**Prerequisites:** PY4001

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**PY4072 - PEDAGOGY OF INVASION GAMES 1**  
ECTS Credits: 3

**Physical Education & Sport Sciences**

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**PY4094 - TEACHING AND LEARNING FOR INDIVIDUALS IN PHYSICAL EDUCATION**  
ECTS Credits: 3

**Physical Education & Sport Sciences**

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**RE4006 - SPATIAL ROBOTICS**  
ECTS Credits: 6

**Electronics & Computer Engineering**

**Rationale and Purpose of the Module:** This module covers a broad range of the necessary enabling and advanced technologies required for the design, integration and operation of Modern Robots including industrial robotic arms and mobile robots.


**Prerequisites:** ET4224

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**RE4017 - MACHINE VISION**  
ECTS Credits: 6

**Electronics & Computer Engineering**

**Rationale and Purpose of the Module:** This module introduces students to one of the key enabling technologies that is necessary for modern robotics design, machine vision. At the end of this module students will be able to use common techniques for the design, specification and practical implementation of modern vision systems


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**RM4002 - RESEARCH METHODS IN LANGUAGES, LITERATURE AND CULTURAL STUDIES 2**  
ECTS Credits: 6

**School of Languages, Literature, Culture and Communication**

**Rationale and Purpose of the Module:** This module introduces students to the academic study of languages, literature and cultural studies, with a specific focus on the theoretical approaches used in languages, literature and cultural studies. The module provides training in essential research skills, equipping participants to pursue self-directed study, to individually research a topic, to apply the appropriate tools and methods of research, to source and use primary archival materials, and to present findings appropriately. The aims of the module are: To introduce students to the theoretical approaches used in languages, literature and cultural studies; To equip students with the necessary skills to carry out a research project and to present findings appropriately; To equip students with the research skills for sourcing, storing and presenting research data; To enhance students' awareness of the information technology skills necessary to develop the above research skills.
**Syllabus:** Students undertaking research in languages, literature and cultural studies will be introduced to the theoretical approaches used by researchers in each of these disciplines and will engage in the evaluation of the critical readings of scholars in their discipline in light of such theoretical frameworks. Incorporating a practice-based element, students will be equipped with the necessary skills to design and carry out a research project in their selected discipline. Through small group discussion- and writing-focused workshops, students will be engaged in activities to develop the appropriate skills to collect, interpret and present research data appropriately, and to share their research findings with peers in verbal, visual and written forms.

**Prerequisites:** RM4001

**SE4006 - SCIENCE TEACHING 3**
**ECTS Credits:** 6

**Life Sciences**

Review of the Senior Cycle Science syllabuses (Biology, Agricultural Science, Chemistry, Physics, as appropriate); structure and rationale for the syllabus. Structures of subject knowledge; innovation in the classroom/laboratory/workshop; curriculum development; justification for inclusion of the subject on the curriculum; mixed ability teaching; alternative approaches to assessment; varieties of teaching/learning styles; classroom/workshop/laboratory organisation; international perspectives; cross curricular aspects.

**Rationale and Purpose of the Module:** The purpose of this module is to introduce students to basic sociological concepts and models of understanding in relation to health and illness. Students will be expected to develop an understanding of the social factors that influence health status, as well as an understanding of how sociology may be relevant to understanding the social context of healthcare policy and health work.

**Syllabus:** Social definitions of health and illness, debates in medical sociology, social causes of illness, social patterns of illness, models of healthcare, social aspects of healthcareer practice, social implications of contemporary healthcare policy.

**SN4003 - SOCIAL SCIENCE 1, SOCIOLOGY OF HEALTH AND ILLNESS**
**ECTS Credits:** 6

**Nursing & Midwifery**

**Rationale and Purpose of the Module:** This module introduces students to basic sociological concepts and models of understanding in relation to health and illness.

Students will be expected to develop an understanding of the social factors that influence health status, as well as an understanding of how sociology may be relevant to understanding the social contexts of healthcare policy and health work.

**Syllabus:** Sociological models/theories of health and illness; social factors (especially gender, ethnicity and class) effecting health chances; socio-cultural health beliefs and research on chronic illness; illness-related stigma; theories of professionalization; gender and power relations; 'sick role' theory. Social context of health care provision: healthcare policy (historical and contemporary context); equity and healthcare structures; professionalization of nursing and midwifery; social power of medicine; healthcare division of labour; changing relationship between nurses and doctors. Social context of health care for clients: access to services professional-patient relationships. Contemporary politics of health care: crisis in welfare; crisis in health care; social implications of health care policy; changing context of health work.

**SE4014 - TEACHING SCIENCE 1**
**ECTS Credits:** 6

**Life Sciences**

**Rationale and Purpose of the Module:** Elements of Teaching 1 and Teaching 2 (existing modules SE4014 and SE4024) are being incorporated into a single module, in order to facilitate restructuring of the LM092 programme to comply with accreditation requirements of the Teaching Council.

**Syllabus:** Junior Certificate Science syllabus; rationale, structure, content and assessment; cross-curricular aspects. Transition from Primary to Second level; Curaclam na Bunscoile. Application of learning theory to the teaching of science; teaching methodology; project work; critical reflection; classroom/workshop/laboratory exercises and organisation; data loggers, their use and integration into the teaching of science. Preparation and evaluation of schemes of work and lesson plans. Teaching resources, to include the range of teaching aids and textbooks, e-learning resources, learning enhancement possibilities.

The management of active learning situations in the laboratory and the field; design and execution a wide range of laboratory and field-based investigations and experimental work reflective of the objectives of the Junior Science syllabus; evaluation of their effectiveness as an aid to teaching and learning. Preparation of laboratory chemicals and reagents; using the natural environment as a teaching resource. Laboratory safety considerations; safety, efficiency and expertise in a range of common junior cycle laboratory procedures; legal responsibilities, accident response and reporting.

**SN4202 - SOCIAL SCIENCES 2: SOCIOLOGY OF HEALTH AND ILLNESS**
**ECTS Credits:** 6

**Nursing & Midwifery**

**Rationale and Purpose of the Module:** This module introduces students to basic sociological concepts and models of understanding in relation to health and illness.

Students will be expected to develop an understanding of the social factors that influence health status, as well as an understanding of how sociology may be relevant to understanding the social contexts of healthcare policy and health work.

**Syllabus:** Sociological models/theories of health and illness; social factors (especially gender, ethnicity and class) effecting health chances; socio-cultural health beliefs and research on chronic illness; illness-related stigma; theories of professionalization; gender and power relations; 'sick role' theory. Social context of health care provision: healthcare policy (historical and contemporary context); equity and healthcare structures; professionalization of nursing and midwifery; social power of medicine; healthcare division of labour; changing relationship between nurses and doctors. Social context of health care for clients: access to services professional-patient relationships. Contemporary politics of health care: crisis in welfare; crisis in health care; social implications of health care policy; changing context of health work.

**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
Syllabus: This module equips students with a critical understanding of key concepts in gender studies and feminist thought and how these are informed by, and inform, sociological enquiry. It offers in introduction to the main sociological perspectives on gender; key debates in feminist theory; debates in the study of masculinity; and perspectives on substantive topics such as work and care in the context of these frameworks. The module also examines the operation of gender divisions across national and transnational social contexts and their articulation with other major social divisions such as class, sexuality, ethnicity and race.

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, aG-localization/E and Media Audiences.
* Media Ownership, concentration and conglomereration.
* The political economy perspective. The public sphere.
* Media production and media professionals.
* Structure and agency in a media setting.
* HallIEs 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.

Rationale and Purpose of the Module: This module is to introduce students to sociological approaches to gender including the main theoretical frameworks in the study of gender and society.

b) Develop students understanding of the discipline of sociology in the contemporary context, taking account of changing intellectual and social contexts.

c) Demonstrate how these theories have been influenced by classical social theories in terms of how they - challenge key classical presuppositions about the nature and scope of sociology in understanding the social world;
- their level of indebtedness to or departure from classical theoretical antecedents.

d) Enable students to differentiate between different theoretical approaches in relation to key sociological concepts such as structure and agency, rationality and reflexivity, objectivism and subjectivism, micro-analysis and macro-analysis.

Syllabus: This module aims to broaden and deepen students engagement with and understanding of the development of sociology as a discipline following on from their introduction to the sociological classics. It introduces students to a selection of modern and contemporary theories as a way of understanding how sociological theory has developed to reflect changing social and intellectual contexts. The course will identify the extent to which the selected theories build on key classical presuppositions or offer more radical departures in terms of the key analytical debates within sociology.

As a way of elucidating these issues, substantive topics will be discussed in relation to the different theoretical perspectives. The range of theoretical perspectives will encompass the following: social constructionism (Berger and Luckmann); the sociology of the everyday (e.g. Goffman, Blumer); critical theory (e.g. Foucault, Habermas, Feminist Theory and theories of late/post-modernity; theories of rationality (Rational Choice/Rational Action theory)); and the theory of social practice (Bourdieu).

Syllabus: Working from a sociological perspective, this module will document the changing theoretical and methodological paradigms that the study of media audiences has gone through and the impact that these frameworks have had on the nature of research produced and knowledge acquired about the composition and abilities of media audiences in an increasingly media saturated society. The impact of such processes as globalisation, politics and the public sphere, the rise of popular entertainment, the internet and the recent explosion of new media products(e.g. online/offline gaming, Facebook, MySpace, Twitter, and YouTube), and the study of media fans will be discussed. Overall it is hoped that students will become more reflexive about their media usage and develop a new level of understanding about the role that media consumption has on their daily lives.

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.

Rationale and Purpose of the Module: The purpose of this module is to introduce students to the emerging area of media audiences. It is built around a number of key issues and concerns that exist around studying media audiences and will address the significant theories and debates on media audiences. Emphasis will also be placed on the development of practical audience research skills which students will be asked to demonstrate and apply to the tasks outlined in their course assignments.

Rationale and Purpose of the Module: The aim of this module is to introduce students to a selection of modern and contemporary theories following on from their introduction to the sociological tradition.

Rationale and Purpose of the Module: The purpose of this module is to introduce students to the emerging area of media audiences. It is built around a number of key issues and concerns that exist around studying media audiences and will address the significant theories and debates on media audiences. Emphasis will also be placed on the development of practical audience research skills which students will be asked to demonstrate and apply to the tasks outlined in their course assignments.

Rationale and Purpose of the Module: This module considers quantitative research in relation to sociology. This module aims to develop students knowledge gained in SO4053 to increase and deepen their understanding of facility with quantitative research methods; particularly to develop their facility in the analysis of quantitative data. The primary objective of the course is
to ensure that students are able to understand and use basic quantitative methods. The course begins by reviewing the role of quantitative methods in sociology, with consideration of the theoretical implications of the method and of the sorts of research it permits. It then moves on to a practical core, introducing basic techniques for data collection, processing, presentation and statistical analysis. The lectures run in parallel with lab sessions, in which students use SPSS and other relevant software.

Syllabus: This course introduces students to the basic statistical analysis of social data, including simple descriptive statistics and presentations, samples, surveys and elementary probability theory, inferential statistics, bivariate measures of association and multivariate techniques including an introduction to linear regression and correlation. The class will provide the practical skills to analyse and draw conclusions from quantitative social science data. Emphasis will be placed on understanding, computing and interpreting basic statistics; interpreting and evaluating survey research findings; and analysing quantitative data with statistical software programmes such as SPSS.

SO4078 - INEQUALITY AND SOCIAL EXCLUSION
ECTS Credits: 6

Sociology
Rationale and Purpose of the Module: The aim of the module was to introduce the students to the dynamics and processes implicit to inequality and social exclusion. Further, to make them aware of the complexity of the conceptualisation and operationalisation of equality and social exclusion. The class will provide the practical skills to analyse and draw conclusions from quantitative social science data. Emphasis will be placed on understanding, computing and interpreting basic statistics; interpreting and evaluating survey research findings; and analysing quantitative data with statistical software programmes such as SPSS.

Syllabus: The aim of this course is to provide a comprehensive introduction to the various discourses of globalisation. It will explore some of the key meanings, history and differing theoretical perspectives and interpretations of globalisation in contemporary research, and will identify main policy issues related to economic, cultural and political globalisation. The focus will be the development of transnational communities and cultures including emerging new forms of worldwide political protest; the challenge for trade unions; culture and the ‘global’ and ‘local’ divide; the possibilities for a future global society or culture; the inter-meshing of local-global interests and identities; the inequalities and social exclusion generated by economic globalisation; and the extent to which sociology is like other disciplines needs to re-think many of its central concepts, debates and theoretical approaches in the light of globalisation processes. The analysis and discussion will be illustrated with international and Irish case studies.

SO4088 - SOCIOLOGY OF GLOBALISATION
ECTS Credits: 6

Sociology
Rationale and Purpose of the Module: a. To provide an opportunity for the student to examine key theoretical perspectives and central debates relevant to the study of globalisation
b. To offer ways of evaluating the work of major sociological schools/theorists in the study of economic, cultural and political globalisation.

c. To develop the ability to analyse and evaluate various outcomes of globalisation through a critical framework.

Syllabus: The aim of this course is to provide a comprehensive introduction to the various discourses of globalisation. It will explore some of the key meanings, history and differing theoretical perspectives and interpretations of globalisation in contemporary research, and will identify main policy issues related to economic, cultural and political globalisation. The focus will be the development of transnational communities and cultures including emerging new forms of worldwide political protest; the challenge for trade unions; culture and the ‘global’ and ‘local’ divide; the possibilities for a future global society or culture; the inter-meshing of local-global interests and identities; the inequalities and social exclusion generated by economic globalisation; and the extent to which sociology is like other disciplines needs to re-think many of its central concepts, debates and theoretical approaches in the light of globalisation processes. The analysis and discussion will be illustrated with international and Irish case studies.

SO4108 - SOCIOLOGICAL APPROACHES TO GENDER AND MULTICULTURALISM
ECTS Credits: 6

Sociology
Rationale and Purpose of the Module: a. To provide an opportunity for the student to examine 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 can 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.

SO4178 - THE SOCIOLOGY OF THE BODY
ECTS Credits: 6

Sociology

**Rationale and Purpose of the Module:** Aims: This module introduces students to the sociology of the body/embodiment. Key theoretical work is reviewed, incorporating reference to various perspectives from a range of disciplines and approaches (e.g. biology, anthropology, sociology and feminism). Empirical studies in the social sciences, exploring a range of bodily issues and practices, are also considered.

**Objectives:**
1) Locate sociological interest in the body/embodiment within its larger social context.
2) Describe and critically assess the main theoretical approaches for studying human embodiment and bodily practices.
3) Ground theoretical discussion on human bodies in empirical work from sociology and the social sciences.

**Syllabus:** The module begins by introducing students to social theory on the body and highlights the case for embodying social theory. Sociology is the main disciplinary approach taken for exploring bodies as the source, location and medium of society, but we will first underscore the socially constructed character of the body with reference to broader socio-cultural changes and anthropological theory. Attention then focuses on some key themes and debates in late modernity, such as medicalisation, risk, identity, the significance of biology, consumption and gender. More specific substantive lectures will explore themes such as: the obesity debate; disordered eating; cosmetic surgery; sport, physical activity and fitness; bodybuilding and drug-taking; tattooing; piercing; working bodies; sexualities; virtual bodies and cultures of technological embodiment (cyborgs); ageing; disability, chronic illness and healthcare; and, the body as a research instrument.

SO4188 - SOCIOLOGY OF RELATIONSHIPS, MARRIAGE AND THE FAMILY
ECTS Credits: 6

Sociology

**Rationale and Purpose of the Module:** This module examines the different aspects of relationships: love, mate selection and dating, non-marital lifestyles, marriage, reproduction and forms of parenting. A key component of the course is the influence of changing work patterns and, changing sexual values and behaviour on increasing diversity in family forms.

The objectives of this module are to:
1. Introduce students to the sociological perspective as it applies to the understanding of relationships and familial phenomena.
2. Present various sociological theories regarding love, sexual relationships, marriage and family systems.
3. Familiarise students with the results of empirical research of social scientists who study partnership formation and family behaviour.

**Syllabus:** The module explores a number of key themes: Trends in family formation and their competing theories; classifications and functions of the family especially in relation to Ireland, past and present; love, sex and courtship, exploring issues of partner choice; marriage and cohabitation, addressing the effects of cohabitation on both nuptiality and fertility; lone-parenting, various paths into and problems faced; separation and divorce, exploring trends across social groups and their correlates; re-marriage and stepfamilies with a particular focus on growing up in a step-family; work and families, analysing power relations within the family in terms of gender roles and households by discussing a range of contemporary studies of the domestic division of labour especially the impact of increasing male unemployment, the crisis of masculinity, the new man, dual burden/triple shift and the relationship between home and work; the family, state and social policy: the role of social policy and the declining family.

**Prerequisites:** SO4073, SO4001

SP4002 - INTRODUCTION TO LATIN AMERICAN CULTURE/S

ECTS Credits: 6

Sociology

**Rationale and Purpose of the Module:** This module examines the different aspects of relationships: love, mate selection and dating, non-marital lifestyles, marriage, reproduction and forms of parenting. A key component of the course is the influence of changing work patterns and changing sexual values and behaviour on increasing diversity in family forms.

The objectives of this module are:
* To introduce students to the sociological perspective as it applies to the understanding of relationships and familial phenomena.
* To present various sociological theories regarding love, sexual relationships, marriage and family systems.
* To familiarise students with the results of empirical research of social scientists who study partnership formation and family behaviour.

**Syllabus:** The module explores a number of key themes: Trends in family formation and their competing theories; classifications and functions of the family especially in relation to Ireland, past and present; love, sex and courtship, exploring issues of partner choice; marriage and cohabitation, addressing the effects of cohabitation on both nuptiality and fertility; lone-parenting, various paths into and problems faced; separation and divorce, exploring trends across social groups and their correlates; re-marriage and stepfamilies with a particular focus on growing up in a step-family; work and families, analysing power relations within the family in terms of gender roles and housework by discussing a range of contemporary studies of the domestic division of labour especially the impact of increasing male unemployment, the crisis of masculinity, the new man, dual burden/triple shift and the relationship between home and work; the family, state and social policy: the role of social policy and the declining family.
School of Languages, Literature, Culture and Communication

Rationale and Purpose of the Module: First year students majoring in Spanish need to have a general but solid knowledge of the main socio-political processes in Latin American history and their effects on and interaction with literary and film production, as well as other forms of culture, as background for further modules and as part of their overall achievement within this programme.

Syllabus: The development of Latin American culture has been marked by its multicultural and multi-ethnic history. The arrival of the Spanish Conquistadors had a massive effect in Latin American cultures and civilizations. From 1492 onwards, the construction of Latin American identities are characterised by the encounter and interaction of indigenous and African cultures and the influence of the Hispanic tradition. In order to explore the development of Latin American culture, the module will pay special attention to a number of themes, from the Amerindian civilizations to the literary boom of the 1960s, Magical Realism, and the importance of women's artistic production.

SP4132 - SPANISH FOR BEGINNERS 2
ECTS Credits: 6

School of Languages, Literature, Culture and Communication

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/himself 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 contemporary Spanish and Latin American cultures and societies. These include: transculturation and indigenous cultures in Latin America; contemporary Spanish and Latin American literature, basic concepts of Spanish linguistics. Tutorials and lab: working with set text-book, back-up audio-visual and online materials, students are introduced to past tenses, pronominal verbs and more complex structures in the Spanish language.

Prerequisites: SP4131

SP4134 - SPANISH FOR LEGAL STUDIES (BEGINNERS)
ECTS Credits: 6

School of Languages, Literature, Culture and Communication

Rationale and Purpose of the Module: Students within the BA in Law and European Studies who take Spanish as their foreign language benefit from a module that gives them an overview of the Spanish legal system and basic legal terminology. Students will compare the Irish legal system to the Spanish legal system and will acquire basic knowledge of Spanish legal terminology.

Syllabus: Extracts from newspapers and magazines, dealing with topical issues specifically related to the field of law in the Hispanic world- will be selected for reading comprehension and other related language work, developing a critical view through discussion. A selection of audio and video material will be used for oral and aural skills facilitating integration of all language skills.
Practice of new grammatical aspects of Spanish will also be included.
A class will be devoted to introducing, practising and improving the use of specific grammatical areas such as the past tenses and the introduction of the subjunctive in Spanish.

Prerequisites: SP4133

SP4142 - SPANISH LANGUAGE AND SOCIETY 2
ECTS Credits: 6

School of Languages, Literature, Culture and Communication

Rationale and Purpose of the Module: The course is designed to:
* Revise and broaden the student's knowledge of the structures of Spanish grammar.
* Expand the student's range of Spanish vocabulary.
* Improve pronunciation and patterns of intonation in Spanish.
* Further develop the student's language skills by exposing them to different situation and registers, both formal and informal.
* Facilitate the student's understanding of various cultural aspects within the Spanish-speaking world.
* Foster autonomous language learning.

Syllabus: The course is designed to: Revise and broaden the student's knowledge of the structures of Spanish grammar. Expand the student's range of Spanish vocabulary. Improve pronunciation and patterns of intonation in Spanish. Further develop the student's language skills by exposing them to different situation and registers, both formal and informal. Facilitate the student's understanding of various cultural aspects within the Spanish-speaking world. Foster autonomous language learning.

Prerequisites: SP4141

SP4146 - MODERN AND CONTEMPORARY SPAIN
ECTS Credits: 6

School of Languages, Literature, Culture and Communication

Rationale and Purpose of the Module: Consolidation of the structures, functions and vocabulary taught in the first and second years and expands grammatical competence to include complex use of the subjunctive. Further development of knowledge of contemporary Spain and Latin American cultures and societies, with a particular focus on the interaction between Spain, Europe and the wider world.

Syllabus: Tutorials: Working with set textbook, complementary audio-visual material, as well as advanced literary texts.

Prerequisites: SP4133, SP4143, SP4134, SP4934

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SPANISH SPEAKING WORLD
ECTS Credits: 6

School of Languages, Literature, Culture and Communication

Rationale and Purpose of the Module: By the end of this module students should:

* have developed further their understanding and command of Spanish grammar, vocabulary and usage.
* have improved their ability to use Spanish fluently and accurately and to make brief presentations in the language.
* have the ability to identify some of the characteristics of a variety of styles and genres, particularly in the area of media language.
* have a greater awareness of issues in translation and an enhanced ability to translate a variety of text types from Spanish to English and vice versa, particularly in the area of media language.
* understand more about a variety of issues of central importance to Spain and/or Latin America, with particular reference to the media and to other key aspects of language and society.
* have developed a critical understanding of an extended example of modern Hispanic fiction.

Syllabus: The programme is centered around a variety of topics of relevance to students of Spain and Latin America. The intention is to provide variety but a theme running through a substantial part of the module is that of the media and communication. Additionally, there will be attention given to questions of democracy, violence and the rule of law, as well as issues of gender in contemporary society, particularly with reference to the media.

Prerequisites: SP4147

SP4232 - SPANISH LANGUAGE, CULTURE AND SOCIETY 2 (BEGINNERS)
ECTS Credits: 6

School of Languages, Literature, Culture and Communication

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 her/himself 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 contemporary Spanish and Latin American cultures and societies. These include: transculturation and indigenous cultures in Latin America; contemporary Spanish and Latin American literature, basic concepts of Spanish linguistics. Tutorials and lab: working with set text-book, back-up audio-visual an online materials, students are introduced to past tenses, pronominal verbs and more complex structures in the Spanish language.

Prerequisites: SP4211

SP4242 - SPANISH LANGUAGE, CULTURE AND SOCIETY 2A
ECTS Credits: 6

School of Languages, Literature, Culture and Communication

Rationale and Purpose of the Module: The course is designed to:

* Revise and broaden the student/s knowledge of the structures of Spanish grammar.
* Expand the student/s range of Spanish vocabulary.
* Improve pronunciation and patterns of intonation in Spanish.
* Further develop the student/s language skills by exposing them to different situation and registers, both formal and informal.
* Facilitate the student/s understanding of various cultural aspects within the Spanish-speaking world.
* Foster autonomous language learning.

Syllabus: The advanced course consists of four hours of Spanish per week:
* Two language tutorials (grammar, vocabulary, communication skills, writing and reading skills).
* One laboratory/oral class (oral communication skills).
* One General Lecture

Prerequisites: SP4241

SP4246 - SPANISH LANGUAGE, CULTURE AND SOCIETY 4
ECTS Credits: 6

School of Languages, Literature, Culture and Communication

Rationale and Purpose of the Module: Consolidation of the structures, functions and vocabulary taught in the first and second years and expands grammatical competence to include complex use of the subjunctive. Further development of knowledge of contemporary Spain and Latin American cultures and societies, with a particular focus on the interaction between Spain, Europe and the wider world.

Syllabus: Tutorials: Working with set textbook, complementary audio-visual material, as well as advanced literary texts.

Prerequisites: SP4243, SP4233

SP4248 - SPANISH LANGUAGE, CULTURE AND SOCIETY 6
ECTS Credits: 6

School of Languages, Literature, Culture and Communication

Rationale and Purpose of the Module: By the end of this module students should:

* have developed further their understanding and command of Spanish grammar, vocabulary and usage.
* have improved their ability to use Spanish fluently and accurately and to make brief
**Rationale and Purpose of the Module:**

**Communication**

School of Languages, Literature, Culture and Communication

**ECTS Credits:** 6

**SP4808 - SPANISH LANGUAGE AND LITERATURE 1**

School of Languages, Literature, Culture and Communication

**Rationale and Purpose of the Module:**

To analyse Latin American literature from the marginalised perspective of two distinct ethnic groups as a way of examining the authenticity and specificity of Latin American peoples and their literature. To broaden and enrich students critical thinking by exposing them to issues closely related to the quest for human rights and freedom of marginal groups in Latin America.

**Syllabus:**

Students will analyse poetry, novels and testimonies by/about black and indigenous populations to include some of the following: Alcides Arguedas (Bolivia), Jorge Icaza and Adalberto Ortiz (Ecuador), Miguel Angel Asturias (Guatemala), José María Arguedas, Enrique López Albujar and Nicomedes Santa Cruz (Peru), Lydia Cabrera and Manuel Cofino (Cuba) among others.

**Prerequisites:** SP4247

**SP4628 - WOMEN’S NARRATIVES OF RESISTANCE IN THE HISPANIC WORLD**

ECTS Credits: 6

School of Languages, Literature, Culture and Communication

**Rationale and Purpose of the Module:**

To develop the students knowledge of different literary modes in 20th-century Hispanic culture. To introduce students to political and testimonial women’s writing in the Hispanic World. To develop the students understanding of different literary and political discourses. To further develop students’ analytical skills, with a special focus on political women’s writing.

**Syllabus:**

Presentations in the language.

- have the ability to identify some of the characteristics of a variety of styles and genres, particularly in the area of media language.

- have a greater awareness of issues in translation and an enhanced ability to translate a variety of text types from Spanish to English and vice versa, particularly in the area of media language.

- have a developing awareness of issues in liaison interpreting and an ability to interpret a variety of text types from Spanish to English and vice versa, particularly in the area of media language.

- understand more about a variety of issues of central importance to Spain and/or Latin America, with particular reference to the media and to other k

**SP4818 - SPANISH LANGUAGE AND LITERATURE 2**

ECTS Credits: 6

School of Languages, Literature, Culture and Communication

**Rationale and Purpose of the Module:**

To develop the students knowledge of different literary modes in 20th-century Hispanic culture. To introduce students to political and testimonial women’s writing in the Hispanic World. To develop the students understanding of different literary and political discourses. To further develop students’ analytical skills, with a special focus on political women’s writing.

**Syllabus:**

The module will concentrate on the exploration of women’s narratives of resistance to power in different textual modes, from testimony to literature, in order to study the different ways in which women have experienced and represented the oppression/repression of dissidence in colonial, neo-colonial and authoritarian regimes in Latin America and Spain.

**Prerequisites:** SP4143

**SP4934 - SPANISH FOR LAW STUDENTS (ADVANCED)**

ECTS Credits: 6

School of Languages, Literature, Culture and Communication

**Rationale and Purpose of the Module:**

Students within the BA in Law and European Studies who take Spanish as their foreign language benefit from a module that gives them an overview of the Spanish legal system and basic legal terminology. This module will help students:

- To consolidate and further develop productive and receptive language skills at an advanced level.
- To facilitate students’ understanding of legal terminology used within the Spanish legal world.
- To develop basic translation skills of legal documentation from Spanish into English: contracts, wills, powers of attorney, etc.

Students will compare the Irish legal system to the Spanish legal system and will acquire certain knowledge of Spanish legal terminology.

**Syllabus:**

- A selection of articles from newspapers, magazines, journals, textbooks and the Internet dealing with topical issues specifically related to the field of law in the Hispanic world will be selected for text analysis and as source material for essay writing.
- A selection of audio and material recorded on DVD will be used for oral and aural skills. A debate class in groups will facilitate integration of all related language skills. A variety of topics relating to issues in legal ethics, i.e. human rights, euthanasia, death penalty and terrorism will be discussed.
- A class will be devoted to practising and improving the students’ command of Spanish concentrating on difficult grammatical areas and the pragmatics of the language.
- Basic translation of legal documentation from Spanish into English.

**Prerequisites:** SP4427
**SS4102 - PSYCHOLOGICAL FOUNDATION OF SPORT AND EXERCISE**

ECTS Credits: 6

Physical Education & Sport Sciences

Rationale and Purpose of the Module: The module aims to introduce key theoretical and applied concepts in sport and exercise psychology. In addition, the module will provide a foundation in the language, methods, interventions and issues in sport and exercise psychology.

Syllabus: Psychology as a discipline and mode of enquiry. Major concepts studied in psychology (e.g. personality, motivation, stress, attention, perception, memory, learning, nervous system). Methodologies employed in psychology. Evolution of sport and exercise psychology. Psychology of physical activity and health. Relevance of psychology to sport coaching, physical education and participation in physical activity. Study of key psychological concepts such as leadership & communication, competition & co-operation, team dynamics. In the contexts of sports coaching, physical education and participation in physical activity. Psychology and motor skills: categories of motor skill and the implications for practice, teaching and coaching; stages of information processing (attention, perception, decision making, action control, feedback) with implications for practice, teaching and coaching; reaction time and the factors affecting it; neuropsychological aspects of performance and learning including proprioception & kinesthesia; stages of learning with implications for practice, teaching & coaching. Memory and its role in the learning and performance of motor skills with implications for teaching. Some key mental skills (e.g. imagery, goal setting, controlled breathing).

**SS4103 - PSYCHOLOGY OF MOVEMENT DEVELOPMENT FROM INFANCY TO ADOLESCENCE**

ECTS Credits: 6

Physical Education & Sport Sciences

Rationale and Purpose of the Module: To advance the students' knowledge and understanding of psychological development from infancy to adolescence from both motor development and psychosocial perspectives

Syllabus: MOTOR SKILL DEVELOPMENT

Motor development as a part of human development; motor development as (a) a process and (b) as a field of study. Descriptions of the phases of motor development from infancy through adolescence to adulthood (reflexive, rudimentary, fundamental skills, sport specific skills) noting the changing characteristics. Factors influencing motor development (growth, maturation, genetics (nature), environment (nurture)); historical overview of theories to explain motor development with focus on the maturation perspective of 1930s and more recent dynamic systems theory; influences of the individual, the environment and task demands. Methods of investigation. Concepts of direction of development, readiness, critical/sensitive periods. Motor development in infancy, childhood and adolescence; early and late developers, implications for teaching and coaching. Importance of a developmental philosophy. Perception and perceptual development with focus on vision. Balance and its development. Evaluation of stimulation and perceptual motor training programmes at various phase of development.

**PSYCHO-SOCIAL DEVELOPMENT**

This module aims to develop a fundamental knowledge and understanding of how developmental issues from childhood to adolescence can influence participation and performance in sport and physical activity. This module will include content relating to youth sport participation and development including models of development in sport, the influence of significant others, stages of development, motivation and participation in sport, and burnout and dropout in sport. This module will compare and contrast readiness for youth sport competition from the biological, social, cognitive and psychological perspectives. The module content will consider psychological considerations of participation in sport and physical education from childhood to adolescence and will critically examine current practices in this area. This module will also critically consider best practices in this area based on research from youth sport and motor development, specifically addressing issues such as long term participation patterns, competition, and program characteristics.

**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.

**SS4204 - SUPPORT SYSTEMS TO MUSCLE CONTRACTION**

ECTS Credits: 6

Physical Education & Sport Sciences

Rationale and Purpose of the Module: The energy requirements of exercising muscle are carefully regulated and supported by fuel and oxygen delivery and the removal of waste products including heat. The purpose of this course is to provide an understanding of the regulation and adaptation of cardiovascular and pulmonary function in response to exercise. An experimental laboratory component provides an opportunity to challenge theoretical concepts by empirical analysis and to competence in measurement techniques.


Prerequisites: SS4202
Rationale and Purpose of the Module: To introduce the students to the area of biomechanics within the discipline of Sport & Exercise Sciences.

Syllabus: Theoretical Content
Revision of basic mechanical concepts but with special reference to sports examples: Forms of motion, linear and angular kinematics and kinetics. Introduction to segmental modelling techniques: cadaver dissection data, water displacement. Construction of generalised link segment models for digitising video. Qualitative analysis - deterministic models. Centre of gravity and radii of gyration. Fluid mechanics and air flow effects with applications to cycling, skiing, and aquatics. Differentiation of video data by finite differences. Integration of force traces by midpoint rule and Simpson’s method. Projectiles: importance of angle, speed and height of release/projection and distance travelled and applications in sport. Analysis of specific sports/activities to include: Walking and running, selected gymnastics skills and diving, throwing and striking skills, jumping and throwing and sprint start.

Practical Content

SS4304 - INTRODUCTION TO BASIC BIOMECHANICS
ECTS Credits: 6

Physical Education & Sport Sciences

Syllabus:

ECTS Credits: 6

Rationale and Purpose of the Module: To provide students with a foundation and 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:


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.

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, it is necessary to know how the human body acts and affects movement. There is a need for the sport scientist and physical education specialist to develop effective skills in qualitative analysis of human movement, how it causes and effects, through a synthesis of knowledge of anatomy and kinetic 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 is placed on the application 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 the development of 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


SS4318 - NOVEL METHODS IN BIOMECHANICS
ECTS Credits: 6

Physical Education & Sport Sciences

Rationale and Purpose of the Module: Aims

* To give students an understanding of new and developing methodologies in the biomechanics of sport and exercise.

* To provide students an understanding of the merits of mathematics for biomechanics research.

Syllabus: Syllabus

* Methods to examine variability in human movement: single subject analysis, considerations of movement variability.


SS4402 - EXERCISE AND HEALTH FITNESS
ECTS Credits: 6

Physical Education & Sport Sciences

Rationale and Purpose of the Module: To provide students with a foundation and understanding of the areas of exercise prescription, physical conditioning and
Syllabus: Exercise Prescription 2: Components of physical fitness. Principles of training specific to all components. Field tests for physical fitness.

Prerequisites: SS4401

SS4405 - SPORTS INJURIES
ECTS Credits: 6

Physical Education & Sport Sciences
Rationale and Purpose of the Module: To develop an understanding of the causes and immediate treatment of sporting injuries, and to take adequate steps to prevent and minimize the incidences and extent of sport injuries.

Syllabus: Syllabus
* The incidence and causes of sports injuries; risk factors and mechanisms of injury.
* Classification of soft tissue injuries, body response to trauma, phases of tissue healing.
* A review of the most common sports injuries.
* Application of first aid principles to injuries, use of RICES in first handling of injuries, E.A.P., procedures for referral to medical/other agencies,

* Goals of sports rehabilitation, components of rehabilitation programme.
* Prevention and rehabilitation of injuries through the application of stretching and strengthening exercises, sports massage and the aquatic environment.
* Overview of the modalities used in the treatment of sports injuries.
* Rehabilitation programmes for specific injuries, functional progressions, guidelines for return to sport.
* The role of medications in the treatment of injuries.
* The role of the sport scientist in the sports medicine team.
* Research in sports injuries.

SS4418 - CLINICAL APPLICATIONS OF EXERCISE
ECTS Credits: 6

Physical Education & Sport Sciences
Rationale and Purpose of the Module: This module is designed to provide students with an appreciation of the techniques and approaches used in designing and applying exercise interventions in specific clinical conditions. The aim is to allow students to apply aspects of physiology and applied exercise science to understanding the treatment / prevention of disease.

Syllabus: The course begins with a structures review of the evidence for benefits of exercise and health. Practical aspects of exercise prescription, including pre-participant screening, components of exercise prescription, outcome measures and progression. The course covers the application of exercise in the following conditions: people with: neuromuscular disorders, with a focus on multiple sclerosis. cardiopulmonary disorders, including COPD and myocardial infarction. vascular disease, with a focus on peripheral arterial disease. osteoporosis. learning disorders, focusing on autistic spectrum disorder. pregnancy.

Prerequisites: SS4202, SS4203

TW4116 - Workplace Issues in Technical and Professional Communication
ECTS Credits: 6

School of Languages, Literature, Culture and Communication

Rationale and Purpose of the Module: To provide students with information on the project management and quality issues in a content development environment, along with practical issues concerning indexing and editing. To give students an introduction to theory and practice of instructional design and e-learning. To give students an opportunity to put their learning into practice through a project which incorporates e-learning and project management. To introduce students to multimedia tools used in content development.

Syllabus: This module has two strands: documentation management and instructional design. The documentation management strand covers: managing complex documentation projects, tools for
project management, quality, developing a style guide, editing and indexing, the review process. The instructional design strand covers: learning theories, needs assessment, audience analysis, objective analysis, media specifications, course design, performance assessment, and delivery systems.

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(s); 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(s); Business Relief; Agricultural Relief; Taxation of Trusts; Foreign Aspects; Stamp Duty.

TX4407 - CORPORATE TAXATION
ECTS Credits: 6

Accounting & Finance

Rationale and Purpose of the Module: This module aims to provide a detailed understanding of the principles underpinning the computation of the liabilities of companies to Corporation Tax, VAT and Capital Gains Tax. To compute corporate tax liabilities, including the utilisation of available reliefs such as Research and Development and relief for losses. To understand Close Company legislation and related liabilities. To understand the residency rules for corporates, including relevant international tax planning. To understand the tax implications of business incorporation and related planning.


Prerequisites: TX4305

WT4005 - ARCHITECTURAL TECHNOLOGY: HERITAGE AND DESIGN
ECTS Credits: 6

Design and Manufacturing Technology

Rationale and Purpose of the Module: To develop: A critical aesthetic awareness of the design of buildings and their relationship with their surroundings. The ability to make informed judgments on aesthetic and other considerations relating to buildings and the built environment. An appropriate vocabulary to discuss issues relating to craft standards, visual impact of buildings, sustainability and environmental considerations and the best use of space. The ability to make value judgments on general best practice relating to buildings and the built environment.


Architectural Heritage & Appreciation at second level. Designing, planning and managing appropriate teaching and learning activities for Architectural Heritage & Appreciation.

WT4014 - INTRODUCTION TO GEOLOGY AND SOIL MECHANICS
ECTS Credits: 6

Civil Engineering and Materials Science

Rationale and Purpose of the Module: This module introduces the most common material encountered in the construction industry by exploring soil mechanics beginning with the fundamentals in civil engineering geology. The course is designed to challenge the student to seek the key concepts in geology and soil mechanics apply these concepts in projects and self-directed learning to achieve the following key objectives:

To provide a clear understanding of the role of geology and soil mechanics in achieving a successful construction project.
To form the basis for subsequent modules on Soil Mechanics and Geotechnical Engineering Design.
To generate enthusiasm for the subject through field trips, practical experimentation and case histories.

Syllabus: PART I The Earth and its formation; plate tectonics; physical and chemical processes; erosion and deposition; Quaternary geology; Rock types; igneous, sedimentary, metamorphic; geological maps and terminology; role of geology in civil engineering.

PART II Setting the context using the soil mechanics triangle; soil composition and chemistry & clay bonding and double layer; classification and identification; phase relationships; soil compaction and improvement techniques; effective stress concept and flow of water in soils; permeability and flow nets; drained and undrained shear strength; site investigation.

WT4016 - WOOD TECHNOLOGY AND DESIGN 2
ECTS Credits: 6

Design and Manufacturing Technology

Rationale and Purpose of the Module: This module will provide students with the opportunity to develop and
WT4018 - ADVANCED TIMBER CONSTRUCTION  
ECTS Credits: 6  
Civil Engineering and Materials Science  
Rationale and Purpose of the Module: The aims of this module are  
* that the student gains an insight into the use of wood in modern building design  
* that the student develops a confidence and ability to defend, develop and promote the use of wood in competition with other building materials and systems  
The objectives of this module are  
* to introduce the context of current building practice in the use of wood and wood based components  
* to integrate new ideas and innovations in the use of wood in construction in a global context  
* to equip the student with the terminology and concepts involved in analysis and design of wood based constructions  
* to introduce the concept of end use of construction, particularly for humans using timber based constructions  

WT4017 - ENERGY EFFICIENT BUILDINGS  
ECTS Credits: 6  
Civil Engineering and Materials Science  
Rationale and Purpose of the Module: To introduce students to the microstructure and macrostructure of wood and wood products. 

To understand the basic failure modes of wood and wood products.
WT4203 - FURNITURE DESIGN
ECTS Credits: 6

Civil Engineering and Materials Science

Rationale and Purpose of the Module: To give the student: an appreciation of product design development and progress in a historical context, and an understanding of the underlying principles which influence contemporary furniture design.

Syllabus: Design and problem solving skills Timbers/materials predominantly used in furniture manufacture
Mechanics of design/forces in relation to furniture design
The golden ratio and the importance of proportion
Graphical communication skills
Manufacturing process/techniques
Classical orders of architecture
Mechanics of design/forces in relation to furniture design
Memphis case studies

WT4208 - BUILDING SERVICES 2
ECTS Credits: 6

Civil Engineering and Materials Science

Rationale and Purpose of the Module: The aim of this module is to provide a comprehensive introduction to the more complex building services and equipment being adopted in modern non domestic buildings. It is also an aim to introduce the student to key elements of services design for buildings. This module builds on the learning of WT4504

* Introduction to building services in non domestic construction including both active and passive services.
* Understand design, build and operation implications of these services.
* Have good knowledge of water installations to multi storey buildings
* Understand the essentials of electrical and gas distribution and supply
* Identify the principle fire fighting equipment needs for modern buildings
* Understand the principles of providing appropriate lighting within buildings

Syllabus: * Heating and air-conditioning services: energy performance measurements using, SBEM and...
NEAP; heating and air conditioning, temperature drop through structures; gas supply and distribution, gas controls, ventilation ducts and fans, solar heating, heat pumps and bio-mass.

- Hot and cold water services: Pipe sizing for hot and cold water in multi-storey buildings, force and pressure, hydraulics.
- Drainage services: sustainable urban drainage, retention tanks, oil separation, green roof, grey water recycling
- Electrical services: electrical terms and installations, supply and distribution of electricity, supply controls, protection, conductor and cable rating, methods of wiring and distribution systems, single phase power circuits; electrical installations in large buildings; site electricity, electric space heating
- Access services: lifts, escalators and service ducts, automatic control.
- Lighting services: integration with electric light, natural lighting, artificial lighting, design of lighting, lighting controls
- Safety services: classification of fire risks, safety devices, heating and flues; sprinklers, risers and hose reel installations, dry and wet risers; portable and fixed extinguishers, automatic fire detectors, alarms and dampers, pressurisation of escape routes, automatic fire ventilation fire detection, security systems.
- Electrical services: supply to non domestic buildings micro generation (solar and wind)
- Data services; audio visual, broadband and telephony.

Prerequisites: WT4504

WT4302 - WOOD TECHNOLOGY 2
ECTS Credits: 6

Design and Manufacturing Technology

Rationale and Purpose of the Module: To provide students with the opportunity to become successful, competent teachers of technology subjects at second level; including Materials Technology (Wood), Technology and Technical Graphics to higher level Junior Certificate and Architectural Technology, Technology and Design & Communication Graphics to higher level Leaving Certificate. This module will focus on decorative wood working techniques through an applied design approach.


WT4304 - MACHINING TECHNOLOGY 2
ECTS Credits: 6

Civil Engineering and Materials Science

Rationale and Purpose of the Module: To introduce students to machine safety, set up, operation and maintenance. To enable the students to select safe and appropriate manufacturing strategies and optimise machine production for a range of product assemblies.

Syllabus: Machine safety
Ppe & dust, eye, and noise protection
Machine electricity and safety
Health and safety management
Spindle moulder
Planer moulder
Circular sawing and planning machines
CAD/CAM programming
Computer integrated manufacture
Maintenance of machines setting of planer knives etc
Machine selection/specification
Machine tooling

Prerequisites: WT4303

WT4502 - CONSTRUCTION TECHNOLOGY
ECTS Credits: 6

Civil Engineering and Materials Science

Rationale and Purpose of the Module: This module builds on the material covered in WT4401 through applied practical coursework based on residential construction practice. The course emphasises best industry practice and is framed around the relevant legislative instruments governing residential construction in Ireland.

Syllabus: Site selection and analysis for residential construction û addressing engineering, planning and Irish architectural heritage and conservation.
- Soil identification, properties and behaviour û factors affecting drainage & foundation choice.
- Concrete technology and mix design.
- Environmental considerations in residential construction û sustainable technologies for waste disposal and energy.
- Introduction to housing estate development and planning applications.
- Interpretation of construction drawings.
- Trouble shooting residential building problems via case histories.

Prerequisites: WT4401

WT4504 - BUILDING SERVICES 1
ECTS Credits: 6
WT4604 - LAND SURVEYING  
ECTS Credits: 6  
Civil Engineering and Materials Science  
Rationale and Purpose of the Module: The aim of this module is to provide an understanding of principles of land surveying and the use of specialist surveying equipment. The principles and techniques of surveying are applied to a wide variety of realistic construction project applications.  
The specific objectives are to provide:  
* An understanding of surveying fundamental principles and use of surveying instruments  
* Knowledge of the application of these to conduct land and site surveys  
* Practical experience in using these modern instruments in the solving of a variety of site problem situations.  
Syllabus: Surveying fundamentals, tape & offset surveying; levelling, the theodolite and its use, tension determination, steel tapeing differential levelling, traversing, angle measurement electromagnetic distance measurement, satellite positioning systems, survey methods, analysis & adjustment of measurements, areas & volumes, setting out, curve ranging, topographic surveying, construction control surveys, geographic information systems, global positioning systems, construction applications, field coding, automatic target recognition, typical field operations. Practical case studies and fieldwork.  

WT4704 - BUILDING MEASUREMENT  
ECTS Credits: 6  
Civil Engineering and Materials Science  
Rationale and Purpose of the Module: The overall aim of this module is to illustrate measurement techniques and procedures for buildings and associated works.  
Syllabus: Setting down dimensions, alternative systems, applied mensuration, general rules for taking-off; measuring substructures, excavations, formwork areas, various foundation types and measurement; walls, floors, concrete, blockwork, masonry, partitions and suspended ceilings; internal surface finishes, dry linings roofs, structural elements, roof finishes and coverings, waterproofing; internal finishes, windows, doors, staircases, fixtures and fittings; reinforced concrete structures, columns, beams, slabs, formwork, concrete finishes, reinforcements; structural steelwork; structural timber, standard joinery components; plumbing, fittings, mechanical and electrical installations; drainage, underground and above ground, external works, roads, pavings, earthworks and groundworks, landscaping; demolitions, alterations and renovations.  

WT4804 - ESTIMATING AND COSTING  
ECTS Credits: 6  
Civil Engineering and Materials Science  
Rationale and Purpose of the Module: The overall aim of this module is to introduce some standard estimating and costing techniques that apply to building construction works.  
The key objectives are to  
* Describe the role of the estimator in the tendering process  
* Illustrate standard estimating techniques and the process for preparing a cost estimate for building works  

WT4902 - MODEL MAKING  
ECTS Credits: 6  
Design and Manufacturing Technology  
Rationale and Purpose of the Module: To introduce the student to skill and techniques that will enable them to make realistic models that will enhance their design presentation. To explore the use of a variety of materials and methods with particular emphasis on the safe use of wood and metal working machinery and both power operated and manual hand tools.  
Syllabus: An introduction to Health and Safety in the workshop  
An introduction to machines, equipment and tools for cutting, shaping, joining and finishing.  
Model making techniques using wood, plastics, metals and plaster of Paris, involving mould making for vacuum forming and plaster casting.  
Analysis of shapes and graphic presentation relative to material and process selection for designing the model.  

WT4904 - DESIGN FOR TEACHERS  
ECTS Credits: 6  
Design and Manufacturing Technology  
Rationale and Purpose of the Module: This module will apply fundamental design principles and skills to develop a strategic approach to teaching through design based activities in technology subjects at Junior Cycle level.
**WT4968 - SAFETY IN TECHNOLOGY CLASSROOMS: LEGISLATION & PRACTICE 2**

ECTS Credits: 3

**Design and Manufacturing Technology**

**Rationale and Purpose of the Module:** To develop the knowledge, skills, values and attitudes necessary to ensure the appropriate management of safety by the teacher in the technology teaching environment at second level. A deeper understanding of the statutory instruments and other regulations that apply to the management health and safety in the technology teaching environment at second level. An ability to execute the procedures associated with the creation and maintenance of a safe and healthy learning environment.

Contact Study.Abroad@ul.ie with any module queries

More information is available at www.ul.ie