**Introduction**

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

Normal course load is 5 modules per semester.

**Module Key**

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

Example CU4051

CU is the subject area

4 is the type of study – only modules beginning in 4 are offered to study abroad students.

5 and 6 are postgraduate modules and modules beginning in 2 are certificate courses/access courses.

05 is just the departments way to distinguish between classes

The final digit is the only way to determine which semester it will run in.

1, 3, 5, 7 are fall semester classes

2, 4, 6, 8 are spring semester classes

1 and 2 are first year classes

3 and 4 are second year classes

5 and 6 are third year classes

7 and 8 are fourth year classes.

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

**Modules featured in this Booklet**

All modules are in alphabetical order by module code.

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*Only open to Journalism Majors

**Faculty Key**

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

**Disclaimer**

The content of this booklet are for information purposes only and should not be viewed as the basis of a contract between student and the University. No guarantee is given that modules may not be altered, cancelled or otherwise amended at any time.
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 assertions 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. 2. Acquire an overview of ethical theories and their potential for engagement with business. 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:** 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 project topics, which are 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
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 scales, modes of operation and reference points. The emphasis will be on the mastery of investigative skills through a range of media on an ongoing basis.

Prerequisites: AR4005

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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/experiential 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.

Prerequisites: AR4011

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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. Topics will be portal frames, crane structure; 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

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:

Syllabus: 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:
- Surveying using the sketchbook, pencil and the body to observe and record buildings, proportions, scale, and distances of objects.
- Surveying using careful notation of dimensions through careful observation, and detailed measuring using a tape measure and triangulation.
- Drawing, with pencil, the results of the survey carefully bringing all information to the same level of detail and consistency on a well-organised composed drawn document.

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: The theme for the spring workshop is Building. 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 Vitri 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

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.

Prerequisites: AR4032

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.

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’s 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 its different forms and sources towards materials and their properties. Parallel and interconnected to the teaching of design basics like space, light, boundaries students will learn the physical backgrounds and properties by handling and personal experiences. Suddenly, your finger at a hot stainless steel surface while missing the heat radiation and understand why this happened is a much deeper experience, than just calculating heat conductivity on a piece of paper.

Prerequisites: AR4051

AR4052 - ENVIRONMENTAL SYSTEMS AND FORCES 2
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

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 parts-based 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

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 architectural creation. 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.

**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 metascience 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.

**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*


**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.


**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

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.

Prerequisites: BC4903

BY4001 - 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.

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.

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 -level teachers of biology, the necessary skill and knowledge to able to
Life Sciences

ECTS Credits: 6

BY4204 - PRINCIPLES OF HUMAN PHYSIOLOGY
ECTS Credits: 6

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.

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.

Prerequisites: BY4002, BY4006

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. Foods 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

BY4105 - 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.

Prerequisites: BY4001, BY4002, CH4102

BY4405 - 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.

Develop research methods and resources.

150g load, Design, develop and construct small structure to carry elastic modulus / bending stress; Introduction to relationship between bending moment / introduction to structural dynamics / resonance; Member forces in pin jointed trusses; and uniform loads, for simply supported and fixed supports; Bending moment and shear force diagrams under point loads through structures under 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 Techniques, 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.

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.

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.


CE4005 - STRUCTURAL THEORY
ECTS Credits: 6

Civil Engineering and Materials Science

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

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

Prerequisites: CE4003

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 & 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 & 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

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.


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.

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:

**Syllabus:** Dwelling Energy Assessment Procedure DEAP
Heat: Introduction to energy, thermal insulation, heat loss calculations, principles of air conditioning.
Lighting: sources, efficiency and control.
Ventilation: ventilation, air filters, heat recovery systems.
Hot Water: Hot water supply, low, medium and high pressure hot water heating, district heating.
Noise: managing noise.

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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.
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 non-von Neumann architectures.

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

Prerequisites: CE4517

CE4702 - COMPUTER SOFTWARE 2
ECTS Credits: 6
Electronics & Computer Engineering

Rationale and Purpose of the Module: Further the students knowledge of a modern object oriented programming language with particular emphasis on classes, objects and Graphical User Interfaces.
Understand the concepts of inheritance and polymorphism.
Develop the ability to produce moderately complex event driven programs with user interfaces developed using a graphical toolbox.

Syllabus: The following topics will be covered:
In depth study of the object oriented principles, inheritance and polymorphism.
Abstract data types including interfaces, abstract classes.
Input and output including files and streams.
Introduction to the use of regular expressions to manipulate text files
Introduction to algorithms - efficiency, simple analysis and comparison
Error handling techniques
Binary trees
Recursion
Graphical user interfaces and development of event driven applications
Unique global class naming and creation of class libraries
Code documentation and code reviews
Use case analysis

Prerequisites: CE4701

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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.
Programming Languages Programming Practice: Coding, Style, Documentation

Prerequisites: CE4706

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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.

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 Arhenius 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's and Henry's 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 students' 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: Lindlar catalyst and dissolving metal reduction; hydride reducing reagents, Reformatsky reaction; use of protecting groups. Stereochemical control: asymmetric induction, diastereomeric selectivity, Felkin-Anh model; enantioselective reactivity, 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 Hammet 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, Dihydr0xylation, Mannich reaction, Reductive Amination, Birch Reduction, Michael Addition, Allylic bromination, Sharpless Epoxidation, Mitsunobu Reaction, Suzuki Coupling, Heck Reaction, Benzoye chemistry.
Prerequisites: CH4008

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 rates 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: CH4701

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.

&bull; To acquaint the student with synthetic methods for formation of nanostructures and new physical properties that arise.
&bull; 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 1-10 nm 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: CH4102

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 such as amino acids, peptides and carbohydrates; 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.

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

CH4152 - INTRODUCTORY ORGANIC CHEMISTRY 1B
ECTS Credits: 6

Chemical & Environmental Sciences

Rationale and Purpose of the Module: To introduce the student to fundamental aspects of organic chemistry eg families of compounds (aliphatic and aromatic), functional groups and associated chemical behaviour, nomenclature, structure (2D and 3D), isomerisation; To carry out practical work to support and reinforce some of the theoretical aspects encountered; To encourage self-directed learning through the use of software and other means.

Syllabus: Syllabus: Functional Group Chemistry & Aromatic Chemistry


Amines/Cycloalkanes: Nomenclature; Structural formulae; Isomerisation: Structural and Geometric; Electrophilic Addition Rxns., Carcocations; Markovnikov Addition; Polymerisation; Occurrence and Uses. Current trends.

Alkynes: Nomenclature; Structural formulae; Structural Isomerisation; Acidity; Electrophilic Addition Rxns., Occurrence and Uses.

Haloalkanes: Structural formulae; Nomenclature; Substitution Reaction Mechanisms SN1, SN2 (Elimination Rxns covered in CH4153).

Aromatic Hydrocarbons: Benzene and Benzenoid Compounds.

Aromaticity- Huckel Rule; Aromatic, Anti-aromatic and Non-aromatic Compounds; Benzene and Benzene derivatives: Structural Formulae; Nomenclature, Electrophilic Aromatic Substitution Rxns; Occurrence and Uses (ctd extensively in CH4153).

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

Ethers: Structural formulae; Nomenclature; Properties and Uses.

Aldehydes and Ketones: Structure & Basicity of the Carbonyl Group; Nomenclature; Properties; Preparation; Nucleophilic Addition Reactions; Identification Tests. (ctd extensively in CH4153).

Carboxylic Acids and Carboxylic Acid Derivatives (ctd extensively in CH 4153).

Overview- Functional group; Nomenclature; Properties; Some reactions. Occurrence/Uses.

Amines: Overview- Functional group; Nomenclature; Some reactions; Occurrence and Uses (covered extensively in CH4153).

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, particularly ionic solids.


Prerequisites: CH4701

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

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. Counter-current 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: Review of some basic principals; Relaxation Processes; Homotopic, 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 1H NMR: 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.

Syllabus: SYLLABUS
- SPECTROSCOPIC METHODS:
  - AES 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:
  - POTENSIOMETRIC (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

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.

CH4901 - 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

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.

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.
CS4006 - INTELLIGENT SYSTEMS  
ECTS Credits: 6

Computer Science & Information Systems

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

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

CS4012 - REPRESENTATION AND MODELLING  
ECTS Credits: 6

Computer Science & Information Systems

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

Syllabus: What is a representation? the represented world, the representing world and the mapping between the represented and representing world; intrinsic versus extrinsic mappings; Representing information in various forms of media (images, graphics, video, audio and text); characteristics of multimedia data; hypertext and hypermedia; document content and structure; content model; semantic structure; metadata and metatags; modelling media objects; modelling correlations among media objects; simulation versus animation;

What is a model? model criteria: mapping criterion, reduction criterion, pragmatic criterion; models versus real systems; abstraction and similarity; iconic, analogic and symbolic models; static and dynamic models; descriptive and prescriptive models; metaphor as a special type of model; purposes of models; Analyzing social, biological and business phenomena, in order to design and construct models of those phenomena, using spreadsheets and databases;

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

Prerequisites: CS4411

CS4014 - SOFTWARE DEVELOPMENT PROJECT  
ECTS Credits: 6

Computer Science & Information Systems

Rationale and Purpose of the Module: This module is intended to provide the student with an opportunity to undertake a semester long software development project. A student will gain experience of working in a team and the confidence to tackle a large software system.

Syllabus: A substantial semester-long software 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 the existing modelling, design and programming skills required to achieve the proposed system.

Prerequisites: CS4016

CS4016 - DIRECTED STUDY FOR MMPT 3  
ECTS Credits: 6

Computer Science & Information Systems

Rationale and Purpose of the Module: The development of research skills.

Syllabus: In this module the knowledge is structured in the form of small group tutorials. The research themes include: Natural, Stochastic & Algorithmic Processes in music and video (e.g. the music of Cage, Xenakis and Martiriano, Generative and Algorithmic Video, Fractals, Visualiser algorithms and software, Algorithmic animation) and Interactivity in Digital Art - Gesture & Haptics (e.g. NIME, Stein, MediaLab) and Distributed Systems (e.g. The Hub, Ircam, Brain Opera).

Prerequisites: CS4024

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

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: 1. 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-marketing and e-advertising concepts; e-marketing communications; e-business payment systems; e-advertising charge models; e-advertisement types; affiliate marketing, e-customer relationship management (E-CRM); Social, legal and ethical issues in e-business; Network Security: Security threats: malicious code, web application attacks, cyber vandalism, spoofing, denial of service attacks Security solutions: encryption, digital signatures, digital certificates, firewalls, proxies Wireless Technology and M-Business: location-identification technologies; wireless marketing; wireless payment options; privacy and the wireless internet;

Prerequisites: CS4135

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: 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

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

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: CS4012, CS4512

CS4065 - WEB INFRASTRUCTURE
ECTS Credits: 6

Computer Science & Information Systems

Rationale and Purpose of the Module: This module will encourage students to develop standards-compliant web applications. Students will learn how different capabilities can be provided by competing technologies. A substantial web development project will be undertaken by students - the nature of the application domain of this undertaking will depend on the students chosen programme of study.

Syllabus: Categories and characteristics of web applications;
- Similarities and differences between the development of traditional, not web-based applications and the development of web applications;
- Modelling web applications: content, hypertext, presentation and customization modelling;
- Modelling methods such as OOWS model driven approach, OOHDM, UML, IDM approach, WebML, WebRATIO, HERA, WSDM, MDA;
- Web application architecture: categorizing architectures, layered architectures, data-aspect architectures;
- Web application design: information design and software design; presentation, interaction and functional design;
- Technologies for web applications: hypertext and hypermedia; client/server communication; client-side technologies; document-specific technologies; server-side technologies; current concepts, methods, techniques and tools;
- Security for web applications: encryption, digital signatures and certificates; secure client/server interaction; client security issues; service provider security issues;
- Semantic web: roles of software agents, semantic markup and ontologies; semantic web applications; semantic web services;

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 bitmapped 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
**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.

**Syllabus:**
- Advanced mixing techniques.
- Principles of audio reinforcement systems.
- Surround sound mixing, time code and synchronization.
- Digital video non-linear editing system.
- Advanced video editing techniques.
- Compositing and effects.
- Visual treatments.
- Finishing and disc authoring.

**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 processes; 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:**
- 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.

**CS4082 - INTRODUCTION TO WEB DEVELOPMENT**
ECTS Credits: 6

**Computer Science & Information Systems**

**Rationale and Purpose of the Module:** This module will introduce students to the concepts and techniques underlying the World Wide Web, such that they will gain a working knowledge of how to structure and build websites. Students will be introduced to databases and SQL in order to create dynamic, data-driven web applications. Examples and project work will be relevant to each group of students in so far as possible.

**Syllabus:** Introduction to the world wide web: web browsers, web servers and clients, uniform resource locators, the hyperertext 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), hyperertext and hypermedia.
- Hypertext MarkUp Language (HTML); standard HTML document structure, HTML syntax, tags, text formatting, colours, images, hyperertext 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.

**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: 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.

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

CS4112 - COMPUTER SCIENCE 2

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.


- Review of difference between variables in mathematics, and in imperative Programming Languages. Constructing mathematical/assumptions 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.

CS4115 - DATA STRUCTURES AND ALGORITHMS

ECTS Credits: 6

Computer Science & Information Systems

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

Syllabus: - Mathematics Review;

- Review of the ADTs, internals and usage of simple data structures and associated algorithms, in particular recursive algorithms;

- Linked Lists and Networks;

- Recursion, and the elimination of recursion from algorithms;

- Study of sorting algorithms: quicksort, heapsort, mergesort and bucket and radix sorting;

- Analysis of general divide-and-conquer algorithms;

- Searching: tree searching, AVL trees, splay trees;

- Graph algorithms: graph traversal and spanning forests, depth and breadth first search of graphs; connectivity; minimal spanning trees for weighted graphs; shortest path algorithms; networks;

CS4125 - SYSTEMS ANALYSIS AND DESIGN
ECTS Credits: 6

Computer Science & Information Systems

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

Syllabus: - Software lifecycles: review of the waterfall model, prototyping, spiral, and object-oriented (OO) development models.

- Focus on the Unified Software Development Process (USDP).

- Characteristics of good software design - modules, cohesion, coupling or dependency, encapsulation, abstraction, etc.

- Requirements investigation.

- Requirements classification: functional and non-functional requirements.

- Requirements modelling: use case diagrams and use
Computer Science & Information Systems

CS4148 - HEALTH INFORMATICS PROJECT 2
ECTS Credits: 12

Computer Science & Information Systems

Rationale and Purpose of the Module: The rationale for this module, and the preceding module (CS4148) to which it is bound, is to allow students, through the medium of undertaking a substantial individual project, to integrate and apply their previous learning and to deepen their knowledge of some particular application or research area relevant to the course. A secondary objective is to allow students to exercise, and hone, their writing and presentation skills by requiring them to write a substantial report documenting the project and to produce number of presentations describing the project to their supervisors, the general public, and their peers.

Syllabus: The project takes two semesters and includes such activities as literature review, field-work, modelling, design, programming, testing, and evaluation and report writing. Seminars/Lectures will be held on the following topics: research methods, project planning, report planning, formal and informal presentation techniques and report writing.

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.

**CS4211 - COMPUTER ORGANISATION 1**
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.

**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 to 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.


- 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.

**CS4556 - 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

**Prerequisites:** CS4556

**CS4815 - COMPUTER GRAPHICS**

ECTS Credits: 6

**Computer Science & Information Systems**

**Rationale and Purpose of the Module:** Given the role of graphical user interfaces in the computing devices today this programme should include at least one module relating to computer graphics.

**SYLLABUS:** Physical devices for graphics systems: Input and Output devices, Raster Scan devices, RGB colour systems, Video Memory Models; Implications of these for interactive graphics systems.

General structure of Interactive Graphics systems: Issues involved in digitising analogue information: antialiasing techniques; Design and implementation of drawing algorithms for basic shapes: Issues and techniques; Establishing Device, Language and Application Independence: Conceptual levels in graphics systems; Frames of reference and Viewing systems;

Control and manipulation of graphics elements: Input and Output primitives, Clipping functions, Transformation (rotation, scaling, translation, reflection, shears) and Segmentation functions; Transformations in 3-D; Projections; Viewing in 3D; Drawing Curves: Techniques, Properties of different types of curves;

Basic Modelling: Representation of surfaces via polygons; Realism; Hidden surface removal; Surface generation via bi-cubic curves; Rendering.

**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".

**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:**
- - 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.

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**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.

**Syllabus:**
- Business Information Technology/Systems: Brief Historical Perspective; Review of Terminology; Taxonomy of Information Systems.
- 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.

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**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) – 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) – 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) – students will carry out a project in the area of New Media discourse analysis.

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**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 a European perspective on the film industry.

**Syllabus:**

- To this end the module will examine the techniques of 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

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**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 McGuckian, 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 McGuckian. The course will consider matters such as the poets relationship to the nation and to the State; and will also explore the significance of landscape, memory, myth and gender in the corpus of twentieth-century and contemporary Irish poetry in English.

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

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 currents and trends in European cinema. To develop students’ knowledge and exposure to film studies and enhance their ability to analyse and critique films.

Syllabus: This module will involve 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.

CU4128 - NEW MEDIA, LANGUAGE AND GLOBALISATION
ECTS Credits: 6

School of Languages, Literature, Culture and Communication

Rationale and Purpose of the Module: To deepen students’ understanding of the interaction between language and technology, economics and politics in New Media; To explore the linguistic and sociolinguistic characteristics and consequences of New Media practices, To analyse these practices and their consequences at both micro and macro levels; To develop students’ critical skills.

Syllabus: This module focuses on the interaction between language, technology, economics and politics in the New Media. New media are understood here as media that are designed beyond the context of the nation state. The focus will be on satellite and digital broadcasting as well as on the Internet, although reference will be made to other media, both traditional and new. The module will cover the following areas using a number of case studies against a theoretical background: The language and cultural politics of New Media (how global media organizations respond to linguistic diversity; technical possibilities versus political/economic realities); the role of English as the globalizing language of New Media and the social, cultural and linguistic consequences of this; minority languages and New Media (the focus here will be on the Irish language and New Media).

EC4004 - ECONOMICS FOR BUSINESS
ECTS Credits: 6

Economics
Rationale and Purpose of the Module: The purpose of this module is to provide the student with an understanding of intermediate level micro- and macroeconomic 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. The second six weeks of the module 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 microeconomic 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 (MT Chapter 6, 13; LW Chapter 21, 22) and labor mobility, as well as concentrating on how economics and politics interact to understand the existence, or absence, of certain policies at an international level.

EC4014 - INTERNATIONAL ECONOMICS
ECTS Credits: 6

Economics

Rationale and Purpose of the Module: The world economy is becoming increasingly integrated and interdependent in terms of the economies of linking countries and regions. Three ways in which countries are linked are through the exchange of goods and services (trade), investment flows (capital mobility) and migration (labour mobility). This module builds on introductory micro and macroeconomic principles in order to provide students with the tools of analysis necessary to examine the international economy and to explore the key issues that are shaping our global economy. The emphasis is on current issues in international economics. In this module we examine why international trade and factor mobility, as well as concentrating on how economics and politics interact to understand the existence, or absence, of certain policies at an international level.

Syllabus: The module is divided into six sections set out below. Each topic will have a corresponding problem sheet which students should work through as an aid to understanding the material presented in lectures. Further detailed references and readings for each topic, where relevant, will be given in lectures.

Section I Introduction and Context

Topic 1 Introduction and Context

Section II International Trade Theory

Topic 2 Comparative Advantage

Topic 3 The Standard Trade Model

Topic 4 The Heckscher-Ohlin Trade Model

Section III International Trade Policy

Topic 5 Tariffs

Topic 6 Nontariff Trade Barriers
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

ECTS Credits: 6

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
2. Money and Banking
3. Money and Interest Rates in a Closed Economy
4. The IS-LM Model
5. The Phillips Curve and the Inflation-Unemployment Trade-off
6. The Mundell-Fleming Model
7. European Monetary Union and the European Central Bank
8. A Dynamic Monetary Model of Aggregate Demand and Aggregate Supply
9. Savings, Investment and the Balance of Payments
10. The Economic Crash of 2008 and Its Aftermath

Prerequisites: EC4102, EC4004

ECTS Credits: 6

EC4024 - FINANCIAL ECONOMICS
**Economics**

**Rationale and Purpose of the Module:** Finance is the applied wing of economics. This course is about introducing students to the economics of finance via the study of several canonical models.

**Syllabus:** We will begin with data. First, we’ll describe the categories within which financially important variables exist, and develop ways to encapsulate them using simple statistics drawn from the study of simple probability distributions. We will develop graphical tools to analyse market movements in the lectures. Then we will move on to the study of financial history, to show the influence of uncertainty and ‘Black Swans’ on the markets, and to help you understand just how little we as economists really know about the markets and how they move. We will develop three simple but flawed models used to benchmark markets to round out the course, which every person interested in finance must know, as these models begin many of the conversations one might have about a stock or a bond. Then we will pull these models apart, so students will know more than one might have about a stock or a bond. The purpose of this course 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) interact and how the policy-maker (Government and Central Bank) can influence their behaviour. Following an introduction to the key macroeconomic variables and globalization, a model of how the macroeconomy operates (the theory of income determination) is developed. This model is then expanded at various stages to include the money market and the foreign exchange market. The expanded model is used to discuss issues in macroeconomic theory and policy such as role and operations of the European Central Bank (ECB) and the relative importance of fiscal, monetary and exchange rate policies. The course concludes by discussing recent trends and economic issues relating to the Irish economy.

**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.

Topic 13. The Long-Run Performance of the Irish economy

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.

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**EC4102 - MACROECONOMICS**

**ECTS Credits:** 6

**Economics**

**Rationale and Purpose of the Module:** The purpose of this course 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) interact and how the policy-maker (Government and Central Bank) can influence their behaviour. Following an introduction to the key macroeconomic variables and globalization, a model of how the macroeconomy operates (the theory of income determination) is developed. This model is then expanded at various stages to include the money market and the foreign exchange market. The expanded model is used to discuss issues in macroeconomic theory and policy such as role and operations of the European Central Bank (ECB) and the relative importance of fiscal, monetary and exchange rate policies. The course concludes by discussing recent trends and economic issues relating to the Irish economy.

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**EC4108 - CONTEMPORARY ISSUES IN THE GLOBAL ECONOMY**

**ECTS Credits:** 6

**Economics**

**Rationale and Purpose of the Module:** An understanding of the main issues confronting the international economy is a pre-requisite to finding solutions to global problems. The recent financial and banking crisis and the attendant severe budgetary and fiscal problems facing many countries (especially Ireland and the peripheral EU countries) has led to some significant reappraisal of what had become mainstream thinking in relation to economic policy and indeed in some circles market capitalism. Increasingly, much debate in the international economy is polarised between two camps: those who see globalisation as the panacea for solving economic and social problems and the anti-
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 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 less 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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**ECTS Credits: 6**

**Economics**

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

**Syllabus:** The question of what is economics is explored. In answering this question emphasis is placed on the importance of key concepts such as scarcity, individual decision-making, trade-offs and opportunity cost. Students are also introduced to the distinctions between microeconomics vs macroeconomics and normative vs positive economics. Markets as a means of organising economic activity are examined. The model of supply and demand is used to understand how market equilibrium prices and quantities are determined. You not only learn how equilibrium is determined, but how relative prices are used by consumers and suppliers to make decisions about the use of society's scarce resources. Supply and demand curves are used to explain the movements of prices and the allocation of resources in a market economy such as ours. Government intervention in the market via the introduction of price ceilings (maximum price) and price floors (minimum price) are also examined. The sensitivity of demand and supply to changes in key variables such as price and income is analysed through measures of elasticity.

Individual decisions are looked at in detail to show how they come together to form the demand curve. Consumer choice using indifference curve analysis is introduced. Shifting the focus back to the market process the latter part of the module focuses its attention on supply and costs of production. Students examine the different types of costs and how costs affect revenue and profits. Cost concepts and how they relate to a perfectly competitive firms supply decision are examined. At the other end of the competitive spectrum is the complete absence of market competition. This situation of monopoly (single priced vs price discrimination monopolists) is also studied in detail.

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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, Okun's 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. 6. The Price Level and Money Supply and the quantity theory of money and implications. 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...
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, stabilisation, and re-distributive roles of government. This involves analysis of theory and practice in relation to taxation and expenditure decisions.

Syllabus: 1. Pareto Optimality, General Equilibrium, Social Welfare Functions,
3. Cost Benefit Analysis,
4. Taxation: Incidence and Partial Equilibrium, Taxes on Labour, Taxation and the incentive to work.
6. Economics of Regulation.

Prerequisites: EC4101, EC4102, EC4004

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
Gyroscopic Instruments, mechanical gyros, gimballed 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.
Rationale and Purpose of the Module:

Electronics & Computer Engineering

ECTS Credits: 6

EE4014

MIL STD 1553, ARINC 429, A629

Digital Data Busses used on Aircraft Control.

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

EE4012 - CIRCUIT ANALYSIS 1
ECTS Credits: 6

Electronics & Computer Engineering

EE4013 - COMPUTER NETWORKS
ECTS Credits: 6

Electronics & Computer Engineering

EE4014 - ELECTRICAL ENERGY
ECTS Credits: 6

Electronics & Computer Engineering

EE4018 - ENGINEERING MANAGEMENT
ECTS Credits: 6

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.

Introduction to economic, managerial, behavioural and social responsibility theories of organisational objectives. Present market trends and business in the 21st Century. 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.

EE4022 - SEMICONDUCTOR DEVICE FUNDAMENTALS
ECTS Credits: 6

Electronics & Computer Engineering

EE4023 - DISTRIBUTED SYSTEMS
ECTS Credits: 6

Electronics & Computer Engineering

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

Electronics & Computer Engineering

EE4028 - TELECOMMUNICATION NETWORK ARCHITECTURES 2
ECTS Credits: 6

Electronics & Computer Engineering

EE4034 - TELECOMMUNICATIONS FUNDAMENTALS
ECTS Credits: 6

Electronics & Computer Engineering
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.

Prerequisites: MA4001, MA4002, MA4003

EE4116 - 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.).

EE4118 - 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.

Prerequisites: EE4316

EE4328 - POWER ELECTRONICS
ECTS Credits: 6

Electronics & Computer Engineering

Rationale and Purpose of the Module: This module will give students (electronic, Robotic and Energy students) an understanding of modern power electronics both at the device 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 v 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

Prerequisites: EE4313

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).


Prerequisites: EE4407

EE4512 - DIGITAL SYSTEMS 2
ECTS Credits: 6

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


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


Register-Transfer-Level (RTL) description.

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

EE4514 - DIGITAL SYSTEMS 4
ECTS Credits: 6

Electronics & Computer Engineering
Rationale and Purpose of the Module: Introduces the concepts and design issues for interfacing digital hardware to a microprocessor. This involves bus cycle timing, memory and I/O interfaces (serial and parallel) and interrupt architectures.


Prerequisites: EE4513

EE4607 - TELECOMMUNICATION SYSTEMS 1
ECTS Credits: 6

Electronics & Computer Engineering
Rationale and Purpose of the Module: This module provides students with an insight to the evolution of global communications networks, past, present and future. It includes the role of international standardisation bodies. There is a specific focus on switching and signalling principles in the public network, and it also includes satellite and mobile communications systems and Broadcast TV systems.


DIGITAL MOBILE AND PERSONAL COMMUNICATIONS SYSTEMS: general configuration of cellular systems; comparison with fixed communications systems. Characterisation of the common air interface and design of suitable modulation and coding techniques. Efficient spectrum utilisation techniques. Key concepts in the dynamic management of resources: call control, switching, wireless access and channel allocation, handoff, roaming, HLR and VLR. Evolution of mobile systems: analogue systems, digital systems (GSM, DECT), future systems (wireless LANs, Universal Mobile Telecommunications Systems, Personal Communications Networks).
**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.


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. Linear block codes, 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

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**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.


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**EH4006 - VICTORIAN TEXTS AND CONTEXTS**  
ECTS Credits: 6

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

**Rationale and Purpose of the Module:** 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.

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**EH4002 - CRITICAL PRACTICE 2 - RENAISSANCE LITERATURE**  
ECTS Credits: 6

**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.

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**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 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)

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: 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 globalization, 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).
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.

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

School of Languages, Literature, Culture and Communication

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 ÆraceÆ, ethnicity 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 womenÆs 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 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, Ireland’s Others (e.g. Traveller, minority ethnic, lesbian & gay, and transgender cultures).

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 NCCE 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.

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.

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

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.

**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 biodiversity 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.

**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 internetworking principles.

Network layer: Internet protocol (IP) mobile IP, addressing (IPv4 vs. IPv6); NAT operation (static vs. dynamic); subnetting and super networking; 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.

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.
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.


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**ET4028 - HOST AND NETWORK SECURITY**

**ECTS Credits: 6**

**Electronics & Computer Engineering**

**Rationale and Purpose of the Module:** Gain an in-depth knowledge of host and network security. Assess the security of a network. Recommend and implement measures to prevent security threats. Research and develop security audits. Conversant in current trends and methodologies.

ET4048 - ELECTRONICS FOR BUILT ENVIRONMENT 2
ECTS Credits: 6

Electronics & Computer Engineering

Rationale and Purpose of the Module: This module provides students with 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.

Syllabus:
- Energy Management Systems
- ISO50001
- Energy policy, plan do, check, act
- Energy Audit: Basic components of an energy audit, industrial audits, commercial audits, residential audits.
- Equipment for an energy audit
- SMART Meters: Operation & functionality of SMART meters and means of communication with them.
- Data logging & Databases: Collection, transmission and analysis of utility (electricity, water, gas) consumption data.
- Automated Control for the Built Environment: Building management systems, Energy efficient electrical services, energy efficient space and water heating.
- Economic Analysis: life cycle costing, payback periods, cost benefit analysis.
- Demand side management: Automation of processes to reduce costs and emissions. Dynamic synchronisation of electrical energy consumption with lowest tariffs.

ET4088 - ENERGY MANAGEMENT AND TECHNOLOGY
ECTS Credits: 6

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 is to continue the introduction and analysis of the principles of operation of electronic devices and circuits using the principles introduced in Analogue Electronics 1B. A more in-depth analysis will be undertaken using suitable analysis techniques. At the end of this module students should be able to solve problems concerning simple DC circuit theorems and analyse AC circuits using both the phasor approach and the complex notation approach.

Syllabus:
- SINUSOIDAL SIGNALS: Single phase generation by coil rotating in magnetic field.
- Trigonometric representation, amplitude, frequency and phase concepts. Voltage and current relationships for parallel R-C, R-L and L-C circuits to sinusoidal signals.
- Impedance. Phasor diagrams. Power topics; distinction between power and VA, power factor.
- COMPLEX ANALYSIS: Analysis of circuits using complex notation, derivation of amplitude and phase data from complex representation of signals and impedance.
- Transfer functions, frequency response, corner frequency, Bode diagrams for simple R-C circuits. Power dissipation in complex impedance. Maximum power transfer theorem for complex source and load impedances.
- TUNED CIRCUITS: Series and parallel R-L-C circuits, resonance, Q, bandwidth, dynamic impedance.
- Circulating current in parallel tuned circuit.
- COUPLED CIRCUITS: Inductively coupled coils, induced e.m.f., mutual inductance, coupling coefficient. Reflected impedance for loaded coupled circuit for k < 1. Input and output equivalent circuits. Properties of ideal voltage and current transformers. The auto transformer.

Prerequisites: ET4141

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

ET4142 - COMPUTER SYSTEMS ARCHITECTURE
ECTS Credits: 6

Electronics & Computer Engineering

Rationale and Purpose of the Module: Introduce students to the architecture of modern computers and processors.

Syllabus:
- Use of a microprocessor in a computer; relationship between hardware, software and operating system.
- Memory, I/O and microprocessor in a computer, read/write cycles
- Programmer/Es model of a simple microprocessor, using a simplified 8086 as an example
- Registers, addressing modes (simplied) and instruction set of an 8086, including unconditional and conditional jump and branch instructions, status bits, the stack and subroutines
- Evolution of Pentium from 8086;
- Example of an embedded system and comparison with a PC ã similarities and differences;
- Introduction to the PC, its bus structure and relevance of the BIOS
- Project Work: Writing simple assembly and C programs and verifying their operation; Exploration of PC using ÛMy ComputerÆ and other PC-based tools

Prerequisites: ET4151

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: Operational amplifier structure.
Operational amplifier behaviour: ideal and real
Uses of the operational amplifier in voltage amplification circuits and the introduction of negative feedback.
Electronic filters: overview and key terminology.
Uses of the operational amplifier in low-pass, high-pass and band-pass filters.
Uses of the operational amplifier in non-linear circuits: precision rectifiers, oscillators.
The Instrumentation Amplifier: structure and operation.
Differential signalling, line drivers and hardware for serial data transmission.

Prerequisites: ET4203

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 will introduce the students to the concepts of database design, management and applications, such that they will gain a working knowledge of how to design and build a database and database-driven web sites that meet given business requirements, using industry standard database management systems.

Syllabus:
- Data models & database architectures
- Database Management System (DBMS): typical functions/services and major components
- The relational database model: introduction & additional concepts
- Database design methodology: conceptual, logical and physical database design phases
- Introduction to Structured Query Language (SQL): Data manipulation and Data definition
- Approaches for integrating databases into the web environment; client-server architectures
- Introduction to Microsoft Web Solution Platform: Active Server Pages (ASP) and ActiveX Data Objects (ADO); Introduction to scripting languages
- Web database programming case study

Prerequisites: ET4253, ET4263

ET4725 - OPERATING SYSTEMS 1

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: ET4132

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.

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.


Prerequisites: BY4002, EV4012, BC4902, BY4001

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.
### SYLLABUS

**FR4144 - INTRODUCTION TO FRE**

**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:

(i) by developing students' knowledge of French culture and society

(ii) by focusing on the country's cultural, social and political aspects

(iii) 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 cultures 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 designed to provide students with a platform to broaden and advance their experience of language learning. The course structure is divided into four distinct parts to cover key aspects of contemporary Francophone societies. In the lectures, students are introduced to analytic tools to study specific cultural, social, and political aspects. In the tutorials, they engage with newspaper articles, fostering critical thinking and awareness of the interrelation between culture and language.

### 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:

(i) by developing students' knowledge of French culture and society

(ii) by focusing on the country's cultural, social, and political aspects

(iii) 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 cultures 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 designed to provide students with a platform to broaden and advance their experience of language learning. The course structure is divided into four distinct parts to cover key aspects of contemporary Francophone societies. In the lectures, students are introduced to analytic tools to study specific cultural, social, and political aspects. In the tutorials, they engage with newspaper articles, fostering critical thinking and awareness of the interrelation between culture and language.
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

FR4148 - 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

FR4248 - 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: FR4247

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 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.

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 students’ 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 on selected French social/cultural issues.

FR4922 - FRENCH FOR BUSINESS 2A
ECTS Credits: 6

School of Languages, Literature, Culture and Communication

Rationale and Purpose of the Module: To extend within a French business context students’ reading, speaking, writing and listening skills already practised in the previous terms of university study. This is achieved by revising and increasing students’ 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. 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 students’ reading, speaking, writing and listening skills already practised in the previous terms of university study. This is achieved by revising and increasing students’ 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. 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.

FR4928 - 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 students’ 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, Journal du dehors 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.
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.
- 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 Teasas 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 / Léachtaí:
Lectures will cover the history of the Irish language and early Irish literature. Topics include the genetic relationship between Irish and other European languages, particularly other Celtic ones, and trace the development of the language from its primitive 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.

Prerequisites: GA4105

GA4106 - 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.
- 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 Teasas 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.

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 choisir 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 - LITRÓCHT AGUS SAÍOCHT 4: SCRÍBHNEOIRÍ NA GAELTACHTA
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 into language learning strategies and resources. To provide students with an introduction to the German-speaking countries as physical, cultural and political entities with a focus on the first half of the twentieth century. To introduce students to the analysis of literary texts in German. To consolidate linguistic knowledge (written and oral) gained at school.

Syllabus: To introduce students to the academic study of the German language, its historical, social and structural dimensions as well as into language learning strategies and resources. To provide students with an introduction to the German-speaking countries as physical, cultural and political entities with a focus on the first half of the twentieth century. To introduce students to the analysis of literary texts in German. To consolidate linguistic knowledge (written and oral) gained at school.

Prerequisites: GE4141

GE4146 - GERMAN LANGUAGE AND SOCIETY 4: GERMANY PAST AND PRESEN
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: To introduce aspects of social and regional variation in the German language. To continue introduction to the analysis of literary texts in German. To conclude the revision of grammatical structures enabling students to use them with a high degree of fluency and correctness.

Prerequisites: GE4143
### GE4148 - GERMAN LANGUAGE AND SOCIETY 6: ISSUES AND DEBATES
ECTS Credits: 6

School of Languages, Literature, Culture and Communication

**Rationale and Purpose of the Module:** To explore current issues of particular relevance in the German speaking countries today with a particular focus on literary/cultural controversies.

To heighten students’ awareness of the importance of registers in the German language.

To continue the study of more complex literary texts in German in a wider context.

To consolidate grammatical structures at advanced level.

To further develop writing and oral skills as well as reading comprehension at advanced level.

**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.

- Tutorials: a) discussions of literary texts, newspaper, magazine articles and TV programmes on topical issues focusing on the characteristics of different text types and language registers; b) issues in Austria and Switzerland including presentations in the foreign language; c) translation class English/German with a particular focus on the problem of registers.

**Prerequisites:** GE4147

### GE4212 - GERMAN FOR BEGINNERS 2 (APPLIED LANGUAGES)
ECTS Credits: 6

School of Languages, Literature, Culture and Communication

**Rationale and Purpose of the Module:** This module aims to:
- To give an overview of major trends in German culture and society in the post-war period.
- To consolidate and develop basic communicative skills acquired in GE4211.
- 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.

- Tutorials: 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 co-ordinated and examined in the oral and written exams; one tutorial provides an introduction to German drama and further short stories.

- Language Laboratory: One hour per week will be spent in the computer laboratory, consolidating grammar and develop self-study skills to reinforce material covered during the course.

- 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 co-ordinated and examined in the oral and written exams; one tutorial provides an introduction to German drama and further short stories.

**Prerequisites:** GE4211

### GE4246 - GERMAN LANGUAGE CULTURE AND SOCIETY 4
ECTS Credits: 6

School of Languages, Literature, Culture and Communication

**Rationale and Purpose of the Module:** To develop students’ understanding of contemporary Germany by analysing central issues/concepts from 18th century to the present day; to consolidate and improve 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.

### 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. 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: TEXT, WRITER AND READER**  
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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**GE4924 - GERMAN FOR BUSINESS 4A**  
ECTS Credits: 6

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

**Rationale and Purpose of the Module:** To prepare students for job interviews and applications and to reflect on their professional goals and career aspirations. To enable students to write and communicate successfully in a professional business and/or legal context in a form they are likely to encounter during their work experience and future career.

**Syllabus:** Lecture: Focus on job application process in German-speaking countries, future career familiarisation with current affairs with the focus on economic and legal topics; Tutorial: a) production of business and legal correspondence; b) introduction to translation into English and German; text work in form of summaries and descriptions of graphs etc. c) revision of all grammatical structures, emphasis on passive and indirect speech.

**Prerequisites:** GE4924, GE4143

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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 "Prüfung 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) revision of business
material in general.

Prerequisites: GE4927

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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.

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**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.

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**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.

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**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, N.Y. 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.
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.

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 azero 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

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, resurgency 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'.

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

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: 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.

HI4148 - THE HISTORY OF AUSTRALIA
ECTS Credits: 6

History
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.

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HS4108 - HEALTH AND SAFETY SYSTEMS 2
ECTS Credits: 6

Chemical & Environmental Sciences

Rationale and Purpose of the Module: To develop the students' knowledge of appropriate measuring equipment and evaluation of findings in the context 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 hygiene issues currently pertinent to the workplace environment.

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 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.

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.
**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

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**IN4008 - REINSURANCE / ART**  
**(ECTS Credits: 6)**

**Accounting & Finance**

**Rationale and Purpose of the Module:** To meet the specialist skills requirements of the re/insurance 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

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**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

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**IN418 - 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 the corporate risk management function and the underwriting function within the insurance sector. 3. To introduce students to the theory and practice of underwriting and to acquaint students with the complex and rapidly changing environment within which risk managers operate.


**Prerequisites:** IN4015

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**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.

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**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

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**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 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 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.

**Prerequisites:** JA4413

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**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 ones 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

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**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:** JA4917

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**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' 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's 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, DBlII) 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 evolution of some of the distinguishing features of the major legal families and to examine some alternatives offered by non-western cultures.


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 thereo.

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.

LA4048 - ADVANCED 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: Section A.
Working in small groups with a dedicated faculty advisor, students will complete study and participation in the topics outlined in Section A of Advanced Lawyering 1, dealing with such issues as the PIAB and Commercial Court, including collaborative law, mediation and arbitration.

Section B.
Students will continue with their selection from Advanced Lawyering I: Business Law Clinic; e-Journal; Research Article; Conveyancing Problem; Moot Trial; ADR process

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.

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.

LA4082 - LAW OF EVIDENCE
ECTS Credits: 6

Law

LA4098 - 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.

LA4122 - CONTRACT LAW 2
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.

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 directive principles of social policy under the Irish Constitution.

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.


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 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 module covers the administration of companies insofar as topics covered include; the appointment, role and duties of Directors, the role and
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.

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**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.

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**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.

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**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.

**Syllabus:** The nature of land law and its historical evolution, the concept of estates and tenure. Freehold estates, fee farm grants, fee simples, fee tails, life estates, pyramid titles, future interests, incorporeal hereditaments. Co-ownership. registration of interests in real property. Extinction of interests, adverse possession, merger. Disabilities.

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**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...
### 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 sociolinguistic studies further, if you wish to.

**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

### MA4002 - ENGINEERING MATHEMATICS 2

**ECTS Credits: 6**

**Mathematics & Statistics**

**Rationale and Purpose of the Module:** To develop the student’s understanding of and problem solving skills in the areas of 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.
- [Ordinary Differential Equations]: first order including variables separable and linear types. Linear second order equations with constant coefficients. Numerical solution by Runge-Kutta.
- [Functions of several variables and partial differentiation. ] Fitting a line or curve to a set of data points.

**Prerequisites:** MA4001

### MA4004 - ENGINEERING MATHEMATICS 4

**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.


### MA4006 - ENGINEERING MATHEMATICS 5

**ECTS Credits: 6**
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'). Partial Differential Equations: Modelling and derivation of wave, heat and Laplace's equation. Solution of such equations by separation of variables. Numerical methods for the solution of partial differential equations using finite differences.

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.


Mathematics of finance: compound interest, geometric progressions, frequent value, sinking funds, annuities. Matrices and determinants (2x2) and (3x3) matrices: examples, definitions, matrix operations, (2x2) and 3x3 determinants, matrix, inversion, representing and solving linear systems, Cramer's rule. Linear programming: linear inequalities in 2 variables, graphing linear inequalities, feasible region, graphical method of solution.

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 and 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 simple linear regression.
9. Use of a statistical package (SPSS) for data input and transformation, as well as carrying out the statistical methods described above.

Prerequisites: MA4601

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 Eulers 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 unit step function and transforms of piecewise continuous functions; Fourier transform and its relation graphs and derivatives.

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.

MA4402 - COMPUTER MATHS 2

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 math 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.

MA4602 - SCIENCE 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 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
to the Laplace transform.

Prerequisites: MA4602, MA4601

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: MS4007

MA4607 - TECHNOLOGICAL MATHEMATICS 1
ECTS Credits: 6

Mathematics & Statistics

Rationale and Purpose of the Module: To introduce applications of calculus in science and 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: 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, MA44701

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), variables and attribute, control & out of control, specification, 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 conceptual introduction to the field of statistics and its applications. To enable students to apply statistical methodologies in their own organisations. 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

The course will be underpinned by extensive use of Case studies
Statistical software packages
Student organisation based assignments.

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

MB4005 - ANALYSIS
ECTS Credits: 6

Mathematics & Statistics

Rationale and Purpose of the Module: To develop an understanding of formal methods of mathematical analysis, as applied to sets, real numbers, and general topology.


Prerequisites: MS4021, MS4022

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: Sets 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: MB4001, MB4002

Rationale and Purpose of the Module: To develop understanding of the theory of differential equations. To study standard solution techniques. To apply differential equations to real situations.

MB4018 - DIFFERENTIAL EQUATIONS
ECTS Credits: 6

Mathematics & Statistics

Rationale and Purpose of the Module: To study standard solution techniques. To develop an understanding of the theory of differential equations. To study selected applications in Science and Engineering.

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

MD4022 - INTRO TO TRADITIONAL MUSIC AND DANCE STUDIES 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 styles, Irish language song tradition, nineteenth-century collections, contemporary issues, sean-nós and set dancing.

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
**Rationale and Purpose of the Module:** To provide a deeper understanding of the historical development of 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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**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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**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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**Rationale and Purpose of the Module:** Contextualising 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 musico-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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**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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**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 ethnographic 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, ethnomusicology, 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; ceili 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 of 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 students 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.

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**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

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**ME4008 - ORTHOPAEDIC BIOMECHANICS AND MECHANOBIOLOGY**
ECTS Credits: 6

**Mechanical, Aeronautical and Biomedical Engineering**

**Rationale and Purpose of the Module:** This module will provide the student with an understanding of the role of mechanics in regulating orthopaedic tissue development and homeostasis at both the organ and cellular level.

**Syllabus:** Development and structure of bone; Bone biomechanics; Composition and structure of cartilage; Cartilage biomechanics; Structure and mechanics of the ligament and tendon; Computational models in orthopaedic biomechanics; Cell mechanics; Models of cell mechanical behaviour; Cellular mechanotransduction; Bone mechanobiology; Cartilage mechanobiology; Ligament and tendon mechanobiology; Techniques in mechanobiology; Mechanical stimulation of cells; Orthopaedic tissue engineering; Bioreactors in Tissue Engineering;

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**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

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**ME4111 - AIRCRAFT 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

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**ME4116 - 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

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**ME4226 - MECHANICS OF SOLIDS 2**
ECTS Credits: 6

**Mechanical, Aeronautical and Biomedical Engineering**

**Rationale and Purpose of the Module:** To understand
and analyse and measure the state of strain at a point in a 2D strain field.
To analyse stresses and deformation in circular plates under symmetrical loading. To be able to determine
displacement under multiaxial loading. To be able to predict
the maximum deflection of a beam subjected to simple
and complex loading in a plane. To predict the buckling
load and maximum stress in a strut. To understand the
factors influencing fatigue life and be able to predict the
life of simple engineering components. To understand
the basics of LEFM. To analyse the stresses in beams of
unsymmetrical section.

Syllabus: Infinitesimal strain at a point in a 2D stress
field and Mohr's strain circle. Selection of strain gauges
for measurement on metals. Thin circular plates.
Criteria of failure for isotropic homogeneous materials
(Rankine, Tresca and Von Mises). Deflection of beams.
Buckling of struts (Euler and Rankine-Gordon). LEFM. Fatigue. Unsymmetrical bending.

Prerequisites: ME4213

ME4306 - BIOCOMPATABILITY
ECTS Credits: 6
Mechanical, Aeronautical and Biomedical Engineering
Rationale and Purpose of the Module: To give a basic appreciation of the Cellular-Material Interactions that occur when a Material is used for different Biomedical Applications
Syllabus: Discussion of Pathological Changes and Approaches to repair. Classification of medical device interactions and methods of assessment. Relevance of testing to medical device design strategy, regulation, validation and post market surveillance. Evolution of the regulatory environment and its implications.

ME4308 - BIOMATERIALS 2
ECTS Credits: 6
Mechanical, Aeronautical and Biomedical Engineering
Rationale and Purpose of the Module: To gain 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.

ME4328 - AIRCRAFT MAINTENANCE
ECTS Credits: 3
Mechanical, Aeronautical and Biomedical Engineering
Rationale and Purpose of the Module: To familiarise the students with the regulatory framework and engineering context to the safe operation of commercial heavy and light aircraft from a design and MRO perspective
Syllabus: Aircraft maintenance: philosophy of maintenance, inspection schedules, EASA regulatory requirements, condition monitoring, original equipment manufacturer/Es (OEM) recommendations, management of materials, durability and reliability of materials and components, replacement decisions, traceability of materials and components and ageing aircraft programmes.
Introduction to the failure effects and reliability analysis of aircraft systems. Aircraft repair and inspection: causes and mechanisms of corrosion including galvanic, pitting, fretting and stress corrosion; design, control and maintenance practices for improving resistance to corrosion, non destructive testing (NDT) techniques and procedures, general inspection procedures; analysis and design of repair procedures for both metallic and composite structures

ME4412 - FLUID MECHANICS 1
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
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

ME4414 - FLUIDS MECHANICS 2
ECTS Credits: 6
Mechanical, Aeronautical and Biomedical Engineering
Rationale and Purpose of the Module: To apply the principle 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.

ME4417 - BOUNDARY LAYER THEORY
ECTS Credits: 6
Mechanical, Aeronautical and Biomedical Engineering
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.
Rationale and Purpose of the Module: 1. To provide the students with a fundamental understanding of the theory and application of computational fluid dynamics (CFD) as implemented by the finite volume technique. 2. To provide the students with a working knowledge of a commercial CFD code via practical computer laboratory sessions.

Syllabus: The philosophy of CFD; fundamentals of vector fluid dynamics; fundamentals of viscous fluid deformations; the governing equations of fluid dynamics; basic discretisation and grid generation techniques; the finite volume method; application to convection-diffusion problems; pressure-velocity coupling; implementation of boundary conditions; fundamentals of turbulence modelling.

Prerequisites: ME4423

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
To be able to apply the method to problems in solid understanding of the underlying concepts of FEA.

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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**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.

Syllabus: Advanced Control Strategies
  Control of Multi-Input-Multi-Output (MIMO) Processes
  Development of Discrete-time Models
  Dynamic Response of Discrete-Time systems
  Analysis of Sampled-Data systems
  Design of Digital Controllers

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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.


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 dependent 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

ME4746 - PHYSIOLOGICAL FLUID MECHANICS 2
ECTS Credits: 6

Mechanical, Aeronautical and Biomedical Engineering

Rationale and Purpose of the Module: To advance the knowledge of students physiological fluid mechanics; specifically introducing concepts and applications in mass transport and heat transport.


Prerequisites: ME4807

ME6001 - FUNDAMENTALS OF CONTINUUM MECHANICS
ECTS Credits: 6

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
Solving and decision
Develop cognitive modelling/visualisation, problem
specifications in the context of the total development of a
Be able to create comprehensive product models and
contemporary computer modelling software.
Model and develop products and components in
3D parametric modelling and visualisation technology.
Understand the concepts and practices associated with
creative approach to the solution of design problems.
involved in designing a new product and develop a
context of generic best practic
six key product design areas using SolidWorks in the
The aim of this module is to introduce students to these

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**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.
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**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, problem-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
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**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.
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**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.
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**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
projects, inductive hypothesis testing, option evaluation and solution selling. This module is contingent in terms of content and will likely vary from year to year, depending on the contemporary issues in management at time of delivery. Current examples would be managing lean organizations, structuring businesses for unstable markets, turnaround management and managing in developing countries.

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**MG4604 - AIR TRANSPORTATION**

*ECTS Credits: 6*

**Management and Marketing**

**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.

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**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. Provide students with an appreciation of the need to manage knowledge as an organizational 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

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**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:** MK4002

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**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.
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 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 process of strategic analysis based on an assessment of key 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

MK4008 - APPLIED MARKETING 2
ECTS Credits: 6

Management and Marketing

Rationale and Purpose of the Module: The emphasis of this module will be the development of planning, implementation and communication skills. To foster an ability to produce effective customer communications through a range of media. To enhance oral and written marketing communication skills.


MK4014 - BRANDING
ECTS Credits: 6

Management and Marketing

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 is 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.

MK4603 - MARKETING
ECTS Credits: 6

Management and Marketing

Rationale and Purpose of the Module: 1. To introduce relational approaches to marketing.
2. To understand the nature and importance of interaction in service, intra-organisational and mass marketing contexts.
3. To understand the process of relationships development and to appreciate relationship success variables and how they might be fostered.
4. To consider approaches to relationship management including CRM.
5. To understand competitive and collaborative networks and the strategic implications for individual organisations.
6. To appreciate the implications of marketing when viewed as interaction, relationships and networks.

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;

Zeroes of nonlinear functions: Bisection method, Newton/Fs method, Secant method, fixed point method; convergence criteria, rate of convergence, effect of multiplicity of zero; introduction to the use of Newton/Fs 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 -- numerics 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: This module introduces the student to sequences and series, integral calculus, ordinary differential equations and functions of several variables. It develops problem solving skills in these topics.

Syllabus: Sequences and series: Limit of a sequence, convergence of a sequence; series, convergence, tests for convergence, absolute and conditional convergence. Power series.

- MacLaurin and Taylor series: Order notation, big-O, little-O notation, asymptotic equivalence, Taylor’s Theorem and remainders, applications.

- Indefinite Integral: Integration of standard functions, techniques including integration by parts, substitution and partial fractions.

- Definite Integral: The limit of a Riemann sum, fundamental theorem of calculus, Area between two curves, Volumes of revolution, Improper integrals.

- Introduction to ordinary differential equations: Definition of an ODE, linearity, first order variables separable, solution technique by integration.

- Introduction to functions of two real variables: Continuity, partial derivatives and their geometrical interpretation, Leibniz’s rule, conditions (without proof) for maximum, minimum, saddle-point.

Prerequisites: MS4021

MS4024 - NUMERICAL COMPUTATION  
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 batch 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 Matlab - topics to be taken from:

The R language:

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 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.

**Syllabus:** Introduction to Monte Carlo simulation;


Modelling markets with stochastic differential equations:

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

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**MS4111 - DISCRETE MATHEMATICS 1**
ECTS Credits: 6

**Mathematics & Statistics**

Rationale and Purpose of the Module: The aim of this module is to introduce students to some of the language of Discrete Mathematics, and to show its relevance, particularly in the context of Computer Science. It is taught at a level that is appropriate to first year students, i.e. without an excess of formality. The module should re-inforce the development of the students "thinking" skills, and should enable them to undertake further study in the various applied areas of Discrete Mathematics (coding, graphs, logic and formal systems etc)

**Syllabus:** Review of sets and operations on sets, power sets.

Propositional logic, truth tables, propositional calculus,
Predicate logic, quantifiers, equivalence, application to (mathematical) proof.

Cartesian product of sets, relations, equivalence relations, matrix representation of relations, composition of relations, functions, types of functions.

Number systems, natural numbers, integers, rationals, reals, axioms for N, proof by induction, recursive definitions and algorithms, recurrence relations.

Representations of N (binary, octal, etc), other number "fields".

Introductory combinatorics, permutations, combinations.

**MS4122 - 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.
- Orthonormal 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.

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

**MS4212 - INTRODUCTORY DATA ANALYSIS**

**ECTS Credits:** 6

**Mathematics & Statistics**

**Rationale and Purpose of the Module:** This course introduces students to the formalities of statistical inference with special emphasis on problems of estimation, confidence intervals, and hypothesis testing.

**Syllabus:**

- The notion of a probability model: examples, the need for estimation, confidence intervals and hypothesis tests.
- Inference for normal data: chi-squared, t, F, confidence intervals, hypothesis tests, two means, two variances.
- Central Limit Theorem: normal approximation to the binomial, application to inference for a single proportion and the difference between two proportions, the chi-squared test for independence.
- The likelihood function: the maximum likelihood estimate (MLE), iterative methods for calculating MLE.
- Repeated sampling properties: bias, variance, mean squared error, Cramer-Rao theorem, efficiency, the large sample behaviour of maximum likelihood estimates.

Interval estimation: pivotal quantities, confidence intervals, approximate confidence intervals based on the MLE.

Hypothesis testing: test statistic, Type 1 and Type 2 errors, power function, the likelihood ratio test.

**Prerequisites:** MS4213

**MS4218 - TIME SERIES ANALYSIS**

**ECTS Credits:** 6

**Mathematics & Statistics**

**Rationale and Purpose of the Module:** This course introduces 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.

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**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 some 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.

Regression Models: least squares line; transforming to linearity; out-of-sample prediction.

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**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

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**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


Unconstrained Optimisation. Univariate Functions: Line Searches.

Multivariate Functions: Steepest Descent and Newton’s Method,

Modifications of Newton’s Method including Levenberg-Marquardt Method.

Conjugate Gradient Methods.

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.

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**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.
To introduce the theory and applications of first order linear and nonlinear partial differential equations of mathematical physics.

Syllabus: [Introduction to PDEs:] Introduction to the partial differential equation of physics; classification of second order linear partial differential equations (hyperbolic, parabolic, elliptic).
[Wave equation:] Derivation of wave equation for strings and membranes; solutions by separation of variables; harmonics; d'Alembert’s solution; applications to light and sound.
[Laplace's equation:] steady state heat flow; cylindrically symmetric solutions and Bessel functions; spherically symmetric solutions and Legendre functions; flow in porous media.
[Diffusion equation:] Derivation of heat/diffusion equations in one dimension; relation to Brownian motion (random walk) in two and three dimensions; application to chemical diffusion; solutions by separation of variables.
[First order PDEs:] Linear and quasilinear first order partial differential equations; characteristics; applications in chromatography, glacial flow, sedimentation; breaking waves and shocks; diffusion and dispersion (Burger's and KdV equations).

Prerequisites: MS4403

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: 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

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, Newton's laws of motion, friction, Newton's 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, MS4613

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; Black's 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.

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, emphasising 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 Young's 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.
**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.
- Explorations of theories of polymers and application to melt rheology, diffusion, dissolution and fracture.
- Creep in polymers, linear and non-linear viscoelasticity.
- Electrical properties, dielectric relaxation, electrical conduction.
- Impact behaviour and fracture.
- Crystal morphology, crystal growth and melting processes.
- Entanglement theories of polymers and application to melt rheology, diffusion, dissolution and fracture.
- Polymer stability, combustion, weathering, degradation and protection, physical ageing.
- Biodegradable materials.
- Theories of rubber elasticity. Natural and synthetic elastomers.

**Prerequisites:** MT4013

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**MT4008 - PROPERTIES OF MATERIALS B**
**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 systems including environment and occupational health and safety are also introduced.

**Syllabus:**
- Introduction
- What is quality
- Quality Assurance Vs Quality Control
- Interface between quality and other business functions
- Inter-relationships between quality, reliability, price and delivery.
- Quality Management Systems (QMS)
- Historical development of ISO 9000
- Introduction to ISO 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

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**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:**

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**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 and metallic treatments or mechanical working.

**Syllabus:**

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**MT4943 - MATERIALS PROCESSING**
**ECTS Credits:** 6

**Civil Engineering and Materials Science**

**Rationale and Purpose of the Module:** To explain how metals and polymers are converted into products and to identify the key features of the processes involved.

**Syllabus:**
- The response of polymers to heat, melt processing, material properties affecting melt processing.
- Extrusion of plastics, injection moulding and other plastics processing methods. Analysis of process operations.
- Metals processing, solidification and nucleation processes. Casting and forging methods, post production treatment, prevention of residual stress, process design and optimisation.

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**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.

**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

**Syllabus:** Biomedical microorganisms. Description of micro-organisms and their pathogenesis. Clinical manifestations, risk factors, diagnosis, treatment considerations of common infections and selected infections using specific pathogens.

**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


**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.


**Clinical Skills:**
- Policy Guidelines and guidelines, (ABA and local) and:
- Bord Altranais agus Náisiún na hÉireann and local guidelines and their application to practice
- Medication safety procedures
- Drug calculations
- Administration routines and routes
- Medication errors and medication safety
- Care and management of women with epidural/spinal anaesthesia
- Blood and blood products
- Blood transfusion

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**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.


**Clinical Skills:**
- Policy Guidelines and guidelines, (ABA and local) and:
- Bord Altranais agus Náisiún na hÉireann and local guidelines and their application to practice
- Medication safety procedures
- Drug calculations
- Administration routines and routes
- Medication errors and medication safety
- 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.


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**Clinical Skills**
Microteaching in a clinical setting
Microteaching in a classroom setting
Clinical competencies:
assessment/documentation/feedback

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**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

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**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 wellbeing 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 impacting 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 and 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.

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**NS4084 - CARE OF THE AT RISK AND ILL NEONATE**
ECTS Credits: 6

**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, midwives 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

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**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 is promoted.


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 hypothenmia. 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 Intrathoracic drainage: underwater seal drain
- Postural drainage
- Intravenous infusions
- Introduction to blood transfusion

**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. The module aims to develop students’ understanding of the nature and manifestations of pain and to explore current pain management practices. The purpose of this module is to facilitate students’ understanding of neurological 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
- Assisting patients with mobility

**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

**Syllabus:** Nursing assessment and diagnosis within the nursing process framework. Nursing diagnosis and basic concepts. The development of nursing assessment and diagnosis, issues, types and components. Nursing assessment tools and strategies. used in the different healthcare settings. Current healthcare policies. The formulation of nursing diagnosis and assessment within a clinical practice model. Manuals of nursing diagnosis, e.g. The North American Nursing Diagnosis Association and the international classification of nursing practice. The care planning processes and systems.

**NS4322 - NURSING THE CHILD WITH INTELLECTUAL 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

NS4324 - NURSING THE INDIVIDUAL WITH MULTIPLE NEEDS
ECTS 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 with associated physical and sensory impairment.


Clinical Skills Syllabus:
Breast awareness
Testicular examination
Cervical screening
Monitoring of blood glucose and administration of insulin
Wound management and associated dressing techniques

NS4422 - MOOD AND EMOTIONAL DISORDERS AND MENTAL HEALTH NURSING
ECTS 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 health care 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

NS4424 - NURSING THE OLDER PERSON WITH INTELLECTUAL DISABIL
ECTS 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

NS4434 - PSYCHOTIC AND PERSONALITY DISORDERS AND MENTAL HLTH
ECTS 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

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

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.

PA4012 - PARA-GOVERNMENTAL ORGANISATIONS
ECTS Credits: 6

Politics and Public Admin

Rationale and Purpose of the Module: To analyse and explore the role and functions of Paragovernmental Organisations (PGO) as instruments of indirect public administration generally and within the context of the politico-administrative system in Ireland.

Syllabus: Part A: Paragovernmental Organisations as instruments of indirect administration; State-sponsored Bodies (SSBs) as manifestation of the PGO type in Ireland; commercial (public enterprise) and non-commercial (administrative agency) SSBs; legal, structural and financial characteristics of SSBs; roles of minister, board, management and Houses of the Oireachtas in the structure of accountability of SSBs. The evolving regulatory environment of SSBs.
Part B: Economic rationale for government intervention in the economy and the role of public enterprise; review and performance evaluation of public enterprise in Ireland since the foundation of the state; major concepts and trends in the regulation of public enterprise, privatisation and public private partnerships generally and in Ireland

PA4017 - SUB NATIONAL GOV. IN EUROPE: CHALLENGE AND CHANGE
ECTS Credits: 6

Politics and Public Admin

Rationale and Purpose of the Module: Using a comparative and thematic approach (within a Joint European Module subscribed to by 11 European universities) this course aims to explore various systems of subnational government, the changing relationships between the different levels of government and to examine the origin, nature and implications of the challenges facing sub-national governments in Europe.

Syllabus: The salience of sub-national government; evolution of different forms of subnational government; differences between supra-national, national and subnational government and relationships between the different levels of government; theoretical perspectives on the study of sub-national government; state, region and locality in the Anglo, French, Germanic and Scandinavian traditions; recent developments in Central and Eastern Europe; the European dimension of sub-national government; comparative trends in reform; the current challenges and future prospects confronting sub-national governments

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 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 ū Simon, Lindblom, Allison, Etzioni, Dror; institutional approaches; rational choice theory; policy networks; policy transfer; policy implementation; evaluation,
accountability; Europeanisation

Prerequisites: PA4021

PA4038 - PUBLIC ADMINISTRATION IN DEMOCRATIC STATES
ECTS Credits: 6

Politics and Public Admin

Rationale and Purpose of the Module: All states distinguish between those activities that are best carried out on behalf of the people by the state, those that are best left to markets, and those that are most appropriately the responsibility of individuals, families and other civic organisations. In this module we examine the alternative views about where best to draw these lines, with a view to more fully comprehending the choices that face all governments and citizens.

Syllabus: The exposition is largely chronological. We begin with an introduction to the precepts of classical political economy, the challenges presented to these views by the development and growth of social democracy, and alternative explanations for the relationship between markets and welfare. We proceed by examining the historical development of welfare states in Europe, their growth and contraction and associated political movements and look at the impact of these on state administration. Towards the end of the module, we will attempt to apply the ideas and concepts that we have explored at a more general and European level specifically to the Irish case. We end with a series of contemporary Irish case studies which critically examine the most recent (alleged) ‘transformation’ of the Irish state.

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 bring the design ideas proposed in Semester 7 to a high level of professional execution.

PD4018 - DESIGN PROJECT 2
ECTS Credits: 18

Design and Manufacturing Technology

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:

To develop design ideas to a high level of professional execution.

To bring design concepts to a professional standard of aesthetic refinement.

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 photo-realistic 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).

Syllabus: Interpretation of 3D forms and detail design in 2D rendering.
Develop a visualisation skill-set in computer-based visualisation.
CAD used as a tool in the processes of design visualisation (product renderings) and representation to convey product form, finish, texture and meaning.
Contextualisation of products in environments of use.
Communication of design concepts.
CAD used as a design tool in graphic design and presentation.
Project-based-learning in Design visualisation underpins the Studio learning method.

Prerequisites: ID4811, ID4812

Prerequisites: PD4017

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 -
Develop an ability to effectively progress concepts
Improve concept development skills through exploration design ideation.
Collate, analyse and synthesise research findings.
Improve primary design research skills.
Collaborate with industry partners.
Implement a variety of design tools and methodologies.
Understand and develop an ability to reflect on personal design work. Application of this theory to their own work through project based studio classes.

**Syllabus:**
- Evaluation and filtering methods for concept selection.
- Idea generation techniques.
- Implementation of entire design process from research to design detailing.
- 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. 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.

**PD4104 - DESIGN STUDIO 4**
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.

**Syllabus:**
- 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.

**PH4008 - HYDROCARBON FUELS**
ECTS Credits: 6

**Physics and Energy**

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.


Prerequisites: PH4011

PH4018 - MEDICAL INSTRUMENTATION
ECTS Credits: 6

Physics and Energy

Rationale and Purpose of the Module: To introduce the medical device directive and the regulatory environment.

* To give the student a working knowledge of the operation of some medical equipment
* To introduce the student to the scientific basis of the well known radiological equipment commonly in use in our hospitals and medical research institutes.
* To provide a working knowledge of the operation of this equipment.


PH4022 - 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.

PH4038 - ENERGY STORAGE
ECTS Credits: 6

Physics and Energy

Fundamentals of advanced energy conversion and storage.


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 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 & electrolytic 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

PH4042 - THERMAL PHYSICS
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 of mechanics, optical and electronic transport properties of nanostructured materials and to develop an understanding of the importance of mechanical and electro-optical properties in applications of nanostructured materials.


Prerequisites: PH4081

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, Gaussian 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
PH4092 - SEMICONDUCTOR DEVICES
ECTS Credits: 6

Physics and Energy

Rationale and Purpose of the Module: To introduce the student to semiconductor devices, electronic logic and digital devices

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 i.e. the emitter amplifier, early effect; the field effect transistor, JFET, MOSFET, characteristics and application in simple circuits. Combinational Logic: Binary Logic, Logic functions; AND, OR, NOT; Truth table; Boolean Algebra; Boole Boolean postulates and theorems, De Morgan; Logic gates

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 to 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 Schroedinger 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. Ethical conflicts in specific case studies, and the process
of ethical decision making involved in their resolution. Issues relating to life and death arising from nursing and
midwifery practice for example, i.e. the definition and medical management of death.; abortion.; assisted
human reproduction, challenging care.; physical and intellectual disabilities, those in need of intensive care;
the elderly. health, the goal of therapy older person. Main traditional ethical theories (utilitarianism,
deonology, virtue ethics) and contemporary advancements upon them (principlism, narrative ethics,
ethic of care, feminist ethics) and their relevance for practical decision making in nursing and midwifery
practice

PM4008 - EMPLOYMENT RELATIONS PRACTICE
ECTS Credits: 6

Personnel & Employment Relations

Rationale and Purpose of the Module: Explore the
key operational practices in the conduct of employee
relations.
Examine the issue of conflict in the context of the
employment relationship.
Expose students to theory and practice of negotiation
and conflict handling.
Appreciate the role of negotiation in the conflict
resolution process.
Allow for a knowledge of the key 3rd party institutions in
the context of workplace conflict resolution.

Syllabus: Understanding of sources of conflict in the
workplace and possibilities for resolution; managing
collective and individual issues; applying the regulatory
framework to conflict issues; the nature of negotiation;
integrative and distributive bargaining; strategy and
tactics of distributive bargaining; negotiation planning
and strategy; negotiation breakdown; communication
and persuasion processes in negotiation; power in
negotiation; third party intervention; analysing a moot
labour court hearing; negotiation exercise and case
study.

PM4014 - HUMAN RESOURCE DEVELOPMENT
ECTS Credits: 6

Personnel & Employment Relations

Rationale and Purpose of the Module: This module is
designed to provide students with a conceptual
appreciation and practical understanding of Human
Resource Development in organisations. There is a 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 cwyhç 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
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.


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.
**Rationale and Purpose of the Module:** To further develop the students' plane and descriptive geometry problem-solving skills.

**To help students critically understand the pedagogy of junior cycle technical graphics.**

**To engage students in developing teaching resources for junior cycle technical graphics.**

**To introduce students to the principles and concepts of parametric solid modeling using SolidWorks.**

**To introduce students to best practice sketching, modelling and assembly strategies for design intent as part of the design process.**


**Prerequisites:** PN4001

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**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.**

**Syllabus:** Components of an automated system, controllers, servo motors and feedback. A/D and D/A conversions. Binary and analog outputs and inputs to devices. Interfacing with, and control of devices using CircuitWizard software. Robot classification and control, degrees of freedom, programming techniques. Peripheral Interface Controllers (PICs) and their applications to simple automation projects. Design of working PIC circuits incorporating Input and Output devices. Compressors, receivers, valves and cylinders. Use of pneumatic simulation software. Design and construction of pneumatic circuits. Design, analysis and testing of planar linkages for Generation of a straight line motion by linkage mechanism. Reproduction of a path traced by one point at another tracing point with a change in scale. Transfer of torque and motion between non-coaxial shafts with changing relative alignment. Automotive steering mechanisms and suspension mechanisms.

**Prerequisites:** PN4101

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**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, 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.


Consideration of the impact of selected processing methods on the work environment.

**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.

**Syllabus:** Freehand sketching of geometry problems. Dynamic mechanisms: involutes and spirals, cycloidal curves, gears, cam profiles, helix and helical applications. Structural forms: singly and doubly ruled surfaces, hyperbolic paraboloid, hyperboloid of revolution, geodesic domes, plane directors. Geologic geometry: dip, strike and thickness of ore strata, road geometry, cuttings and embankments for level and inclined constructions, skew boreholes. Surface geometry: dihedral angles, changes in design. Understanding of advanced plane and descriptive geometry.

Assembly techniques. 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 and political organisations and the governance of institutions such as the World Bank, International Monetary Fund and World Trade Organisation.

PO4008 - AFRICA: 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)
- Democratisation 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: states 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 evolution of the party system; electoral behaviour; social bases of party support; overview of the principal political institutions, including the presidency, the Oireachtas, the Government, the Taoiseach and the civil service.

PO4015 - GOVERNMENT AND POLITICS OF THE EU
ECTS Credits: 6
Politics and Public Admin
Rationale and Purpose of the Module: The module aims to develop students' understanding of the way the European Union works and how its policy output and powers affect their lives as citizens. As a result, the module has two objectives. First, to give students a solid
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 may include, but are not limited to:
- Leninism and Bolshevism as political theory
- The 1917 revolution
- The relationship of Leninism and Stalinism
- The development of the Stalinist system
- The great terror
- Khrushchev and destalinisation
- The institutions of the USSR: the party-state system
- Theories of the development of the Soviet system
- The political economy of the USSR
- Soviet foreign policy

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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 politics and to understand 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.

**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 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**

**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; 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 management; the welfare state and social policy; plus Ireland’s role in the EU and beyond.

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**PO4098 - ISSUES IN WORLD POLITICS**

**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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**PO4102 - METHODS AND RESEARCH IN POLITICAL SCIENCE**

**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

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**PO4108 - MULTICULTURALISM AND POLITICAL THEORY**

**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 a 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; and understand a range of arguments for and against...

**Syllabus:** Multiculturalism and Political Theory; Pluralism; Citizenship; Tolerance; The Politics of Recognition; Liberal Culturalism; Cosmopolitan Criticisms; Feminist Objections; Democracy and Minority Representation; Education and Cultural Diversity; Headscarves; Universalism, Ethnocentrism and Relativism

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**PO4118 - IRELAND AND EU MEMBERSHIP: ADAPTING POLITICS, POLICY AND POLITY**

**Politics and Public Admin**

**Rationale and Purpose of the Module:** This module aims

To examine the nature and impact of Irelands membership of the EU
To explore the theoretical interpretations of Europeanisation
To systematically investigate the impact Europeanisation has had on selected 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 Irelands political and policy processes.
Syllabus: Conceptualising and theorising Europeanisation.

Rationale and Purpose of the Module: The purpose of this module is to examine, and critically evaluate, the European Union as a global actor. The evolution of the Union's Common Foreign and Security Policy (CFSP) will provide the backdrop for a discussion of ways in which the Union (as a "normative power") seeks to transmit influence and values beyond its own borders.

Syllabus: This module provides students with foundational information about how psychologists have studied human development from prenatal life through childhood, adolescence and adulthood. The course will focus on the topics of cognitive, biological, social and moral development, from the field of psychology. These topics are studied from a lifespan perspective.

Prerequisites: PS4032, PS4031

ECTS Credits: 6

Psychology

Rationale and Purpose of the Module: For students to extend and deepen their knowledge of human development through the lifespan within the field of psychology. To develop skills in identifying and critically examining major tenets of psychological theory in relation to development through childhood, adolescence and adulthood.

Syllabus: Personality is a collection of emotion, thought and behaviour patterns that are unique to an individual. Through a series of lectures and practical tutorial sessions, topics relevant to the psychology of personality will be explored; including defining personality, temperament, aptitude and difference; personality and intelligence testing; and models including factorial models, typologies and circumplexes.

Prerequisites: PS4032, PS4031

ECTS Credits: 6

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: 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 and advocacy.

ECTS Credits: 6

Psychology

Rationale and Purpose of the Module: 5.1 For students to receive an overview of research within the field of psychology.

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

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 shortcoming associated with the traditional experimental approach and familiarises them 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

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

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

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 studentÆs 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 though the use of selected examples. Students are encouraged to become increasingly familiar with SPSS for coding of data and simple inferential statistics are introduced.

PS4107 - ABNORMAL AND CLINICAL PSYCHOLOGY
ECTS Credits: 6

To introduce students to more advanced epistemological and methodological debates in the subdiscipline as well as to historical and cultural variations in social psychological research.

Syllabus: Social psychology is a 'broad church' in terms of the values, theories and methods applied across the subdiscipline. More than other areas of psychology it also reflects the contemporary concerns and values of the societies in which it occurs. The purpose of this module is to provide students with a more indepth knowledge of the core topics of social psychology, but also to put these topics in their socio-political and historical context and to critically evaluate psychological research from different epistemological and methodological grounds. Topics will include: advanced group processes; intergroup conflict; discursive social psychology; measurement in social psychology; critical perspectives in social psychology.
Psychology

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.

Prerequisites: PS4011

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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.

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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.

Prerequisites: PS4011

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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 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/MRP II). 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

Syllabus:
2. Total Quality Management, human resource issues, sourcing policy
3. Quality Costs
4. Problem solving tools
5. Benchmarking and Quality Function Deployment.

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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 modelling and its application to manufacturing, logistic and services systems. To provide students with modelling and software capabilities to apply simulation to manufacturing, logistic and services systems.

Syllabus: Introduction to simulation Overview of simulation modelling, introduction to the basic concepts of discrete event simulation. The simulation process steps involved in carrying out a simulation project. Comparison of discrete event simulation with continuous simulation and system dynamics. Computer simulation packages Overview of available computer packages, description of representative packages, computer implementation issues. Development of programming skills to apply simulation to manufacturing, logistic and services systems using a generic simulation package. Provide an overview of available simulation software. Statistical aspects of simulation Input analysis, random number generation, output analysis, experimental design. Queuing Models Provide comparison of simulation with stochastic mathematical models through the introduction of basic queuing models. Systems Design Using simulation students will carry out systems (manufacturing, logistic and services systems) design assignments.

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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.


Prerequisites: PT4111

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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.

Baldrige Award (USA), Deming Prize (Japan)

Design of Experiments - Introduction to Traditional DOE and Taguchi Methods
- System Parameter and Tolerance Design.

Failure Mode and Effect Analysis (FMEA) - Definitions and Methodology, Product and Process FMEAs.
- Process Control Plans.
Manufacturing and Business Process Improvement Methodologies - Improving run time performance
Rapid Prototyping - Rapid Prototyping Merits and Processes (LOM, SL5, FDM)

Several case studies will be examined by students dealing with the origins, and application of specific high-level philosophies that have been found useful in industry for designing and integrating work organisation, such as Set-up Time Reduction Techniques - SMED, WCM, TQM, Lean Manufacturing, Agile Manufacturing, Time-Based Competition, Theory of constraints TOC, SCM, as they emerge and take root in international production management practice.

PT4515 - AUTOMATION T 1
ECTS Credits: 6

**Design and Manufacturing Technology**

**Rationale and Purpose of the Module:** To introduce the student to motion systems and sensors applications in automation.
To introduce the student to basic process control
To introduce the student to indexing and feeding systems as used in manufacturing.
To Introduce the student to Programmable logic controller hardware and software.
To Introduce the student to the concepts of Robotics and cellular manufacture.

**Syllabus:**
Boolean Algebra, logic elements, counters, scalers and shift registers, basic circuitry, input-output signals.
Programmable logic controller hardware and software, applying programmable logic controllers to the control of manufacturing equipment. Field bus technology. Pneumatics pneumatic control, pneumatic circuit design, electro-pneumatics.

Hydraulics hydraulic control, hydraulic circuit design.
Interfacing Basic signal types A/D D/A conversion. Data transmission.
Sensors digital and analogue: proximity switches, photoelectric sensors, resistive, capacitive and inductive sensors, bar codes and vision systems.
Fault finding Standard Fault finding techniques.

**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, computer aided production and inventory control. To provide an understanding of the role of management accounting in the management process and familiarise students with the techniques used.
To investigate the high-level production control systems in an automated factory.

**Syllabus:**
The concept of integrated manufacturing systems.
MRP, CAPP, Group Technology, Classification and coding systems, Computer Aided production and inventory control. Integration of functional areas: MAP, TOP, EDI.
Coding and Classification - Definition - Application of Coding and Classification Systems
Process Planning - Definitions - Variant, Constructive and Generative Systems.
Shop Floor Systems and Manufacturing Execution Systems (MES) - Data Acquisition and Management - Bar Coding and Information Distribution and RFID.
Objectives, scope and framework of management accounting
Management accounting and organisation control
Cost accumulation for stock valuation and profit measurement
Product costing systems
Application of cost-volume-profit techniques
Marginal costing and non-routine decision making
Accounting information for pricing decisions.

**PY4011 - PHYSICAL EDUCATION CURRICULUM AND ASSESSMENT**
ECTS Credits: 6

**Physical Education & Sport Sciences**

**Rationale and Purpose of the Module:** The purpose of this module is for you to become familiar with curriculum and assessment and, in particular, within the (Irish) physical education context, informing what you believe is worth learning and worth assessing within physical education.

**Syllabus:** This module provides you with an opportunity to understand curriculum concepts and investigate the extent to which personal orientations and philosophies impact on curriculum. Along with your understanding of the physical education curriculum within the Irish school system, and what you believe is worth learning, you will be directed towards pursuing the use of particular curriculum/instruction models within your own teaching. Understanding assessment and its relationship to learning goals and learning experiences will allow you to determine what is worth assessing and how this can be done in a meaningful, relevant and effective way.

**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 indepth 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; lungs, pulmonary ventilation, and pulmonary gas exchange.

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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/specialising/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.

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PY4034 - PHYSIOTHERAPY IN CLINICAL NEUROLOGY
ECTS Credits: 6

Clinical Therapies

Rationale and Purpose of the Module: This module introduces students to the physiotherapy management of patients with neurological conditions. The lecture element of the module will consider pathologies and mechanisms of recovery, while the practical and tutorial sessions will focus on the analysis and facilitation of normal movement using peers and patient videos.


Prerequisites: PY4013

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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.

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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


Prerequisites: PY4022
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

PY4046 - PEDAGOGY OF DANCE / GYMNASTICS 2
ECTS Credits: 3

Physical Education & Sport Sciences

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.

Prerequisites: PY4601, PY4401

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 ð Aesthetic and Artistic distinctions?

PY4058 - APPLIED STUDIES IN ATHLETICS / OUTDOOR ADVENTURE EDUCATION
ECTS Credits: 6

Physical Education & Sport Sciences

Rationale and Purpose of the Module: Purpose of the Module
Students choose between either Athletics or Outdoor Adventure
Athletics
Designed to provide information and promote discussion on athletics issues while allowing students to explore athletics from both teaching and coaching perspectives.
Outdoor Adventure
Designed to prepare students to set up, teach, supervise, facilitate, and personally enjoy a variety of adventure and outdoor activities. This is a hands-on experience in which you will have the major responsibility for your own learning.

Syllabus: Athletics
Three distinct strands guide this module: theory, teaching, and coaching.
Outdoor Adventure
It is essential in outdoor adventure settings to be able to work collaboratively. With this in mind, you will be given opportunities to demonstrate your personal abilities in addition to your skills and skills to work in a team-oriented environment. Throughout the course, we will focus on both the science of good teaching and leadership (honing your delivery of information, planning lessons/events making decisions, and dealing with
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).

**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

**PY4072 - PEDAGOGY OF INVASION GAMES 1**
ECTS Credits: 3

**Physical Education & Sport Sciences**

**PY4094 - TEACHING AND LEARNING FOR INDIVIDUALS IN PHYSICAL EDUCATION**
ECTS Credits: 3

**Physical Education & Sport Sciences**

**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

**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

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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.

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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.

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SN4003 - SOCIAL SCIENCE 1, SOCIOLOGY OF HEALTH AND ILLNESS
ECTS Credits: 6

Nursing & Midwifery

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 healthcarers practice, social implications of contemporary healthcare policy.

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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 healthcare: crisis in welfare; crisis in health care; social implications of health care policy; changing context of health work.

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SO4001 - INTRODUCTION TO SOCIOLOGY
ECTS Credits: 6

Sociology

Rationale and Purpose of the Module: This module aims to introduce students to the subject matter of contemporary sociology. It will familiarise students with the key concepts used within sociological analysis and demonstrate, using illustrative materials, the uses and importance of sociological analysis in the modern and post-modern world.

Syllabus: An introduction to the sociological perspective
What is sociology and what do sociologists do?
The development of sociology
The sociological imagination
An introduction to sociological theory
Agency and Structure
Culture, Norms and Values
An introduction to structural functionalist theories
An introduction to conflict theories
An introduction to interaction theories
An introduction to feminist theory and post-modernism
An introduction to sociological research
The ethics of social research
The study of media fans will be discussed. Overall it is an explosion of new media in the context of globalisation, politics and the public sphere, the rise of 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.

Syllabus:

- Diasporic audiences.
- Audiences as fans.
- Media representations of class, ethnicity, gender and sexuality.
- Media audiences. Qualitative approaches towards understanding media audiences.
- Audiences as fans.
- Diasporic audiences.

SO4002 - GENDER: SOCIOLOGICAL PERSPECTIVES
ECTS Credits: 6

Sociology

Rationale and Purpose of the Module: The aim of this module is to introduce the students to sociological approaches to gender including the main theoretical frameworks in the study of gender and society.

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.

SO4008 - SOCIOLOGY OF MEDIA AUDIENCES
ECTS Credits: 6

Sociology

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.

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.

SO4033 - SOCIOLOGY OF MEDIA
ECTS Credits: 6

Sociology

Rationale and Purpose of the Module: This course aims to provide students with a critical understanding of the mass media from a sociological viewpoint. It will introduce students to key aspects of the debate amongst social scientists about the workings and influence of the media. The course is structured upon an examination of these key areas as well as presenting examples of the various methodological approaches used by sociologists in their analysis of the mass media.

Syllabus: * Sociology and the analysis of mass media.
* The production/content/reception model of media analysis.
* Applying sociological theories and methods in critically understanding the mass media.
* Media globalization.
* Globalization, aG-localization/E and Media Audiences.
* Media Ownership, concentration and conglomerations.
* The political economy perspective. The public sphere.
* Media production and media professionals.
* Structure and agency in a media setting.
* HallÆs 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.

SO4046 - QUANTITATIVE METHODS FOR SOCIOLOGICAL RESEARCH
ECTS Credits: 6

Sociology

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 and facility with quantitative research methods; particularly to develop their facility in the analysis of quantitative data. The primary objective of the course is to:

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;

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 and realism and constructivism, modernity and postmodernity.

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/postmodernity; theories of rationality (Rational Choice/Rational Action theory); and the theory of social practice (Bourdieu).
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.

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 emergent 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 ¿ 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.

ECTS Credits: 6
Sociology
Rationale and Purpose of the Module: To provide students with a theoretical framework for understanding the social, political and intellectual meanings of gender and multiculturalism in the Global North; to present feminist critiques of different approaches to multiculturalism; to familiarise students with the development of multiculturalism and its gendered effects within particular national and transnational contexts.

Syllabus: The syllabus will include theories that account for multiculturalism as a top-down response to cultural difference which produces a reification of `culture¿ and gender. It will also examine theories that identify multiculturalism as a new way forward to a `politics of recognition¿ and progressive gender politics. Examples of gendered cultural practices that raise critical questions for the effectiveness of multiculturalism, such as polygamy, forced marriage, female genital mutilation, unequal access to health care, education and rights of ownership will be examined. The course will consider how multiculturalism is reshaping the public spheres and civil societies of the West with particular implications for women and for gender relations. The module will be driven by questions relating to the relationships between gender, cultural diversity and global capitalism; how multicultural approaches to social cohesiveness reconceive belonging in gendered ways; and how gender relations affect and are affected by multicultural strategies for negotiating difference.

SO4118 - SOCIOLOGY OF GENDER AND POPULAR CULTURE
ECTS Credits: 6
Sociology
Rationale and Purpose of the Module: a. To provide an opportunity for the student to examine key theoretical perspectives relevant to the study of gender and popular culture
b. To offer ways of evaluating the work of major sociological schools/theorists in the study of popular culture and gender studies.
c. To develop the ability to analyse and interpret popular cultural texts through the lens of gender analysis.

Syllabus: This module explores the twin themes of bodies and sexualities in the spaces of contemporary
Western culture. Utilising a range of popular cultural forms, sites and events which are most accessible - television, cinema, magazines; households, shops and workplaces; and popular understandings of medicine, science and technology - the module involves students in a series of critical engagements. The module addresses a number of issues; why the subjects of sexualities and the body become the focus of so much interest across a broad range of disciplines; How we an de-naturalise and problematise normative gender categories by setting gendered identities in cultural contexts; What important contributions have been made to the field by recent work on masculinities; How the practices of everyday life can be interrogated to yield insights about the relationships between the body, gendered identities and prevailing cultural norms.

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 perspectives. 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; body building 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 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.

Prerequisites: SO4073, SO4001

SP4002 - INTRODUCTION TO LATIN AMERICAN CULTURE/S
ECTS Credits: 6

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 literacy boom of the 1960s, Magical Realism, and the importance of women’s artistic production.

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**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

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**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: SP4131

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**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.

**Prerequisites:** SP4133, SP4143, SP4134, SP4934

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**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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**SP4148 - MEDIA AND CURRENT ISSUES IN THE**
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/Es knowledge of the structures of Spanish grammar.
* Expand the student/Es range of Spanish vocabulary.
* Improve pronunciation and patterns of intonation in Spanish.
* Further develop the student/Es language skills by exposing them to different situation and registers, both formal and informal.
* Facilitate the student/Es understanding of various cultural aspects within the Spanish-speaking world.

Syllabus: Tutorials: 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: SP4241

SP4243, SP4233

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
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

**Syllabus:** The programme is centered around a variety of topics of relevance to students of Spain and Latin America. The intent 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:** 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:** Aims & Objectives: 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.

**SP4808 - SPANISH LANGUAGE AND LITERATURE 1**

**ECTS Credits:** 6

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

**Rationale and Purpose of the Module:** Aims and Objectives: 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.

**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.

**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 series 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 practise and improve 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:** SP4143
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 current 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.

**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.

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**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, group & 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 it role in the learning and performance of motor skills with implications for teaching. Some key mental skills (e.g. imagery, goal setting, controlled breathing).

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**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

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**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.

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**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 competency in measurement techniques.


**Prerequisites:** SS4202
SS4304 - INTRODUCTION TO BASIC BIOMECHANICS  
ECTS Credits: 6  
Physical Education & Sport Sciences  
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  

SS4312 - QUALITATIVE BIOMECHANICAL ANALYSIS  
ECTS Credits: 6  
Physical Education & Sport Sciences  
Rationale and Purpose of the Module: While a sound knowledge of anatomical structure is important for effective analysis of human movement activity - Analysis requires in-depth understanding of how forces act on joints and how joint structure affects movement. There is a need for the sport scientist and physical education specialist to develop effective skills qualitatively analyzing human movement, it causes and effects, through a synthesis of knowledge of anatomy and of basic mechanics. There is also a need to encourage the student to focus on the applied nature of anatomy and biomechanics in sport and physical education. An emphasis on applied nature of this knowledge to sports performance will be achieved through extensive practice in the application of deterministic models of performance, and examination of overall performance objectives, biomechanical factor and principles and critical features of performance in a wide range of sport and exercise activities. The emphasis on this module will be on developing the student's skill in analysing movement without direct measurement and developing the ability to recommend ways of improving performance or learning as an outcome of qualitative analysis.  
Syllabus: SYLLABUS  

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
first aid, all are aspects which are central to the effective prescription of exercise/physical activity for health and sport performance.

**Syllabus:** Exercise Prescription 2: Components of physical fitness. Principles of training specific to all components. Field tests for physical fitness. 


Prerequisites: SS4401

**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. cardiorespiratory 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

**TW4118 - Content Development and Information Management**
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 Residential 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


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 and 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
apply a range of design and processing skills in the context of the senior cycle Construction Studies (Architectural Technology) curriculum.

**Syllabus:** Pedagogic approaches to integrating design and manufacturing techniques and processes in senior cycle project work.
- Stages and functions of design.
- Model making and prototyping.
- Materials selection for sustainability.
- Material and process carbon footprint.
- Design and selection of wood and composite jointing techniques.
- Material optimisation.
- Design strategies.
- Programming and operation of CNC equipment.
- Data transfer from CAD systems.
- Analysis of the application of these technologies in the school.
- Production procedures.
- Organisation of work.
- Classroom/workshop/laboratory organisation.
- Fostering creativity in classroom activities.
- Assessment procedures and criteria.
- Presentation techniques.
- Design portfolios.

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**WT4017 - ENERGY EFFICIENT BUILDINGS**  
ECTS Credits: 6  

**Civil Engineering and Materials Science**

Background: Energy supply and demand, climate change, energy performance of buildings directive and Irish legislation, technical guidance documents Part-L Energy: Supply and demand considerations for domestic buildings (new and existing)
- Concepts of Temperature and Heat Energy: Concepts of conduction, convection and radiation; thermal bridging; heat energy and energy losses of materials; U-value; heat loss and heat gain; energy performance; thermodynamics and heat; energy balance; air flow and energy transfer.
- Electrical and Lighting Energy assessment: Principles of measurement from plans, surveys and drawings; electrical measurements; electrical devices and efficiency.
- Energy Efficiency, Energy Storage and Control: Fundamental principles; principles of energy storage; heat capacity; thermal mass; heat and water; temperature measurements and control; energy sources; energy conversions; fuel, combustion and CO2 emissions; greenhouse gases; carbon dioxide emission rating; solar energy; thermal mass; solar gains; solar collectors; efficiency adjustment factors; primary and secondary heating systems; single and immersion heaters; carbon dioxide emission rating.
- Building Energy Ratings in domestic buildings: Use of Dwelling Energy Assessment Procedures (DEAP) software for new and DEAP+ for existing buildings; generation of advisory reports.
- Introduction to BER in non-domestic buildings.
- Introduction to SBEM for new and existing non-domestic buildings.

**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 bend use of construction, particularly for humans using timber based constructions

**Syllabus:** Elements of timber frame construction: beam, truss, shear wall, stressed skin panel, ground floor wall, party wall, cladding, insulation, connectors.
- Methods of construction: system construction, proprietary products, site assembly
- Methods of design: truss, floor, wall, lateral resistance, multi-storey
- Methods of analysis: ECS, limit state design, self weight, wind, snow


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**WT4102 - WOOD SCIENCE 1**  
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.

**Syllabus:** Tree growth, production of woody tissue.
- [Silviculture] practice establishment, management, harvesting.
- [Macroscopic] nature of wood.
- [Microscopic] nature of wood, cell wall, hardwood, softwood.
- [Chemistry of wood], cellulos, lignin, extractions.
- [Factors affecting wood quality]:
  - [Chemical]: degradation
  - [Biological]: growth, wood variants, reaction, juvenile, bark, foreign organisms, fungi, insects, marine

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**WT4104 - WOOD SCIENCE 2**  
ECTS Credits: 6  

**Civil Engineering and Materials Science**

**Rationale and Purpose of the Module:** To develop an awareness in the student of the wood-moisture relationships, its effect and its control.
- To introduce the student to the effect that the prior life of the tree (species, silviculture, location) has on the conversion of the tree trunk material to seasoned/dimensioned wood

**Syllabus:** Wood:
- Moisture relationships in wood
- nature of moisture
- determination of moisture content
- equilibrium dynamics and shrinkage
- movement of water, capillarity, diffusion.
- Modification of wood-moisture relationship
  - air-drying and natural seasoning
  - steaming, re-moisturising, moisture gradient control
  - kiln drying, fundamentals of kiln-drying, defects, equilibrium
Civil Engineering and Materials Science

Rationale and Purpose of the Module: To integrate the combination of wood and its reconstruction into wood products, in terms of process, properties and end uses.

Syllabus: Concepts in modifying wood: deconstruction, combination, chemical and physical changes. Commination: fibres, pulping, mechanical, chemical, physical, chips, particles, veneer, sections.

Fibre Products:
- Papers manufacture, types, specification, modification, print requirements.
- Cardboard, specification, corrugation, packaging.
- Hardboard, insulation board.
- Medium and high density fibreboard, manufacture, types, properties, end uses.

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
- Heating and air conditioning services:
  - To develop the student critical thinking skills.
  - To empower the student with the skills necessary to undertake research.
  - To promote the importance of teamwork
  - To develop good aero/soft skills.

Syllabus: Learning styles & BloomEs taxonomy; basic engineering terminology and SI units; model building and testing; introduction to research methodologies via minor research projects broadly related to engineering and construction; projects involving individual presentations and team debates; Report writing on given engineering scenarios. Industry participation through invited speakers or industrial visits will be accommodated whenever practical.

WT4202 - DESIGN STUDIO
ECTS Credits: 6

Civil Engineering and Materials Science

Rationale and Purpose of the Module: To develop:
* To develop good æsoft skills.Æ
* To empower the student with the skills necessary to earn a standard qualification in Civil Engineering and Materials Science
* To develop the studentÆs critical thinking skills.
* To develop model building and testing exercises. The key objectives of this module are:
  * To develop studentÆEs critical thinking skills.
  * To empower the student with the skills necessary to undertake research.
  * To promote the importance of teamwork
  * To develop good aero/soft skills.

WT42005, WT4006, WT400S

WT4106 - ARCHITECTURAL TECHNOLOGY: MATERIALS TECHNOLOGY AND DESIGN
ECTS Credits: 6

Design and Manufacturing Technology

Rationale and Purpose of the Module: To develop:
- An ability to select or specify materials which are appropriately used and are environmentally friendly and sustainable.
- Pedagogical knowledge, skills, values and attitudes appropriate to the teaching of materials technology and design at second level


Prerequisites: WT4102

WT4107 - PULP, FIBRE AND BOARD MANUFACTURE
ECTS Credits: 6

Prerequisites: WT4102
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 addressing engineering, planning and Irish architectural heritage and conservation.

* Soil identification, properties and behaviour addressing drainage & foundation choice.

* Concrete technology and mix design.

* Environmental considerations in residential construction addressing 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

Civil Engineering and Materials Science

Rationale and Purpose of the Module: The aim of this module is to provide a comprehensive introduction to building services and associated technology:

Key objectives

* Introduction to active and passive building services in domestic construction.

* Understand design, build and operation implications of these services.

Syllabus:

* Heating ventilation and air conditioning services; district heating, heat loss calculations, thermal insulation, ventilation, air filters, heat recovery systems; principles of air conditioning, dual duct and convector air conditioning systems, DEAP.

* Hot and cold water supply services; low, medium and high pressure hot water heating.

* Drainage services; below ground drainage systems, pipe materials and pipe laying, soakaways, drain testing and inspection.
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 taping 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, reinforcement, precast elements; 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

Prerequisites: WT4607

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.

Prerequisites: PN4111

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.

Prerequisites: PH4032

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.


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Contact Study.Abroad@ul.ie with any module queries

More information is available at www.ul.ie