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 departmental way to distinguish between classes

The final digit is the only way to determine which semester it will run in.
1, 2, 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...

Modules featured in this Booklet

All modules are in alphabetical order by module code.

<table>
<thead>
<tr>
<th>Module</th>
<th>Faculty</th>
<th>Department</th>
</tr>
</thead>
<tbody>
<tr>
<td>AC</td>
<td>BUS</td>
<td>ACF</td>
</tr>
<tr>
<td>AR</td>
<td>SEN</td>
<td>ARC</td>
</tr>
<tr>
<td>BC</td>
<td>SEN</td>
<td>CES</td>
</tr>
<tr>
<td>BY</td>
<td>SEN</td>
<td>LSC</td>
</tr>
<tr>
<td>CE</td>
<td>SEN</td>
<td>CES</td>
</tr>
<tr>
<td>CG</td>
<td>SEN</td>
<td>CES</td>
</tr>
<tr>
<td>CH</td>
<td>SEN</td>
<td>CES</td>
</tr>
<tr>
<td>CM</td>
<td>BUS</td>
<td>MMA</td>
</tr>
<tr>
<td>CS</td>
<td>SEN</td>
<td>CSI</td>
</tr>
<tr>
<td>CU</td>
<td>AHS</td>
<td>MLA</td>
</tr>
<tr>
<td>DM</td>
<td>SEN</td>
<td>DMT</td>
</tr>
<tr>
<td>EC</td>
<td>BUS</td>
<td>ECO</td>
</tr>
<tr>
<td>ED</td>
<td>SEN</td>
<td>EDE</td>
</tr>
<tr>
<td>EE</td>
<td>SEN</td>
<td>ECE</td>
</tr>
<tr>
<td>EH</td>
<td>AHS</td>
<td>COO</td>
</tr>
<tr>
<td>EN</td>
<td>EHS</td>
<td>EPS</td>
</tr>
<tr>
<td>EP</td>
<td>BUS</td>
<td>MMA</td>
</tr>
<tr>
<td>EQ</td>
<td>SEN</td>
<td>LSC</td>
</tr>
<tr>
<td>ER</td>
<td>SEN</td>
<td>CES</td>
</tr>
<tr>
<td>ET</td>
<td>SEN</td>
<td>EDE</td>
</tr>
<tr>
<td>EV</td>
<td>SEN</td>
<td>LSC</td>
</tr>
<tr>
<td>FI</td>
<td>BUS</td>
<td>ACF</td>
</tr>
<tr>
<td>FR</td>
<td>AHS</td>
<td>MLA</td>
</tr>
<tr>
<td>FT</td>
<td>SEN</td>
<td>LSC</td>
</tr>
<tr>
<td>GA</td>
<td>AHS</td>
<td>COO</td>
</tr>
<tr>
<td>GE</td>
<td>AHS</td>
<td>MLA</td>
</tr>
<tr>
<td>HI</td>
<td>AHS</td>
<td>HIS</td>
</tr>
<tr>
<td>HS</td>
<td>SEN</td>
<td>CES</td>
</tr>
<tr>
<td>IN</td>
<td>BUS</td>
<td>ACF</td>
</tr>
<tr>
<td>JA</td>
<td>AHS</td>
<td>MLA</td>
</tr>
<tr>
<td>JM</td>
<td>AHS</td>
<td>COO</td>
</tr>
<tr>
<td>LA</td>
<td>AHS</td>
<td>LAW</td>
</tr>
<tr>
<td>LI</td>
<td>AHS</td>
<td>MLA</td>
</tr>
<tr>
<td>LP</td>
<td>AHS</td>
<td>LAW</td>
</tr>
<tr>
<td>LS</td>
<td>SEN</td>
<td>LSC</td>
</tr>
<tr>
<td>MA</td>
<td>SEN</td>
<td>MAS</td>
</tr>
<tr>
<td>MB</td>
<td>SEN</td>
<td>MAS</td>
</tr>
<tr>
<td>MD</td>
<td>HUM</td>
<td>HUM</td>
</tr>
<tr>
<td>ME</td>
<td>SEN</td>
<td>MAB</td>
</tr>
<tr>
<td>MF</td>
<td>SEN</td>
<td>DMT</td>
</tr>
<tr>
<td>MG</td>
<td>BUS</td>
<td>MMA</td>
</tr>
<tr>
<td>MN</td>
<td>BUS</td>
<td>MMA</td>
</tr>
<tr>
<td>MS</td>
<td>SEN</td>
<td>MAS</td>
</tr>
<tr>
<td>MT</td>
<td>SEN</td>
<td>CEM</td>
</tr>
<tr>
<td>MU</td>
<td>HUM</td>
<td>HUM</td>
</tr>
<tr>
<td>NS</td>
<td>EHS</td>
<td>NMI</td>
</tr>
<tr>
<td>PA</td>
<td>AHS</td>
<td>PPA</td>
</tr>
<tr>
<td>PD</td>
<td>SEN</td>
<td>DMT</td>
</tr>
<tr>
<td>PH</td>
<td>SEN</td>
<td>PHE</td>
</tr>
<tr>
<td>PM</td>
<td>BUS</td>
<td>PER</td>
</tr>
<tr>
<td>PO</td>
<td>AHS</td>
<td>PPA</td>
</tr>
<tr>
<td>PS</td>
<td>EHS</td>
<td>PSY</td>
</tr>
<tr>
<td>PT</td>
<td>SEN</td>
<td>DMT</td>
</tr>
<tr>
<td>PY</td>
<td>EHS</td>
<td>PES</td>
</tr>
<tr>
<td>RM</td>
<td>AHS</td>
<td>SOC</td>
</tr>
<tr>
<td>SN</td>
<td>EHS</td>
<td>NMI</td>
</tr>
<tr>
<td>SO</td>
<td>AHS</td>
<td>SOC</td>
</tr>
<tr>
<td>SP</td>
<td>AHS</td>
<td>MLA</td>
</tr>
<tr>
<td>SS</td>
<td>EHS</td>
<td>PES</td>
</tr>
<tr>
<td>TE</td>
<td>AHS</td>
<td>MLA</td>
</tr>
<tr>
<td>TW</td>
<td>AHS</td>
<td>CCO</td>
</tr>
<tr>
<td>TX</td>
<td>BUS</td>
<td>ACF</td>
</tr>
<tr>
<td>WT</td>
<td>SEN</td>
<td>CEM</td>
</tr>
</tbody>
</table>

*Only open to Journalism Majors

Faculty Key

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

Disclaimer

The content of this booklet is for information purposes only and should not be viewed as the basis of a contract between the student and the University of Limerick. No guarantee is given that modules may not be altered, cancelled or otherwise amended at any time.
<table>
<thead>
<tr>
<th>Module code</th>
<th>Academic area</th>
<th>Department</th>
</tr>
</thead>
<tbody>
<tr>
<td>AC</td>
<td>Accounting</td>
<td>Accounting and Finance</td>
</tr>
<tr>
<td>AR</td>
<td>Architecture</td>
<td>School of Design</td>
</tr>
<tr>
<td>BC</td>
<td>Biochemistry</td>
<td>Chemical Sciences</td>
</tr>
<tr>
<td>BR</td>
<td>Broadening modules</td>
<td>N/A</td>
</tr>
<tr>
<td>BY</td>
<td>Biology</td>
<td>Biological Sciences</td>
</tr>
<tr>
<td>CE</td>
<td>Computer Engineering</td>
<td>School of Engineering</td>
</tr>
<tr>
<td>CG</td>
<td>Chemical Sciences</td>
<td>Chemical Sciences</td>
</tr>
<tr>
<td>CH</td>
<td>Chemistry</td>
<td>Chemical Sciences</td>
</tr>
<tr>
<td>CS</td>
<td>Computer Software</td>
<td>Computer Science and Information Systems</td>
</tr>
<tr>
<td>CU</td>
<td>Cultural Studies</td>
<td>School of Modern Languages and Applied Linguistics</td>
</tr>
<tr>
<td>DM</td>
<td>Design &amp; Manufacturing</td>
<td>School of Engineering</td>
</tr>
<tr>
<td>EC</td>
<td>Economics</td>
<td>Economics</td>
</tr>
<tr>
<td>ED</td>
<td>Electrical Distribution</td>
<td>Electronic and Computer Engineering</td>
</tr>
<tr>
<td>EE</td>
<td>Electronic Engineering</td>
<td>Electronic and Computer Engineering</td>
</tr>
<tr>
<td>EH</td>
<td>English studies</td>
<td>School of Culture and Communications</td>
</tr>
<tr>
<td>EN</td>
<td>Education</td>
<td>School of Education</td>
</tr>
<tr>
<td>EP</td>
<td>Entrepreneurship</td>
<td>Management and Marketing</td>
</tr>
<tr>
<td>EQ</td>
<td>Equine Science</td>
<td>Biological Sciences</td>
</tr>
<tr>
<td>ER</td>
<td>Environmental Science</td>
<td>Chemical Sciences</td>
</tr>
<tr>
<td>ET</td>
<td>Electronic Technology</td>
<td>Electronic and Computer Engineering</td>
</tr>
<tr>
<td>EV</td>
<td>Equine Science</td>
<td>Biological Sciences</td>
</tr>
<tr>
<td>FI</td>
<td>Finance</td>
<td>Accounting and Finance</td>
</tr>
<tr>
<td>FR</td>
<td>French</td>
<td>School of Modern Languages and Applied Linguistics</td>
</tr>
<tr>
<td>FT</td>
<td>Food Technology</td>
<td>Biological Sciences</td>
</tr>
<tr>
<td>GA</td>
<td>Gaeilge</td>
<td>School of Culture and Communication</td>
</tr>
<tr>
<td>GE</td>
<td>German</td>
<td>School of Modern Languages and Applied Linguistics</td>
</tr>
<tr>
<td>HI</td>
<td>History</td>
<td>History</td>
</tr>
<tr>
<td>IN</td>
<td>Insurance</td>
<td>Accounting and Finance</td>
</tr>
<tr>
<td>Module code</td>
<td>Academic area</td>
<td>Department</td>
</tr>
<tr>
<td>------------</td>
<td>------------------------</td>
<td>-------------------------------------------------</td>
</tr>
<tr>
<td>JA</td>
<td>Japanese</td>
<td>School of Modern Languages and Applied Linguistics</td>
</tr>
<tr>
<td>JM</td>
<td>Journalism</td>
<td>School of Culture and Communication</td>
</tr>
<tr>
<td>LA</td>
<td>Law</td>
<td>Law</td>
</tr>
<tr>
<td>LI</td>
<td>Linguistics</td>
<td>School of Modern Languages and Applied Linguistics</td>
</tr>
<tr>
<td>MA</td>
<td>Mathematics</td>
<td>Mathematics and Statistics</td>
</tr>
<tr>
<td>MB</td>
<td>Mathematics</td>
<td>School of Education</td>
</tr>
<tr>
<td>MD</td>
<td>Music and Dance</td>
<td>Humanities</td>
</tr>
<tr>
<td>ME</td>
<td>Mechanical Engineering</td>
<td>School of Engineering</td>
</tr>
<tr>
<td>MF</td>
<td>Manufacturing</td>
<td>School of Engineering</td>
</tr>
<tr>
<td>MG</td>
<td>Management</td>
<td>Management and Marketing</td>
</tr>
<tr>
<td>MI</td>
<td>Management of Information</td>
<td>Management and Marketing</td>
</tr>
<tr>
<td>MK</td>
<td>Marketing</td>
<td>Management and Marketing</td>
</tr>
<tr>
<td>MS</td>
<td>Mathematics &amp; Statistics</td>
<td>Mathematics and Statistics</td>
</tr>
<tr>
<td>MT</td>
<td>Materials</td>
<td>School of Engineering</td>
</tr>
<tr>
<td>MU</td>
<td>Music</td>
<td>Humanities</td>
</tr>
<tr>
<td>NS</td>
<td>Nursing</td>
<td>Nursing and Midwifery</td>
</tr>
<tr>
<td>PA</td>
<td>Public Administration</td>
<td>Politics and Public Admin</td>
</tr>
<tr>
<td>PD</td>
<td>Product Design</td>
<td>School of Design</td>
</tr>
<tr>
<td>PH</td>
<td>Physics</td>
<td>Physics</td>
</tr>
<tr>
<td>PM</td>
<td>Personnel Management</td>
<td>Personnel and Employment Relations</td>
</tr>
<tr>
<td>PO</td>
<td>Politics</td>
<td>Politics and Public Admin</td>
</tr>
<tr>
<td>PS</td>
<td>Psychology</td>
<td>Psychology</td>
</tr>
<tr>
<td>PT</td>
<td>Production Tools</td>
<td>School of Engineering</td>
</tr>
<tr>
<td>PY</td>
<td>Physical Education</td>
<td>Physical Education and Sports Sciences</td>
</tr>
<tr>
<td>RE</td>
<td>Robotics Engineering</td>
<td>School of Engineering</td>
</tr>
<tr>
<td>RM</td>
<td>Research Methods</td>
<td>School of Culture and Communications</td>
</tr>
<tr>
<td>SN</td>
<td>Sociology / Nursing</td>
<td>Nursing and Midwifery</td>
</tr>
<tr>
<td>SO</td>
<td>Sociology</td>
<td>Sociology</td>
</tr>
<tr>
<td>Module code</td>
<td>Academic area</td>
<td>Department</td>
</tr>
<tr>
<td>-------------</td>
<td>--------------------------------------</td>
<td>-----------------------------------------------------</td>
</tr>
<tr>
<td>SP</td>
<td>Spanish</td>
<td>School of Modern Languages and Applied Linguistics</td>
</tr>
<tr>
<td>SS</td>
<td>Sport Sciences</td>
<td>Physical Education and Sports Sciences</td>
</tr>
<tr>
<td>TE</td>
<td>English as a Foreign Language</td>
<td>School of Modern Languages and Applied Linguistics</td>
</tr>
<tr>
<td>TW</td>
<td>Technical Writing</td>
<td>School of Culture and Communications</td>
</tr>
<tr>
<td>TX</td>
<td>Taxation</td>
<td>Accounting and Finance</td>
</tr>
<tr>
<td>WT</td>
<td>Wood Technology</td>
<td>School of Engineering</td>
</tr>
</tbody>
</table>
AC4001 - PRINCIPLES OF ACCOUNTING  
ECTS Credits: 6  

Accounting & Finance  

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

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

Prerequisites: none

AC4007 - ADVANCED FINANCIAL REPORTING  
ECTS Credits: 6  

Accounting & Finance  

Rationale and Purpose of the Module: The aim of this module is to develop a student’s understanding of the theory and practice of selected international accounting standards. It encourages the student to critically evaluate selected accounting standards in light of their historical development and regulatory context.

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

Prerequisites: AC4001

AC4213 - FINANCIAL ACCOUNTING  
ECTS Credits: 6  

Accounting & Finance  

Rationale and Purpose of the Module: The purpose of the module is to equip students with an understanding of the context of financial accounting in the business environment, and to provide fundamental accounting capabilities.

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

Syllabus: The purpose of the module is to equip students with a high knowledge of financial accounting in the business environment. Students will obtain an understanding of fundamental accounting capabilities through teamwork, group discussions and assignments. The syllabus covers the following areas:

- Basic accounting principles/definitions, fundamental concepts and valuation bases.
- The regulatory framework of accounting including the role and objectives of the International Accounting Standards Board; the purpose of accounting standards and the standard-setting process.
- The accountant’s role in the preparation and reporting process (including possible ethical issues that may arise and the need for a professional and responsible approach to their actions and decisions at work).
- Books of prime entry and the nominal ledger (including the principles of double-entry accounting and the recording of transactions resulting in income, expenses, assets, liabilities and equity).
- Control accounts and the trial balance (including identifying and correcting errors in accounting records and financial statements; preparing Cash book and bank reconciliations).
- The preparation of sole trader accounts including a statement of comprehensive income, statement of financial position and statement of cash flow.

Prerequisites: none

AC4305 - FINANCIAL INFORMATION ANALYSIS  
ECTS Credits: 6  

Accounting & Finance  

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

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

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

Accounting & Finance

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

Syllabus: Objectives, scope and framework of management accounting; role and purpose of management accounting; management accounting and the business environment; ethical guidelines and challenges; cost terminology, concepts and classification; cost accumulation for inventory valuation and profit challenges; cost terminology, concepts and classification; management accounting; management accounting and the associated theoretical and empirical research activity.

Syllabus: Personal Portfolio Development, Constructing a portfolio of experiences in projects using a combination of different digital fabrication technologies.

AR4001 - DESIGN STUDIO 1A
ECTS Credits: 15

School of Design

Rationale and Purpose of the Module: The module supports the work of students in translating their study of their own practice into a portfolio of work reflecting their development and achievements in the programme.

Syllabus: Personal Portfolio Development, Constructing a portfolio of experiences in projects using a combination of different digital fabrication technologies.

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

By working through the project, the student will become exposed to the architectural design process, a new and complex process for 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. The studio is co-ordinated with the content of parallel course modules and integration between studio work and course modules is a vital and innovative component of the studio structure.

AR4005 - DESIGN STUDIO 3A
ECTS Credits: 15

School of Design

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

Syllabus: An agenda will be set in Design Studio. The basis for all propositions will have stated intent relative to societal ideas of place, collectivity and socio economic (or political) meaning. The architectural project brief will have inherent complexity, embodying personal space together with public space. Through the detailed study of architectural references, a concept of now relative to the past history of societal and architectural ideas will inform each students
propagation since both will be researched and presented in parallel. The material realisation of these social and cultural concepts is capable of conveying meaning in a contribution that the strictly functional provision of buildings does not make. The architectural proposition will move through a series of studies where the student is taught to use different scales, modes of operation and reference points. The emphasis will be on the mastery of investigative skills through a range of media on an ongoing basis. 

Prerequisites: AR4004

AR4007 - DESIGN STUDIO 4A
ECTS Credits: 18

School of Design

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

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

AR4011 - GRAVITY AND REACTION 1
ECTS Credits: 3

School of Design

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

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

AR4013 - GRAVITY AND REACTION 3
ECTS Credits: 3

School of Design

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

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

Prerequisites: AR4014

AR4015 - GRAVITY AND REACTION 5
ECTS Credits: 3

School of Design

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

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

Prerequisites: AR4014

AR4021 - REPRESENTATION / DRAWING 1
ECTS Credits: 3

School of Design

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

Studio based exercises with weekly changing subjects introducing key aspects of architectural vocabulary (light and space, site, human scale, skin and comfort, flows and organisation, vision and architecture).

(b)* Materials in structural design and their relevant components
(c) Failure modes in slab, trusses, beams, shells and membranes.

Prerequisites: AR4004
introducing lectures are followed by a drawing or sketching exercise, and, in the next step by a model making exercise, where the drawings from the exercise have to be interpreted and transformed into the 3rd dimension. Contents of both exercises as well as the chosen format, materials and techniques are directly related to the particular subject. As subject matter, each session will be organized around a specific theme from art, photography, film, dance, architecture

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

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

AR4023 - REPRESENTATION / DRAWING 3
ECTS Credits: 3

School of Design

Rationale and Purpose of the Module: In this module students hone skills in drawing through practising, and form an understanding through application.

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: AR4022

---------------------

AR4025 - REPRESENTATION / DRAWING 5
ECTS Credits: 3

School of Design

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

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

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

Prerequisites: AR4024

---------------------

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

School of Design

Rationale and Purpose of the Module: The first year program in History-Theory aims to expand students horizons of knowledge about architecture while teaching foundational skills in reading and writing in the discipline. Even though students at the School of Architecture are expected to be highly literate and articulate, entering into a new field 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 a selection of the monuments of modern architecture together with contemporary ways of thinking about the field.

Syllabus: The theme for the fall workshop is Site.

AR4033 - HISTORY AND THEORY OF ARCHITECTURE 3
ECTS Credits: 3

School of Design

Rationale and Purpose of the Module: The second year program in Architectural Research provides students with a comprehensive survey of the history of architecture and urbanism. Students will continue to hone the specific cognitive skills required to address the field, deepening their knowledge of the local and global built domain while reading, writing, and researching architecture. The goal is to provide students with a basic knowledge and understanding of architecture and urban design in the period between circa 1851 and 1980. In addition, the course is designed to teach students how to critically analyze and evaluate built projects from a variety of perspectives, and how to communicate these
SYLLABUS: The first part of the course deals with ways of looking at the history of land and society; people, time, place (methodological with material from the Mediterranean, Ireland and Limerick). It will include several Case Studies: Irish building land 1600-2000 (ownership, tenure, land reform, rural and urban populations), building the city; Limerick 1200-2000 (racial, social and religious segregation over time), and deal with the shape of the city: (Medieval, Renaissance, Baroque and Industrial ideals of the city, with emphasis on land use in relation to buildings and spaces between buildings, building land in Ireland today; not about the law but about trends, patterns, densities.

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

PREREQUISITES: AR4032

---------------------------

AR4035 - HISTORY AND THEORY OF ARCHITECTURE 5
ECTS Credits: 3

School of Design

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

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

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

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

PREREQUISITES: AR4034

---------------------------

AR4043 - ASSEMBLY AND TECHNIQUES 3
ECTS Credits: 3

School of Design

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

SYLLABUS: Principles of assembly of buildings will be studied beginning through a raw material and a particular building typology. The focus will be on concrete, timber and steel construction. Practical reflections will be presented next to theoretical ones. Sober detail drawings will be introduced alongside thoughtful reflections. Basic construction concepts will be presented next to specific descriptions of construction processes.

DRAWING EXERCISE: Each exercise will involve disseminating the required information the previous week. A short introduction will precede each exercise.
LECTURE COURSE: A weekly lecture as well as visiting guest tutors will introduce students to properties of materials, covering descriptions of manufacturing methods, assembly and product ranges of the most important modern building materials.
DIARY OF A BUILDING: Students will be asked to keep a diary of progress on each site that will involve sketches, notes and photographs. Each group will be asked to present their findings to the class at the end of the year.
CASE STUDY: A building precedent will be presented to each student under the headings of concept, process and system.

PREREQUISITES: AR4042

---------------------------

AR4041 - ASSEMBLY AND TECHNIQUES 1
ECTS Credits: 3

School of Design

Rationale and Purpose of the Module: Introduction to Principles of Construction. Introduction to Construction Industry

SYLLABUS: This course will introduce basic constructional principals through the detailed study of elements of simpler constructional technology. This technology is considered from the point of view of design intent, logic of assembly and the quality of the resulting climate/environment.

The course will further challenge the students to analyse the built environment they are familiar with under these themes. The suitability of various forms of construction to different design ambitions will be considered with particular emphasis put on developing an understanding of the size and dimensions of various constructional systems. The course is intended as a foundation course in itself as well as anticipating the information required in the design studio. The course is seminar based with an individual student research component.

PREREQUISITES: AR4034

---------------------------

AR4032
AR4045 - ASSEMBLY AND TECHNIQUES 4  
ECTS Credits: 3

School of Design

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

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

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.

Prerequisites: AR4043

AR4051 - ENVIRONMENTAL SYSTEMS AND FORCES 1  
ECTS Credits: 3

School of Design

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

Syllabus: Sustainable development is a base for the future of human society on our planet. Architects as the designer for the built environment have a key position in this approach. Therefore a basic understanding of the physical backgrounds and interconnections is necessary. This lecture content spans from global to local and micro-climate, to energy and its different forms and sources towards materials and their properties. Parallel and interconnected to the teaching of design basics like space, light, boundaries students will learn the physical backgrounds and properties by handling and personal experiences. Burning 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: AR4052

AR4056 - ENVIRONMENTAL SYSTEMS AND FORCES 5  
ECTS Credits: 3

School of Design

Rationale and Purpose of the Module: Sustainable development is a base for the future of human society on our planet. Therefore a basic understanding of the physical backgrounds and interconnections is necessary. This modules content spans from global to local and micro-climate, to energy and its different forms and sources towards materials and their properties.

Syllabus: Understanding precisely how the performance of an integrated and unrelated set of elements will perform in a specific environment comes through simulation, modelling and analysis. Both analogue and digital means of simulation will be taught. Daylight modelling, building fabric U-value calculations, air-tightness, and CFD modelling of buildings are some examples of the types of essential simulation during the design process. The emphasis of the course is on the acquiring analytical techniques and skills required to evaluate the environmental performance of a set of elements under a specific condition.

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

The following subjects will be covered:

Day-lighting and artificial lighting design in relation to a large-scale physical model
Thermal energy losses and gains through envelope
Performance of a building in relation to air movement inside and outside (applied CFD modelling tools)
Material selection and embodied energy considerations

Prerequisites: AR4054
School of Design

AR4073 - DESIGN STUDIO 2A
ECTS Credits: 15

Rationale and Purpose of the Module:

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

Prerequisites: AR4002

AR4317 - Advanced Construction 1
ECTS Credits: 3

School of Design

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

Syllabus: The series of modules in Advanced Construction expands the scope of students competencies in building technologies and construction beyond traditional methods and their related familiar scale. In the final year, students engage in a tested dialogue with concerns of design, structure, environment, history and theory, representation, digital media, and other related areas and interests. Staff and student undertake in-depth research into specialist areas of technology. Case studies focus on an integration of structural and environmental systems in response to specific conditions that require complex skills in analysis and/or design. The students are expected to apply findings from directed and independent research on advanced construction technologies to develop each students thesis proposal individually.

AR4319 - Advanced Construction 3
ECTS Credits: 3

School of Design

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

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

Syllabus: Architecture electives provide a flexible framework to accommodate (short-term) research projects on a wide spectrum of issues, and to allow students to pursue their own personal interests within
This elective provides the theoretical framework, tool expertise and technical skills required to analyse, understand and represent three-dimensional complex forms (curves, surfaces and volumes) using digital tools. NURBS-based modelling tools and physically correct rendering tools are taught and applied in the process, specifically Rhino and Maxwell Render. The course will also present a number of techniques for sketching complex forms using pencil. The course also analyses prototyping and fabrication processes related to these complex forms, and students will study outstanding references of their application in contemporary design.

AS2391 - MANUFACTURING TECHNOLOGY AND CAD
ECTS Credits: 6

School of Engineering

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

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

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

School of Modern Languages and Applied Linguistics

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

This module is intended to assist international students undertaking PG Programmes with the aim of enabling students to adapt better to their new learning environment. In order to ensure that the transition from their home system to UL is as smooth as possible and the student’s maximum academic and social potential is met, this module aims to:
* Equip International students with the practical skills necessary to succeed in UL.
* Equip International students to become critical thinkers and researchers.
* Equip International students with the written and oral communication skills necessary to participate effectively in the academic community.
* Encourage students to become autonomous/independent learners.
* Enhance the learning experience of students.

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

Proposed Content: 1 x 12 hour Pre-Sessional Block
- Session 1: Academic Support Systems and Cultures
- Session 2: Information Sourcing
- Session 3: Information Management
- Session 4: Academic Protocols (Plagiarism)
- Session 5: How to Become a Successful Learner

BC4803 - MICROBIAL TECHNOLOGY 1A
ECTS Credits: 6

Chemical Sciences

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


Prerequisites: BY4001

BC4825 - MICROBIAL TECHNOLOGY 2
ECTS Credits: 6

Chemical Sciences

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

industrial/food applications. Viruses: general characteristics.

Prerequisites: BC4803, BY4001

BC4903 - BIOMOLECULES
ECTS Credits: 6

Chemical Sciences

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


Prerequisites: BC4903, BC4904

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

Chemical Sciences

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


Prerequisites: BC4904, BC4905

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

Politics and Public Admin

ACADEMIC CONTENT IS NOT CURRENTLY AVAILABLE FOR THIS MODULE - UPDATES ARE IN PROGRESS

BR4901 - BROADENING: BEGINNERS JAPANESE
ECTS Credits: 6

School of Modern Languages and Applied Linguistics

Rationale and Purpose of the Module: In line with the UL strategy to broaden the curriculum, this module will offer students in a range of different disciplines an opportunity to engage in learning Japanese. In our increasingly multicultural and multilingual society, it is crucial that students have opportunities to learn about and appreciate other languages and cultures. To this end, the module aims at developing students' competence in Japanese and is targeted at those who have not studied Japanese previously. The emphasis is on achieving a basic level of communication in all four skills (listening, speaking, reading and writing) while developing confidence and a degree of accuracy when using the language in a limited range of situations. The module also aims to stimulate students' interest in Japan and deepen their knowledge and understanding of Japanese society and culture.

Syllabus: This module aims to introduce students to Japanese and gradually develop their ability to function at beginners’ level. Students should develop a basic understanding of everyday vocabulary, understand the rules of pronunciation and have a basic grasp of the relevant grammar for that level. The module will allow students gain sufficient proficiency in Japanese to:

• recognize numbers, times, days, dates, where things are, greetings and questions;
• speak using greetings, expressions of time, price, number, place, talk about themselves, their likes, dislikes, pastimes and schedules, and ask basic questions;
BR4911 - BROADENING: BEGINNERS FRENCH  
ECTS Credits: 6

School of Modern Languages and Applied Linguistics

Rationale and Purpose of the Module: In line with the UL strategy to broaden the curriculum, this module will offer students in a range of different disciplines an opportunity to engage in learning French. In an increasingly multicultural and multilingual society, it is crucial that students have opportunities to learn about and appreciate other languages and cultures. To this end, the module aims at developing students' competence in French and is targeted at those who have not studied French previously. The module is mapped on to the A1 level of the Common European Framework for Languages where the emphasis is on achieving a basic level of communication in all four skills (listening, speaking, reading and writing). It will also aim at developing confidence and a degree of accuracy when using the language in a limited range of situations. The module also aims to stimulate students' interest in the French-speaking world and deepen their knowledge and understanding of French society and culture.

Syllabus: This module aims to introduce students to French and gradually develop their ability to the level of A1 as outlined by the Common European Framework for Languages. Students should develop a basic understanding of everyday vocabulary, understand the rules of pronunciation and have a basic grasp of the relevant grammar for that level. The module will allow students gain sufficient proficiency in French to:

- use a limited range of vocabulary to talk about particular concrete situations;
- use a small range of ready-made expressions and phrases related to everyday topics (introductions, leave-taking, apologies);
- write simple isolated phrases and sentences on everyday topics.

BR4921 - BROADENING: BEGINNERS GERMAN  
ECTS Credits: 6

School of Modern Languages and Applied Linguistics

Rationale and Purpose of the Module: In line with the UL strategy to broaden the curriculum, this module will offer students in a range of different disciplines an opportunity to engage in learning German. In an increasingly multicultural and multilingual society, it is crucial that students have opportunities to learn about and appreciate other languages and cultures. To this end, the module aims at developing students' competence in German and is targeted at those who have not studied German previously. The module is mapped on to the A1 level of the Common European Framework for Languages where the emphasis is on achieving a basic level of communication in all four skills (listening, speaking, reading and writing). It will also aim at developing confidence and a degree of accuracy when using the language in a limited range of situations. The module also aims to stimulate students' interest in the German-speaking world and deepen their knowledge and understanding of German society and culture.

Syllabus: This module aims to introduce students to German and gradually develop their ability to the level of A1 as outlined by the Common European Framework for Languages. Students should develop a basic understanding of everyday vocabulary, understand the rules of pronunciation and have a basic grasp of the relevant grammar for that level. The module will allow students gain sufficient proficiency in German to:

- use a limited range of vocabulary to talk about particular concrete situations;
- use a small range of ready-made expressions and phrases related to everyday topics (introductions, leave-taking, apologies);
- write simple isolated phrases and sentences on everyday topics.

BR4931 - BROADENING: BEGINNERS SPANISH  
ECTS Credits: 6

School of Modern Languages and Applied Linguistics

Rationale and Purpose of the Module: In line with the UL strategy to broaden the curriculum, this module will offer students in a range of different disciplines an opportunity to engage in learning Spanish. In an increasingly multicultural and multilingual society, it is crucial that students have opportunities to learn about and appreciate other languages and cultures. To this end, the module aims at developing students' competence in Spanish and is targeted at those who have not studied Spanish previously. The module is mapped on to the A1 level of the Common European Framework for Languages where the emphasis is on achieving a basic level of communication in all four skills (listening, speaking, reading and writing). The module also aims to develop confidence and a degree of accuracy when using the language in a limited range of situations. The module will stimulate students' interest in Spain and Latin America and deepen their knowledge and understanding of Spanish and Latin American society and culture.

Syllabus: This module aims to introduce students to Spanish and gradually develop their ability to the level of A1 as outlined by the Common European Framework for Languages. Students should develop a basic understanding of everyday vocabulary, understand the rules of pronunciation and have a basic grasp of the relevant grammar for that level. The module will allow students gain sufficient proficiency in Spanish to:

- use a small range of ready-made expressions and phrases related to everyday topics (introductions, leave-taking, apologies);
- write simple isolated phrases and sentences on everyday topics.
Introduction to biology, characteristics of life, and relationships - the Protozoans, the Poriferans and Placozoans, Introduction to the hydrostatic skeleton, the Nematodes, the Echinoderms; An overview of Molluscs, the Annelids and Sipunculans, the Arthropods, Cnidarians, the Platyhelminthes, the Nemertines, the Placozoans, Introduction to the hydrostatic skeleton, the Nematodes, the Echinoderms; An overview of Branding; international management strategy.

Management and Marketing

**Rationale and Purpose of the Module:** This module aims to provide students with an understanding of the international dimensions of business. It provides students with a foundation in the theory and practice of businesses operating within a globalised context. The module introduces students to the extensive remit of international business activity and to key concepts concerning companies operating internationally.

**Syllabus:** The course will introduce topics concerning international business while illustrating its scope and importance. Topics will include the impact of geography, culture and politics on business dealings. Students will study formal institutions (economic and political) and informal factors such as culture, religion, language and ethics. Other topics may include: globalisation; international trade; corporate social responsibility; global ethics. Other topics may include: globalisation; international trade; corporate social responsibility; global ethics. Students will study formal institutions (economic and political) and informal factors such as culture, religion, language and ethics. Other topics may include: globalisation; international trade; corporate social responsibility; global ethics.

**BY4001 - BIOLOGY 1**

**ECTS Credits:** 6

**Biological Sciences**

**Rationale and Purpose of the Module:** To introduce fundamental concepts of biological structure and function. To provide an introductory course in cellular energetics and respiration, photosynthesis, animal physiology, and microbiology.

**Syllabus:** Introduction to biology, characteristics of life, scientific methodology, biomolecules, chemistry of the cell and organism, cell structure and function, membrane structure and function. Cellular energy and metabolism, enzymes and enzyme reactions, cellular respiration; photosynthesis. Introduction to micro-organisms, microbiology, prokaryotic and eukaryotic organisms. Plant structure and function; transport in plants, reproduction, seed structure, germination, growth and development, plant adaptations. Principles and scope of ecology; ecosystems; cycles in nature; energy flows; population and community dynamics; limiting factors; food chains: succession, environmental concerns.

**BY4015 - PLANT PHYSIOLOGY**

**ECTS Credits:** 6

**Biological Sciences**

**Rationale and Purpose of the Module:** To introduce the students to the principles and applications of plant physiology.


**Prerequisites:** BY4002

**BY4025 - CROP AND GRASSLAND SCIENCE**

**ECTS Credits:** 6

**Biological Sciences**

**Rationale and Purpose of the Module:** To provide a practical introduction to crop and grassland science.

**Syllabus:** The course is delivered as a series of lectures covering the following topics:

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

**Assessment:** The importance of animal diversity to biological sciences and the environment.
Based on multiple choice questions and essay style practical laboratory write ups, and an end of term exam.

Area 5: Nutrition

BY4204 - PRINCIPLES OF HUMAN PHYSIOLOGY
ECTS Credits: 6

Biological Sciences

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

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

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

Prerequisites: BY4002, BY4001

BY4215 - SOIL SCIENCE
ECTS Credits: 6

Biological Sciences

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


Context and principles of water management
Factors in soil formation, soil formation in Ireland, soil profiles and horizons, classification and mapping of Irish soils, Great soil groups, series and types, Great soil groups found in Ireland, County soil maps, soils and land use. Functions of compost, compost materials and growth substrates, making an organic compost. Nutrient requirements and deficiencies in horticultural plants & use of artificial and organic fertilisers.

Laboratory:

Preparing a compost for seeds and a blocking compost
Preparing a compost for actively growing plants
Preparing cuttings composts
pump stations, surge tanks) and water / wastewater collection systems (manholes, combined sewer overflows, siphons, pumping stations, attenuation tanks); pipeline construction techniques and their application for specific site and ground conditions; development and use of simple numerical analysis tools for the design and sensitivity analysis of hydraulic systems; analysis and design of water storage and distribution systems, including flow demand, storage requirements, flow pressure and control; analysis and design of surface / wastewater collection systems, including assessment of hydraulic loads, network capacity, flow velocity, sediment transport, design & application of hydraulic structures; hydraulic design of treatment plants; hydraulic profiles; long term economic and sustainability design and operation of hydraulic systems.

---

**CE4014 - HYDRAULICS AND WATER ENGINEERING**  
**ECTS Credits:** 6

**School of Engineering**

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

**Syllabus:** Hydrology: The hydrological cycle; Water balance equation; Hydrologic Budgets; Precipitation: intensity, duration & return periods; Surface run-off and drainage systems; Sustainable urban drainage systems, flow attenuation, Aquifers; Groundwater flow; Measurement and monitoring of stream flow and groundwater; Hydrograph generation run-off, unit, synthetic; Channel Storage; Mass diagrams; Routing flood, reservoir & channel. Water Treatment: Characteristics of water; Water demand rates and peak flows; Distribution systems and service reservoirs; Physical treatment - screening, sedimentation; Clarification and settlement; Filtration with granular media and mechanical; Biological oxidation; Aerobic oxidation plants; Chemical treatment - coagulation, flocculation; Disinfection chloride, 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.

---

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

**School of Engineering**

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

**Key objectives**
- To master the concepts of critical state theory.
- Introduce a simple constitutive soil model û Cam clay.
- To generate enthusiasm for the subject through field trips, practical experimentation and case histories.

**Syllabus:**
- Basic mechanics
  - Stresses, strains; plane, axial symmetry, 2-D and 3-D conditions; stress ratio and dilation; slip surfaces; analysis of stress and strain of Mohrs circle; essentials of material behaviour; Stress-strain behaviour, stiffness and strength; Choice of parameters for stress and strain; Constitutive equations; Time & rate effects
- Laboratory testing of soils
  - Standard tests, purposes and specification; Shear box, triaxial and oedometer tests; Interpretation û OCR
- Consolidation
  - Basic mechanisms of consolidation and 1-D consolidation theory; Solutions and applications for 1-D consolidation; Determination of cv, cc and cs from oedometer tests; Calculation of foundation settlement
- Critical state strength of soil
  - Soil behaviour in shear; Peak, ultimate and residual strengths; Critical states; Undrained strength; Estimation of critical state strength parameters from classification tests
- Cam clay model
  - Basic features of the cam clay model and its application in computer predictions of soil behaviour; State boundary surface; Yielding and hardening

**Prerequisites:** CE4003

---

**CE4025 - TRANSPORT PLANNING AND DESIGN**  
**ECTS Credits:** 6

**School of Engineering**

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

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

---

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

**School of Engineering**

**Rationale and Purpose of the Module:** Module modified to reflect movement of more advanced topics from earlier structural engineering modules. This facilitates the advanced topics to be explored in greater depth in this module.

**Syllabus:** Structural scheme design of specialist structures - examples include grandstand, hospital, high-rise, long-span, reservoir, etc. Overall stability of structural schemes. Preliminary sizing of structural components in a variety of materials. Buiability of different structure types / components. Communication of concepts using hand sketches and oral presentations. Detailed design and detailing of structural components for a specialist structure therefore typically two of the following component types: pre-stressed and post-tensioned concrete; water retaining concrete; steel-concrete composite; steel plate- and box- girders; Long span components with stiffness critical design criteria.
CE4035 - REINFORCED CONCRETE AND MASONRY DESIGN
ECTS Credits: 6

School of Engineering

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

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

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

Design of unreinforced masonry subjected to vertical and lateral loading.

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

CE4045 - PROFESSIONAL PRACTICE 1
ECTS Credits: 6

School of Engineering

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

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

Syllabus:


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

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

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

School of Engineering

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

Syllabus:

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

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


CE4055 - REINFORCED CONCRETE DESIGN 1
ECTS Credits: 6

School of Engineering

ACADEMIC CONTENT IS NOT CURRENTLY AVAILABLE FOR THIS MODULE - UPDATES ARE IN PROGRESS

CE4607 - COMPUTER NETWORKS 1
ECTS Credits: 6

Electronic & Computer Engineering

Rationale and Purpose of the Module: This module provides a unified view of the field of computer communications and networks. The module seeks to integrate a number of topics introduced in earlier parts of the course and addresses the analysis, design and performance evaluation of data communication systems. The module covers communications within and between computer systems, and communications protocols and standards.

Syllabus: * [Introduction to Data and Computer Communications] Communications tasks; Protocol elements, characteristics, and functions; Protocol architectures; Reference communications models overview: OSI vs. TCP/IP (layers description and functions, PDU encapsulation).
* [Physical Transmission] Transmission modes (simplex, half duplex, full duplex) and transmission types (baseband, broadband); Analogue and digital signals; Transmission impairments (attenuation, delay distortion, noise); Channel capacity; Data encoding and modulation; Physical interfacing; Asynchronous & synchronous transmission; Transmission media; Multiplexing techniques (FDM, TDM, WDM).
* [Link-by-Link Communication] Line disciplines (ENQ/ACK, poll/select); Framing; Frame synchronization & data transparency, Flow control; Error control; Addressing; Link management; Protocol examples (character-oriented, byte-count, bit-oriented).
* [Network Services] Switching (circuit-, message-, packet switching); Addressing (classful vs. classless IP addressing); NAT operation (static and dynamic); IP subnetworking and supernetting; Routing (concepts and principles; routing algorithms & flooding, static, dynamic, central and distributed control; distance vector vs. link state routing; hierarchical routing; routing protocol examples: interior vs. exterior); Congestion control; QoS provision; IP protocol: main functions and operation (IPv4 vs. IPv6); Mobile IP; IP Address resolution with ARP and RARP; Internet multicasting (MBone operation) and group management (IGMP protocol); Control and assistance mechanisms (ICMP protocol: v4 vs. v6). Modular design of protocols.
* [Transport Services] Overview (connection-oriented vs. connectionless; segmentation and re-assembly); end-to-end delivery, flow control & buffering; crash recovery; Unreliable datagram transport with UDP; Reliable connection-oriented transport with TCP and SCTP; Reliable connection-oriented transport with TCP and SCTP; Modular design of protocols.
* [End-to-End Communication] Session management (SIP and SDP protocols); Data presentation (ASN.1 and NVT); Client-server communication model; Domain Name System (DNS); TCP/IP configuration: static (BOOTP protocol) vs. dynamic (DHCP protocol); Terminal networking with Telnet; File transfer with FTP and TFTP; E-mail service (SMTP, POP, IMAP protocols); Browsing with HTTP; Network management with SNMP.
* [Practical Implementation] Building and testing different types of patch cables; Serial interface configuration; Device configuration: JOS software, managing configuration files, updating software; Router configuration: initialisation, commands and modes of operation; Routing protocols configuration, operation and evaluation: RIP, IGRP etc.; Network configuration: testing established connectivity and routes. Analysing and interpreting IP addresses and subnets; Scaling the IP address space: CIDR, private addressing, secondary IP addressing, MTU and fragmentation; NAT configuration; TCP/IP protocols configuration and operation.

**Prerequisites:** EE4616

---

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

**Electronic & Computer Engineering**

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

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

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

---

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

**Electronic & 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


**Prerequisites:** CE4702

---

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

**Electronic & Computer Engineering**

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

**Syllabus:** The following will be covered:

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

**Prerequisites:** CE4704
CE4708 - ARTIFICIAL INTELLIGENCE
ECTS Credits: 6

Electronic & Computer Engineering

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

Syllabus: Section (i) - Introduction to Prolog and "Logic Programming"
Extra-logical features of Prolog.
Section (ii) - State-Space Search
Admissibility, Monotonicity, Informedness.
Section (iii) - Expert Systems
Section (iv) - Neural Networks

Prerequisites: CE4703

CG4001 - PROCESS ENGINEERING COMPUTATION METHODS
ECTS Credits: 6

Chemical Sciences


Prerequisites: EE4817

CG4003 - BIOPROCESS ENGINEERING 1
ECTS Credits: 6

Chemical Sciences

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

Syllabus: Application of the first and the second law of thermodynamics in chemical engineering: identify and describe open and closed systems; conditions and limitations for conversion between different kinds of energy; describe the theoretical energy conversion processes of Carnot-, Rankine- and Brayton, and understand the differences with their corresponding technical applications: steam turbines, gas turbines, cooling machines and heat pumps.

Fundamental thermodynamics of phase equilibria and methods of correlation and prediction: understand standard states and the use of activity and fugacity coefficients, understand the use and limitations of models for correlation and prediction of excess free energy and activity coefficients.
Application of chemical thermodynamics to reaction engineering: spontaneity of chemical reactions, chemical reaction equilibrium, equilibrium conversion calculations

Methods of correlation and prediction of physical properties for chemical engineering calculations. Availability and application of electronic data bases for physical properties, and software for prediction of physical properties.

CG4007 - SUSTAINABLE ENERGY PROCESSES
ECTS Credits: 6

Chemical Sciences

Rationale and Purpose of the Module: Provision of a process engineering module to give a deeper and wider knowledge in energy processes, with emphasis on sustainability and renewability.

Syllabus: Overview of energy conversion/generation processes fundamentals starting with combustion, elements of energy balance including heats of combustion, component balances, calorific values, excess air, efficiency and Carnot efficiency, and engineering solutions to maximize efficiency. This will lead to existing ideas for efficient energy generation (advanced generation) represented by Combined heat and power and Combined gas generation extended further to chemical energy generation represented by Fuel cells, Hydrogen production and Fuel re-synthesis. The novel energy conversion/generation ideas will be extended further to advanced nuclear power generation, represented by pebble-bed nuclear reactor. The knowledge of energy generation fundamentals will be enriched with the engineering principles of renewable energy generation, based on Solar, Geothermal, Biogas, Biomass, Wind and Ocean sources.

CG4017 - BIOPROCESS ENGINEERING 2
ECTS Credits: 6

Chemical Sciences

Rationale and Purpose of the Module: The purpose of this module is to introduce students to more advanced aspects of bioprocess engineering, building directly on the fundamentals covered in CG4003. The students will be informed on mass transfer, advanced biochemical kinetics, heat transfer specific to bioprocessing, mass balance, stoichiometric analysis relevant to bioprocessing, downstream processing unit operations, and emerging technologies in bioprocessing. In addition, the students will complete practical experiments relevant to course content, use Polymath to solve biological rate expressions and construct a process flow sheet for a biological process using SuperPro software.


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

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

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

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

CG5011 - PRINCIPLES OF CHEMICAL ENGINEERING
ECTS Credits: 6

Chemical Sciences

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

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

Review of Introductory Inorganic and Organic Chemistry
Review of Chemical or Engineering Thermodynamics
Review of Chemical Kinetics

CG5031 - CHEMICAL ENGINEERING DESIGN METHODS 1
ECTS Credits: 6

Chemical Sciences

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

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

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

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

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

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

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


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

Flowsheet synthesis, analysis and evaluation: modular- and unit equation-based modes for flowsheet synthesis; rigorous unit equation models for flash, distillation, and heat exchange operations. Recycle of process mass and energy streams; partitioning, precedence ordering and tearing; convergence criteria. Synthesis of separation systems: ideal distillation; azeotropic mixtures; distillation sequences.
Use of industry-standard computer package for modeling/simulation of steady state and non-steady state chemical processing operations.

Main design project selection. Preparation of preliminary mass and energy balances for main design project.

CH4001 - CHEMISTRY FOR ENGINEERS
ECTS Credits: 3

Chemical Sciences

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

Syllabus: Simple characterisation of atoms and molecules: basic atomic structure, ions and isotopes, atomic and molecular weights, the mole concept.
Early chemical concepts and their present day uses: e.g. Dalton Atomic Theory, Avogadro's Law, Oxidation and reduction.
Introduction to chemical bonding. Bond representation by Lewis dot, valence bond and molecular orbital structures. Hybridisation.
Periodic classification of the elements.
The Gas Laws, Stoichiometry.
Classification of chemical reactions. The Electrochemical Series.
Chemical equilibrium. Liquid solution chemistry. Acids and bases.
Selected applications of chemistry in domestic, medical and industrial environments.

CH4003 - PHYSICAL CHEMISTRY 2
ECTS Credits: 6

Chemical Sciences

Rationale and Purpose of the Module: i. To facilitate the student in understanding of the reaction thermodynamics and the role of thermodynamics in chemical reaction processes.
ii. To familiarise the student with the various reaction kinetics, including some complex kinetic schemes, their interpretation and applications in the appraisal of industrial problems.
iii. To develop the students ability to design basic kinetic experiments and to extract kinetic information from the measurements of concentration-time based data. iv. To provide the student with the basic knowledge of commonly used spectroscoope

Syllabus: - Reaction Process, role of thermodynamics
- Ficks law, diffusion
- Rate laws, integrated and differential forms
- Zero, first and second order rate laws
- Arrhenius equation, collision theory, activated complex theory
- Mechanism of reaction, steady state approximation
- Lindemann hypothesis, role of equilibria
- Photochemistry, fast reactions, polymerisation reactions
- Michaelis-Menten kinetics
- Catalysis
- Langmuir adsorption isotherm
- Applications to selected examples of industrially important reactions

Prerequisites: CH4002

CH4007 - ORGANIC PHARMACEUTICAL CHEMISTRY
ECTS Credits: 6

Chemical Sciences

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

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

CH4005 - PHYSICAL CHEMISTRY 4
ECTS Credits: 6

Chemical Sciences

Rationale and Purpose of the Module: To familiarise the student with the concepts of electrochemical systems under current flow situations.
To familiarise the student with electrochemical methods of chemical analysis.
To introduce applications of electrochemical methods in energy conversion and storage, sensors and production of chemicals

Electron transfer reactions. Overpotential/Polarization Effects.
Electrode reactions, oxidation/reduction.
Electrode kinetics, Butler-Volmer equation, limiting forms. I/E curves, interplay of mass transport and electron transport.
Electrical double layer.
Ideally polarizable electrode, capacitance, interfacial effects, models of the double layer.
Theoretical basis of electron transfer.
Polarography, steady-state, sweep, convective/diffusion techniques.
Electroanalytical techniques, cyclic voltammetry, chronocoulometry, potentiometric stripping analysis, differential pulse techniques.
Ion selective electrodes. Biosensors.
Electrodeposition: Electrocryallisation, bath design, additives (brighteners, throwing and levelling power).
Electrocatalysis, electrosynthesis.
Fuel cells, solar cells.
Surface analysis techniques, atomic force microscopy, scanning tunneling microscopy, scanning electrochemical microscopy.
Herbicides: 2,4,5-T and 2,4-D, synthesis, nucleophilic aromatic substitution reactions, dioxin formation; mode of action as auxin analogs.
Antibiotics: sulfonamides, synthesis, mode of action; penicillins: role of transpeptidase enzymes in bacterial cell wall synthesis, mode of action of penicillins as inhibitors of transpeptidase enzymes, synthesis of semi-synthetic penicillin structures.
Analgesic and antiarthritis compounds: aspirin, ibuprofen and naproxen, synthesis of naproxen, resolution and racemisation aspects.

Review of functional group chemistry.

Rationale and Purpose of the Module:

ECTS Credits: 6

CH4007 - ORGANIC CHEMISTRY

ECTS Credits: 6

Chemical Sciences

Rationale and Purpose of the Module: To introduce the student to fundamental aspects of organic chemistry eg the different families of compounds- their nomenclature, structure (2D and 3D) and isomerisation (if any).
To highlight the functional group of each family and relate structure to reactivity; to examine associated reactions/reaction mechanisms of the different functional groups; to introduce aromatic chemistry and study the chemical behaviour of aromatic compounds; to highlight current trends and applications in the areas of organic chemistry.
To carry out practical work to support and reinforce some of the theoretical aspects encountered; to encourage self-directed learning through the use of software and web sources.

Syllabus:

- Aliphatic Hydrocarbons:
  - Nomenclature; Structural formulae (2D&3D); Isomerisation; Reactions:
  - Combustion and Free Radical Rxns (Alkanes/Cycloalkanes):
  - Electrophilic Addition Rxns., Carbocarbons;
  - Polymerisation;(Alkenes/Cycloalkenes/Alkynes).
- Haloalkanes: Structural formulae; Nomenclature;
- Substitution/Elimination Reaction Mechanisms- SN1, SN2; E1, E2.
- Alcohols/Ethers: Structural formulae; Nomenclature; Classification; Physical properties; Occurrence and Uses.
- Aldehydes/Ketones: Structure & Basicity of the Carbonyl Group; Nomenclature; Properties; Preparation; Typical Carbonyl Group Reactions (Nucleophilic Addition Reactions);
  - Imine formation; Reaction with Grignard Reagents; Synthesis; Occurrence/Applications.
- Carboxylic Acids and Carboxylic Acid Derivatives:
  - Esters, Acyl Halides, Acid Anhydrides and Amides.
  - Functional Group; Nomenclature; Physical Properties; Acidity of the Carboxyl group; Preparation; Nucleophilic Acyl Substitution Reactions (Simple Carboxylic Acids and Esters only).
- Amines: Classification; Aliphatic and Aromatic Amines; Reactions; Occurrence.
- Aromatic Hydrocarbons: Benzene and Benzenoid Compounds.

CH4013 - ORGANIC CHEMISTRY 4

ECTS Credits: 6

Chemical Sciences

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


Chemical Sciences

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

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

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

Chemistry: Case studies where chemistry has solved major problems e.g developments in glass manufacture that makes phones possible, the advances in synthetic chemistry that allowed antibiotics to be produced at a global scale; the fundamentals of chemistry in polymers and polymeric processes; the chemistry of how aluminium is produced from bauxite and chemistry that makes lithium ion batteries possible. Analytical chemistry and biopharmaceuticals. Some fundamental concepts in bioprocess engineering. The role of an industrial chemist in a process work environment. Fundamentals of cellular respiration. The approach to research; case studies; identification of a problem, planning and pursuing a research strategy.

CH4012 - CHEMICAL REACTION MECHANISMS
ECTS Credits: 6
Chemical Sciences

Rationale and Purpose of the Module: To introduce students to chemical reaction mechanisms. To extend the students working knowledge of functional group chemistry; to expand the range of reagents, reactions and associated mechanisms.

Syllabus: Functional Group Chemistry Ctd; Aromaticity; Stereochemistry; Kinetics: Aldehydes and Ketones; Typical Carbonyl Group Reactions (Nucleophilic Addition Reactions); Imine formation; Reaction with Grignard Reagents; Reduction Rxns; Wittig Rxn; Synthesis; Occurrence and Applications.

CH4121 - AEROSOL SCIENCE
ECTS Credits: 6
Chemical Sciences

Rationale and Purpose of the Module: To develop a foundation in aerosol science and to develop the students understanding of its relevance to environmental problem, Catalyst structure and associated mechanisms of the various functional groups; to cover, in depth, aromatic chemistry and the chemical behaviour of aromatic compounds; to introduce the field of stereochemistry; to carry out practical work to support and reinforce some of the theoretical aspects encountered; to encourage self-directed learning through the use of software and web sources.

Syllabus: Introduction to catalysis, Defining the chemical reaction pathway. SN1 and SN2 reactions; applying use of stereochemistry projections; understanding the stereochemical course of enantiomers, diastereomers and meso forms; Fisher stereocchemistry: defining and naming chiral centres, reactions; Huckels rule; electrophilic aromatic substitution reactions; Stereochernistry: defining and naming chiral centres, enantiomers, diastereomers and meso forms; Fisher projections; understanding the stereochemical course of SN1 and SN2 reactions; applying use of stereochemistry and kinetic measurements to deduce the nature of a chemical reaction pathway.

CH4133 - ORGANIC CHEMISTRY 2B
ECTS Credits: 6
Chemical Sciences

Rationale and Purpose of the Module: To introduce to catalysis, Defining the chemical reaction pathway. SN1 and SN2 reactions; applying use of stereochemistry projections; understanding the stereochemical course of enantiomers, diastereomers and meso forms; Fisher stereocchemistry: defining and naming chiral centres, reactions; Huckels rule; electrophilic aromatic substitution reactions; Stereochernistry: defining and naming chiral centres, enantiomers, diastereomers and meso forms; Fisher projections; understanding the stereochemical course of SN1 and SN2 reactions; applying use of stereochemistry and kinetic measurements to deduce the nature of a chemical reaction pathway.

Syllabus: Introduction to catalysis, Defining the chemical reaction pathway. SN1 and SN2 reactions; applying use of stereochemistry projections; understanding the stereochemical course of enantiomers, diastereomers and meso forms; Fisher stereocchemistry: defining and naming chiral centres, reactions; Huckels rule; electrophilic aromatic substitution reactions; Stereochernistry: defining and naming chiral centres, enantiomers, diastereomers and meso forms; Fisher projections; understanding the stereochemical course of SN1 and SN2 reactions; applying use of stereochemistry and kinetic measurements to deduce the nature of a chemical reaction pathway.

CH4154 - BIOPHARMACEUTICALS
ECTS Credits: 6
Chemical Sciences

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

Syllabus: Notes on clinical (eg antibiotics, insulin and other proteins). "...as biopharmaceuticals, such as antibodies, insulin and other proteins. Chemistry: Case studies where chemistry has solved major problems e.g developments in glass manufacture that makes phones possible, the advances in synthetic chemistry that allowed antibiotics to be produced at a global scale; the fundamentals of chemistry in polymers and polymeric processes; the chemistry of how aluminium is produced from bauxite and chemistry that makes lithium ion batteries possible. Analytical chemistry and biochemistry underpinning consumer chemicals (such as detergents, shampoos, cosmetics etc), pharmaceuticals (eg aspirin, paracetamol, penicillin), oil industry (diesel, petrol, tars) and semiconductor industry (materials and processes involved in silicon processing and etching for microchip devices) as well as biopharmaceuticals, such as antibodies, insulin and other proteins.

CH4155 - ENVIRONMENTAL CATALYSIS
ECTS Credits: 6
Chemical Sciences

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

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

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

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


CH4155 - ENVIRONMENTAL CATALYSIS
ECTS Credits: 6
Chemical Sciences

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

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

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

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

Carboxylic Acids and Carboxylic Acid Derivatives: - Esters, Acyl Halides, Acid Anhydrides and Amides. Nomenclature; Physical Properties; Acidity of the Carboxyl group; Preparation; Nucleophilic Acyl Substitution Reactions; Interconversion of Carboxylic Acid Derivatives; Reduction Rxns; Pharmaceutical Applications. Fats, Oils, Soaps, Detergents; Current Trends.

Amines: Classification; Aliphatic and Aromatic Amines; Heterocyclic Amines; Basicity; Reactions; Occurrence. Racemates. and Fischer Projections; Enantiomers, Diasteromers and compounds (Cahn, Ingold & Prelog Rules); Perspective Activity; R/S Configuration of one chiral centre Stereochemistry: Chirality and Achirality; Optical Activity; R/S Configuration of one chiral centre compounds (Cahn, Ingold & Prelog Rules); Perspective and Fischer Projections; Enantiomers, Diasteromers and Racemates. SN1/SN2 and E1/E2 Reactions of Haloalkanes- Kinetics Orientation. Aromatic Heterocyclic Compounds; Interconversion; Activating/Deactivating effects and Aromatic Substitution Rxns of Benzene; Functional Group Aromatic Chemistry: Aromaticity Reviewed; Electrophilic Heterocyclic Amines; Basicity; Reactions; Occurrence. Fats, Oils, Soaps, Detergents; Current Trends.

Compounds of Carbon Only: Diamond, Graphite, Fullerenes and Carbon Nanotubes. Structure;Current trends;Uses. Stereochemistry: Chirality and Achirality; Optical Activity; R/S Configuration of one chiral centre compounds (Cahn, Ingold & Prelog Rules); Perspective and Fischer Projections; Enantiomers, Diasteromers and Racemates. SN1/SN2 and E1/E2 Reactions of Haloalkanes- Kinetics and Stereochemistry.

Prerequisites: CH4152

CH4203 - INORGANIC CHEMISTRY 2
ECTS Credits: 6

Chemical Sciences

Rationale and Purpose of the Module: - To introduce students to the chemistry of transition metal complexes


Organometallic compounds

Cluster compounds, multiple metal to metal bonds. Chemistry of metallic s and p block elements group by group.

Prerequisites: CH4122

CH4253 - INORGANIC CHEMISTRY 2B
ECTS Credits: 6

Chemical Sciences

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

-To introduce students to the chemistry of transition metal complexes


Prerequisites: CH4701, CH4252

CH4303 - ANALYTICAL CHEMISTRY 1A
ECTS Credits: 6

Chemical Sciences

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

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

Prerequisites: CH4303

CH4305 - ANALYTICAL CHEMISTRY 3
ECTS Credits: 6

Chemical Sciences

Rationale and Purpose of the Module: TO DEVELOP ANALYTICAL METHODS FOR THE QUALITATIVE AND QUANTITATIVE DETERMINATION OF SOLIDS AND SOLID SURFACES. TO INTRODUCE THE CLASSIFICATION AND CHEMISTRY OF SOLIDS

Syllabus: APPLICATION OF X-RAY METHODS INCLUDING DIFFRACTION, FLUORESCENCE AND ELECTRON MICROPROBE ANALYSIS. STRUCTURE DETERMINATION BY X-RAY METHODS. SOLID STATE REACTIONS INCLUDING CORROSION AND CEMENT CHEMISTRY; RELATIONSHIP BETWEEN CHEMICAL AND MECHANICAL PROPERTIES. APPLICATION OF GROUP THEORY, INCLUDING POINT AND SHAPE GROUPS.

REVIEW OF ALL MAJOR CLASSES OF SOLIDS * CRYSTALLIZATION-NUCLEATION AND GROWTH OF CRYSTALLINE SOLIDS * POLYMORPHISM IN PHARMACEUTICAL SOLIDS * ELUCIDATION OF THE STRUCTURE OF DNA
CH4407 - PROCESS TECHNOLOGY 4  
ECTS Credits: 6  

Chemical Sciences  

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

To give the student practical experience in the operation of separation processes.

**Syllabus:** Mass Transfer, diffusion in gases and liquids, laws of diffusive flux, mass transfer in solids, unsteady state mass transfer. Mass transfer across phase boundaries, mass transfer coefficients.

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

---

CH4415 - PROCESS TECHNOLOGY 3  
ECTS Credits: 6  

Chemical Sciences  

Rationale and Purpose of the Module: To provide the student with a comprehensive knowledge of chemical reaction engineering and reactor design.

**Syllabus:** Chemical reaction thermodynamics; review of chemical kinetics; ideal reactor types and design equations; design for single and multiple reactions; multiple reactor systems; temperature effects in reactor design and operation; assessment of and models for non-ideal reactor behaviour; reactor design for heterogeneous reactions.

---

CH4417 - PHARMACEUTICAL FORMULATION  
ECTS Credits: 6  

Chemical Sciences  

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

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

**Prerequisites:** CH4003, CH4004, CH4005, CH4405, CH4415

---

CH4701 - GENERAL CHEMISTRY 1  
ECTS Credits: 6  

Chemical Sciences  

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

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.

CS4001 - COMPUTER APPLICATIONS FOR SCIENTISTS 1
ECTS Credits: 6

Computer Science & Information Systems

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

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

CS4004 - SOFTWARE TESTING AND INSPECTION
ECTS Credits: 6

Computer Science & Information Systems

Rationale and Purpose of the Module: To introduce students to software testing and inspection such that when given a specification and an implementation of a program, the student would be able to write the tests, run them, and report on the errors found.

Syllabus: - Key Terminology: testing, debugging, error, bug, defect, quality, risk, mean-time between failures, regression testing, limitations of testing;
- Test types and their place in the software development process;
- Black-box and white-box testing;
- Program reading and comprehension;
- Refactoring code;
- Inspections, walkthroughs and desk-checking;
- Programming with assertions;
- Using a debugger for white-box testing;
- Reporting and analysing bugs: content of the problem report, analysis of a reproducible bug, making a bug reproducible;
- Test case design: characteristics of a good test, equivalence classes and boundary values;
- Expected outcomes, test case execution and regression testing;
- Requirements for white-box and black-box testing tools;

Prerequisites: CS4013

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.

CS4013 - OBJECT ORIENTED DEVELOPMENT
ECTS Credits: 6

Computer Science & Information Systems

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

Syllabus: Key terminology: objects, attributes, behaviours, states, classes, instances, associations; abstraction, inheritance, generalisation/specialisation, parent (base/superclass/ancestor) and child/children
CS4020 - INFORMATION SOCIETY
ECTS Credits: 6

Computer Science & Information Systems

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

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

Prerequisites: CS4222

CS4023 - OPERATING SYSTEMS
ECTS Credits: 6

Computer Science & Information Systems

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

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

Prerequisites: CS4211
CS4025 - DIGITAL AUDIO FUNDAMENTALS  
ECTS Credits: 6  

Computer Science & Information Systems  

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

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

CS4031 - INTRODUCTION TO DIGITAL MEDIA  
ECTS Credits: 6  

Computer Science & Information Systems  

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

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

CS4055 - DATA MINING AND DATA WAREHOUSING  
ECTS Credits: 6  

Computer Science & Information Systems  

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

Syllabus: What is data mining; why data mining; cross-industry standard process (CRISP-DM); CRISP-DM in action; data warehousing and enterprise intelligence; basic elements of data warehousing; what tasks can data mining approach; Data pre-processing: data cleaning, handling missing data, identifying misclassifications, graphical methods for identifying outliers, data transformation, numerical methods for identifying outliers; Hypothesis testing versus exploratory data analysis: dealing with correlated variables, categorical variables, using exploratory to uncover anomalous fields, numerical variables, multivariate relationships, selecting intersecting subsets of the data for further investigation; Data warehousing with intelligent agents: integration of database and knowledge-based systems, the role of artificial intelligence in warehousing; Data warehouse performance: measuring data warehouse performance, performance and warehousing activities; data warehousing and OLAP, relationship between data warehousing and OLAP; Aspects of building data warehouses: physical design, using functional independence, loading the warehouse, metadata management, operation phase, coherent management of warehouses for security; Data mining task in discovering knowledge in data: statistical approaches to estimation and prediction, univariate methods: measures of centre and spread, statistical inference, confidence interval estimation, bivariate methods: simple linear regression, confidence interval for the mean value of y given x, prediction intervals for a randomly chosen value of y given x, multiple regression, verifying model assumptions; Nearest neighbour algorithm, supervised versus unsupervised methods, classification task, k-nearest neighbour algorithm, distance function, combination function, quantifying attribute relevance, k-nearest neighbour algorithm for estimation and prediction; Classification and regression trees, C4.5 algorithm, decision rules, comparison of the C5.0 and CART algorithms applied to real data; Neural networks: neural networks for estimation and prediction, sigmoid activation function, back-propagation, gradient descent method, back-propagation rules, termination criteria, momentum term, sensitivity analysis; Clustering task: hierarchical clustering methods, k-means clustering; Self-organising maps, Kohonen networks, cluster validity, using cluster membership as input to downstream data mining models.

CS4057 - MACHINE LEARNING AND AI FOR GAMES  
ECTS Credits: 6  

Computer Science & Information Systems  

Rationale and Purpose of the Module: The purpose of the module is to provide the students with an overview of the applications of Artificial Intelligence and Machine Learning methods to Games and Game Development.  

Syllabus: A series of case studies on the application of
Artificial Intelligence and Machine Learning methods to all aspects of Games and Games Development will be presented. Example applications could include, Game Playing Programs, Path Finding, Control and Goal Oriented Action Planning, Multi-Agent Systems, Semi-automated Animation, and Sound Generation. The AI and Machine Learning methods discussed may include Symbolic AI, Expert Systems, Evolutionary Algorithms, Genetic Programming and Grammatical Evolution, Reinforcement Learning, Artificial Neural Networks, Swarm Intelligence, and Behaviour-Based Robotics and Control.

Prerequisites: CS4006

CS4067 - WRITING GAMES ANALYSIS
ECTS Credits: 6

Computer Science & Information Systems

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

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

CS4076 - EVENT DRIVEN PROGRAMMING
ECTS Credits: 6

Computer Science & Information Systems

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

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

CS4083 - SOUND SYNTHESIS
ECTS Credits: 6

Computer Science & Information Systems

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

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

CS4085 - COMPUTER GRAPHICS II - TOOLS AND TECHNIQUES
ECTS Credits: 6

Computer Science & Information Systems

Rationale and Purpose of the Module: Increase competence of student in the area of modern real-time computer graphics. This includes usage of Content Creation Suites, 3D Engines and combining available tools into a working tool chain. This is a follow on module to CS4815 which introduces more advanced graphics techniques and special effects.

Syllabus: - Basic Modelling Techniques
- Basic Animation Techniques
- Usage of Content Creation Suites
- Graphical File Formats (importing / exporting)
- Introduction to Real-Time 3D Engines
- Scene Management Techniques
- Special FX
- Particle Systems
- Pixel/Vertex Shaders

Prerequisites: CS4815

CS4107 - PERFORMANCE TECHNOLOGY 2
ECTS Credits: 6

Computer Science & Information Systems

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

Syllabus: This module will focus on the use of electronic sensors and actuators in combination with software and PC based approaches in the development of performance
The software and hardware development of a performance system. Implementing performance systems for multimedia (movement triggering, dance, installation, virtual spaces, enhanced environments). Implementing performance software for composition (composition with instruments and electronics, dynamic reactive audio and video playback).

---

**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 recursion algorithms;
- Linked Lists and Networks;
- Recursion, and the elimination of recursion from algorithms;
- Study of sorting algorithms: quicksort, heapsort, mergesort and bucket and radix sorting;
- Analysis of general divide-and-conquer algorithms;
- Searching: tree searching, AVL trees, splay trees;
- Graph algorithms: graph traversal and spanning forests, depth and breadth first search of graphs; connectivity; minimal spanning trees for weighted graphs; shortest path algorithms; networks.

---

**CS4125 - SYSTEMS ANALYSIS AND DESIGN**

**ECTS Credits:** 6

**Computer Science & Information Systems**

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

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

---

**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;
- 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

---

**CS4178 - SOFTWARE REQUIREMENTS AND MODELLING**

**ECTS Credits:** 6

**Computer Science & Information Systems**

**Rationale and Purpose of the Module:** Introduce students to the requirement and modelling phases of a system's (and software) development cycle. Requirements and models as knowledge capture and materialization in analyzable IT artefacts. Requirements and models that support the needs to change and evolution. Exposure to relevant methods, techniques and tools, exposure to case studies.

**Syllabus:**
- Requirements in the traditional and in the agile/evolutive system and software development process.
- Techniques for elicitation and discovery of requirements.
- Relation between requirements and knowledge capture: formal and informal materialisations.

---
4. Abstract models and constraints as co-design tools with diverse stakeholders.
5. Relation between requirements, models, and testing.
6. Functional and non-functional requirements.
7. Models for system behaviour: formal models, verifiable models, executable models.
8. Requirements and model validation
9. Requirement and model review, refinement and evolution
10. Negotiation and agreement: organisational and social issues; co-design.

CS4227 - SOFTWARE DESIGN AND ARCHITECTURE
ECTS Credits: 6

Computer Science & Information Systems

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

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

CS4416 - DATABASE SYSTEMS
ECTS Credits: 6

Computer Science & Information Systems

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

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

Prerequisites: CS4513

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

School of Modern Languages and Applied Linguistics

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

Syllabus: Principles of film history; Europe vs. America; the concept of National Cinema; aesthetics of silent vs. sound films; literature vs. moving images; visions of modernity; images of technology and science fiction. Aspects covered will include: Beginnings (Lumières brothers, Georges Méliès); Nordisk Film Company; Film and World War I; Soviet Cinema (Montage, Eisenstein, Dziga Vertov); Weimar Cinema (Expressionism, Fritz Lang, Murnau, mountain films, proletarian cinema, Marlene Dietrich); French cinema (Gance, Renoir); Nazi Cinema (cinema as propaganda; Riefenstahl); Italian Neo-Realism (Rossellini, de Sica), Spanish Cinema (Berlanga, Bunuel).
CU4121 - INTRODUCTION TO NEW MEDIA AND CULTURAL STUDIES
ECTS Credits: 6
School of Modern Languages and Applied Linguistics

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

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

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

Rationale and Purpose of the Module: The aim of this interdisciplinary module is to examine literatures from different linguistic and cultural contexts comparatively, both from the point of view of theory, and in practice. The students will be introduced to theoretical approaches to comparative literature and apply these to literary texts concerned with specific themes and genres in a variety of cultural contexts. In particular, the module will explore the ways in which such literary texts enable critical inquiry into common experiences past and present across cultures. The module will also provide the setting for further developing the students critical and analytical skills in the study of literature.

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

CU4128 - NEW MEDIA, LANGUAGE AND GLOBALISATION
ECTS Credits: 6
School of Modern Languages and Applied Linguistics

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 (in terms of power relationships, ownership, representation, cultural bias etc.); multilingualism and 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).

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

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

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

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

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

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

**DA5111 - DANCE PRACTICUM 1**
ECTS Credits: 12

**Humanities**

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

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

**DA5141 - PRACTICUM 1 - DANCE PERFORMANCE REPERTOIRE**
ECTS Credits: 12

**Humanities**

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

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

**DA6021 - DANCE ETHNOGRAPHY**
ECTS Credits: 6

**Humanities**

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

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

**DA6031 - CONTEMPORARY DANCE TECHNIQUES FOR PERFORMANCE 1**
ECTS Credits: 6

**Humanities**

**Rationale and Purpose of the Module:** This module introduces theoretical practices and principles current with contemporary and post-modern dance performance research. It provides students with the opportunity to experience and critically examine, through study and practice, a range of contemporary/post-modern dance techniques and theoretical principles towards their clear articulation through movement in choreography and performance. Current techniques informing the study and practice of dance will be contextualized with reference to historically key movements in contemporary and post-modern dance and choreography.

**Syllabus:** The knowledge is structured according to the theoretical frameworks, principles and practices underpinning the history of Western contemporary and post-modern dance, choreography and performance. Its transmission is primarily through live studio-based research into the aesthetic, historical, and ideological principles that have informed the development of the field of contemporary and post-modern dance performance. The knowledge is also stored and transmitted through literature and text-based dance research, video, DVD documentation of the canon of works which define the tradition.

**DA6041 - EMBODYING IRISH DANCE PRACTICES 1**
ECTS Credits: 6

**Humanities**

**Rationale and Purpose of the Module:** The objective of this module is to introduce students to the repertoires of diverse Irish traditional dance performance practices within a variety of theoretical, methodological and dance performance contexts. Students will learn to embody repertoires and their respective aesthetics from master tutors. This will hone the performance skills of students and will enhance their critical awareness of a range of diverse performance practices and their respective aesthetic systems within the Irish dance tradition and related dance traditions.

**Syllabus:** Students will develop their knowledge of and competence in traditional and contemporary Irish dance practice through practical studio-based dance workshops, performances and lectures; the history and development of different dance performance practices; aesthetic systems and related kinetic vocabularies; and dance notation skills, will inform their analytical perspectives of dance. Theory and practice are combined to deepen their engagement with Irish dance.
DM4003 - OPERATIONS MODELLING (ENG)
ECTS Credits: 6

School of Engineering

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

Syllabus: Lean Thinking and Operations
Introduce students to lean thinking and operations improvement tools used within DMAIC (Define-Measure-Analyze-Improve-Control) projects. Related lean thinking to operations modeling methods. Operations Modeling - Software: Introduce and provide students with base skills to use software to solve operations optimization models. The focus is primary on introducing the student to spreadsheet modeling, but brief introductions to other modeling and optimization software will be given. Students will apply software modeling skills obtained here to subsequent topics. Operations Modeling Under Constraints
Basic definition of Linear programming, demonstrate method via graphical method, model formulation applications in operations. Simplex method, Artificial starting solution method, interpretation of simplex tableau, sensitivity analysis. Transport model, Assignment model, Shortest Route model, Network Minimisation model, Maximum Flow Model, Transshipment model. Introduce binary and integer applications in operations analysis, integer solution methods such as branch-and-bound and meta heuristics solution methods. Decision Making Under Uncertainty
Introduce decision making under uncertainty. Introduce basics of simulation using spreadsheets.

DM4017 - SIMULATION MODELLING AND ANALYSIS
ECTS Credits: 6

School of Engineering

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

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

DM4027 - MEASUREMENT AND QUALITY SYSTEMS (ENG)
ECTS Credits: 6

School of Engineering

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


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 macro-economic theory and practice. The first half of the module is concerned with issues affecting the macroeconomy and Ireland's membership of the European Monetary Union. In the second six weeks of the module students will be exposed to current thinking in economics for business from a micro-economic perspective. In this section of the module students will not only engage with
The module is divided into two broad sections. The first section of the module deals with the theoretical underpinnings of environmental and natural resource economics. The second part of the module focuses on applying economic theory to the extraction of natural resources while also considers the connection between natural resources and economic growth in developed and developing countries.

**Section 1: Economic Theory and Public Policy Instruments**

- **Topic 1** Environment Issues and Concepts
- **Topic 2** Applying Techniques of Economics to Environmental Issues
- **Topic 3** Environmental Economics
- **Topic 4** Environment Policy in the EU
- **Topic 5** Environmental Economics
- **Topic 6** Environmental Policy in the EU
- **Topic 7** EU Competition Policy
- **Topic 8** The History of Monetary Integration

**Syllabus**

- **ECTS Credits**: 6
- **Rationale and Purpose of the Module**: The years since 1945 have been the longest period since 113 B.C. in which no army has crossed the Rhine with war-like intentions. The very idea of war between the European Union's member States seems as remote as to be nonsensical. The creation of the European Union (EU); a legal, political, economic, cultural, and soon to be military entity, is one of the greatest economic experiments in the history of Mankind. The shape and scope of the EU has the capacity to affect the lives of hundreds of millions of people in different ways, some positive, some negative. Thus a careful study of this experiment is in order.

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

**Syllabus**

- **ECTS Credits**: 6
- **Rationale and Purpose of the Module**: The nature, scope and key concepts of natural resource economics is followed by a discussion on the connection between markets, efficiency and sustainability including the concepts of willingness to pay and demand as well as cost and supply. The next topic examines the optimal level of pollution which is then followed by an analysis of public policy instruments in the face of market failure. A practical application here is that of EU carbon emissions trading as well as carbon taxes levies by some countries. This is followed by an investigation of the main theoretical and practical issues relating to exhaustible resources (e.g. energy). Issues relating to the extraction of coal, oil and gas are assessed. In addition, theories on the harvesting of renewable resources with specific application to forestry and fisheries are developed. The latter part of the module focuses on regional and global air pollutants. Finally, we discuss the connection between natural resources and economic growth with specific reference to both developing and developed countries.

**Syllabus**

- **ECTS Credits**: 6
- **Rationale and Purpose of the Module**: The years since 1945 have been the longest period since 113 B.C. in which no army has crossed the Rhine with war-like intentions. The very idea of war between the European Union's member States seems as remote as to be nonsensical. The creation of the European Union (EU); a legal, political, economic, cultural, and soon to be military entity, is one of the greatest economic experiments in the history of Mankind. The shape and scope of the EU has the capacity to affect the lives of hundreds of millions of people in different ways, some positive, some negative. Thus a careful study of this experiment is in order.

This module uses economics to understand the history of the EU, its significance in terms of the post 1945 World Economy, the EU's international interactions with the rest of the world, its development up to today, and the prospects for change most likely in the future. This module builds on introductory micro and macro economic principles and using economic theory as a lens we will use real world examples, data, and current topics to inform our discussions on the evolution of the European Union.
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 understand the cost of individual and firms choices and provide general frameworks to understand key microeconomic concepts and issues. This module aspires to develop the critical thinking abilities of students, not merely through the mastery of microeconomic concepts and techniques but also through a questioning approach to the body of knowledge which is facilitated primarily in the interactive smaller group weekly tutorial sessions and through the use of e-learning platforms.

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 quantities. Government intervention in the market and the allocation of resources in a market economy is also covered. 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. Different types of costs and how costs affect revenue and profits are examined. Perfectly competitive firms supply decision along with that of Monopoly (single priced vs price discrimination monopolists) are also studied.

EC4111 - MICROECONOMICS (NON BUSINESS)
ECTS Credits: 6

Economics

Rationale and Purpose of the Module: The subject content of this module develops some of the analysis presented in the introductory microeconomics and macroeconomics modules. The concept of market structures and producer and cost theory analysis is extended in the microeconomics section. Pricing of factor inputs is introduced. In terms of the supply-side of the firm, basic optimisation techniques are applied to production theory in dealing with the issue of input mix while cost theory is applied to problems like determining break-even output levels and make or break decisions. Other sections of the module provide the necessary microeconomic foundation for the analysis of labour markets, basic business problems and pricing of factor inputs. The macroeconomics section incorporates the labour market material into the general Keynesian, Classical model. As outlined below, a variety of topics and policy issues are then examined. The course also discusses issues in international monetary economics including the cost and

Syllabus: The syllabus is divided into a microeconomics and a macroeconomics element. The microeconomics section includes the following topics: 1) The theory of production and costs including isouquant and isocost analysis and traditional versus modern theories of costs 2) Models of imperfect competitive market structures and game theory and an analysis of Monopolistic Competition, Oligopoly and Duopolistic market structures 3) Labour demand and supply and 4) Pricing and allocating of the factors of production. The macroeconomics section includes the following topics: 5) Irish economics performance before and after 1987 including the reasons for the improvement in economic performance. 6) The labour market including a discussion on how price expectations are formulated and the impact of inflation and unemployment. 7) The Keynesian, Classical and Monetarist model. This includes a discussion on the Keynesian model, adaptive expectations and the concept of money illusion.
Monetarism. The neo-classical model and rational expectations. The effectiveness of macroeconomic policy under each of the models is addressed here. 8) The inflation-unemployment trade-off. Includes an analysis of the Phillips curve and the adjusted Phillips curve as well as deflation, expectations and credibility. 9) EMU and the European Central Bank including a discussion on the costs and benefits of EMU to Ireland. The design of the European Central Bank (ECB). Accountability and transparency. The ECBs monetary policy in EMU.

Prerequisites: EC4112, EC4111

ECTS Credits: 6

Rationale and Purpose of the Module:

This course provides an introduction to the theory and practice of econometrics, and presents a treatment of econometric principles for cross-sectional and time series data sets. The course concentrates on linear models and focuses on how the techniques can be applied in practice rather than on how their statistical properties can be rigorously derived. The essential purpose of the module is to meet the main empirical research needs of students who typically do not intend to specialise in econometric theory. However, the module also serves as a preparation for students who do wish to proceed to more advanced econometrics courses. Students are expected to have gained experience and show competence in the following transferable skills: data generation, IT (using statistical and econometric software), results interpretation and technical write-up, team-working, directed Web based searches, and use of library resources.

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

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

EC4333 - ECONOMICS OF EUROPEAN INTEGRATION
ECTS Credits: 6

Economics

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

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

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

Topic 1
Introduction to the Course
History of European Integration since the beginning of the 20th century.

Topic 2
Economic Growth in Europe
Growth in Europe: Facts and Figures
Growth effects and factor market integration
Solow's Medium Term Growth Model

Topic 3
Trade Theory and the EU
Absolute Advantage
Comparative Advantage
Production Possibility Frontier
Standard Trade Model
EU Trade Policy
Trade Effects
Tariffs

ECTS Credits: 6

Economics

Rationale and Purpose of the Module: This course deals with important macro and micro economic issues and problems facing the Irish economy in the context of its status as one of the most globally integrated economies. The course covers characteristics of the economy such as demographic and labour market characteristics and distributional aspects. It also examines the principal sectors of the economy including agriculture, services and manufacturing. It emphasises the challenges posed by increased integration in the international economy including questions of immigration and environmental sustainability.

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

Prerequisites: EC4101, EC4102, EC4004

EC4417 - INDUSTRIAL ECONOMICS
ECTS Credits: 6

Economics

Rationale and Purpose of the Module: To study the organisation of markets, firms and industries from both a theoretical and applied perspective. Pricing strategies, concentration, market performance, strategies of firms and of multinational enterprises (MNEs), and Public Policies will all be appraised at the level of the European Union evolving in a globalised context.

Syllabus:
1. Introduction (Scope and Method of Industrial Economics, S-C-P paradigm...)
2. Theories of the firm: Neoclassical and others
3. Market Structure
4. Structure and Strategy (Oligopoly Theory - Cournot and Bertrand duopoly models)
5. Non-price strategies
6. Technological Innovation
7. Barriers to entry in the case of the EU
9. A Case Study: the EU Banking Industry
10. Multinational enterprises, globalisation and regionalism
11. The emerging global ‘Asian’ firm (keiretsu, Chaebol and Chinese SOEs)
12. EU Policy with regard to industry

Prerequisites: EC4102, EC4101, EC4004

EC4427 - MANAGERIAL ECONOMICS
ECTS Credits: 6

Economics

Rationale and Purpose of the Module: This module aims to provide students with insights into how economics can aid managerial decision making within firms that operate in an increasingly global environment. Reflecting the highly globalized nature of tastes, production, labor markets, and financial markets in today’s world it provides tools for understanding managerial decision making under conditions of certainty and uncertainty (including risk analysis). It examines the nature of the firm in the global economy and different models of corporate governance. It covers economic approaches to decision making on production and cost. It also explores decision making on the demand side of the firm by covering demand estimation and different models of pricing.

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

Prerequisites: EC4101, EC4102, EC4004

EC4437 - INTERNATIONAL POLITICAL ECONOMY
ECTS Credits: 6

Economics

Rationale and Purpose of the Module: This is an exploration of the relationships between politics and economics in the global political economy (GPE). An understanding of the main issues confronting the global political economy is a pre-requisite to finding solutions to global problems. A fundamental assumption is that economic issues significantly influence political decisions and vice versa; it is no longer possible to separate arbitrarily one area of study from the other. The focus of the course falls upon the growth processes in world markets; patterns of global production, international money flows, global and financial investment practices and intensifying regionalism (as evident in the European Union, the North America Free Trade Association and the Asia Pacific Economic Community). 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.

Topic 1: Forces Shaping the World Economy
Topic 2: North South Issues: Trade Policy and Economic Development
Topic 4: International Trade and Growth
Topic 5: Globalisation and Foreign Direct Investment
Topic 6: Multinational Corporations and the Changing Nature of International Production
Topic 7: Environment, Sustainability and the Global Economy: Climate Change and effectiveness of global policy responses
Topic 8: Economic Development, Poverty and the Environment
Topic 9: The Global Financial and fiscal crises in the world economy and in Ireland.
Topic 10: Current and Future Economic Challenges for the World Economy

Prerequisites: EC4101, EC4111, EC4102, EC4112

ED5021 - C++ PROGRAMMING
ECTS Credits: 6

Electronic & Computer Engineering

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

Syllabus: Basic C++; syntax and semantics of the C++ procedural subset.

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

ED5031 - SOFTWARE ENGINEERING
ECTS Credits: 6
Electronic & Computer Engineering

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

Syllabus: Object Oriented Analysis/Design: Object Oriented Paradigms (one in detail e.g. OMT/UML) focusing on architecture and behavioural design and representation. Use Cases. Design Patterns. Software Reuse. Overview of Object Oriented Programming Languages (e.g. Java/Smalltalk). Individual Project/Case Study. Team Project in the area of Software Design for Advanced Communication Systems (e.g. Call Handling and Mobility Management Systems for the 3rd generation mobile system, UMTS).

ED5041 - COMPUTER NETWORKS 1
ECTS Credits: 6
Electronic & Computer Engineering

Rationale and Purpose of the Module: To provide students with a unified view of the field of multimedia communications and networking infrastructures and an understanding of how data is represented and reliably transmitted over different media. To provide students with an understanding of the structure of the Internet and world-wide web. To outline the major topics associated with multimedia communications (inter alia, applications, networks, protocols and standards). To equip students to quantify the communications requirements of various multimedia applications, and the computational overhead of their underlying network protocols.


EE4001 - ELECTRICAL ENGINEERING 1
ECTS Credits: 6
Electronic & Computer Engineering

Rationale and Purpose of the Module: To give students an understanding of the fundamental concepts of electricity and magnetism.


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

Rationale and Purpose of the Module: The engineering profession demands more than just technical know-how and an engineering education must reflect this. To have a successful and rewarding career to and to properly reflect the importance of the engineering professional in society it is necessary to have technical knowledge as well as the ability to express ideas, to assume leadership, to operate within teams (sometimes interdisciplinary) and organisations and to make ethically considered decisions.

3. The Engineer as a Professional. Professions & The Engineering Profession, Professional Bodies, Life Long Learning & Continuous Professional Development
4. Engineering Ethics, Engineers in Society, Responsibility in Engineering, Common Morality & Codes of Ethics, Analysing the Problem, Utilitarian & Respect for Persons Philosophies, Creative Middle Ways.
EE4005 - ELECTRICAL POWER SYSTEMS
ECTS Credits: 6
Electronic & Computer Engineering

Rationale and Purpose of the Module: The module aims to introduce students to a number of basic numerical methods commonly used in solving engineering problems and the concepts necessary to implement them in a relevant engineering software package. The second aim is to introduce students to high level object-oriented programming language and a software development environment.


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

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


EE4023 - DISTRIBUTED SYSTEMS
ECTS Credits: 6
Electronic & Computer Engineering

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

Syllabus: [Distributed System Fundamentals] Types of Distributed Systems, Distributed Systems Architectures, Location of Services, Data conversion and Marshalling of data, Replication, Clock synchronisation, Mutual Exclusion & Deadlock Detection, Distributed File System Case study. [Component based Software Architectures] Elements of Component based Software Architectures,

EE4115 - SYSTEMS ANALYSIS
ECTS Credits: 6

Electronic & Computer Engineering

Rationale and Purpose of the Module: To revise and develop student skills in the mathematical analysis of electronic problems.


LAPLACE TRANSFORM: Application of Laplace transform to circuit analysis, initial conditions, partial fraction decomposition, use of tables for inverse transformation, s and t shifting. Impulse and step response related to location of poles in s-plane, stability concept illustrated via feedback systems. Barkhausen criteria for oscillation. Geometric derivation of frequency domain response from pole-zero locations in s-plane.

COMPUTER SIMULATION: Use of appropriate package to model responses.


FOURIER SERIES: Development of Fourier series as a means for decomposing non-sinusoidal signals into sums of sinusoidal signals. Trigonometric and complex forms of series. Amplitude and phase spectra. Application to circuit responses. Spectrum of amplitude modulated signal. Distortion due to non-linear circuits exemplified by numerical calculation of distortion generated by

common emitter amplifier for finite amplitude input sinusoidal signals.


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

EE4313 - ACTIVE CIRCUIT DESIGN 1
ECTS Credits: 6

Electronic & Computer Engineering

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


Prerequisites: EE4102

EE4407 - ASICS 1
ECTS Credits: 6

Electronic & Computer Engineering

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


Description of combinational and sequential digital systems in the Verilog or VHDL Hardware description language (HDL):

Test benches and verification using HDLs. Synthesizeable HDL constructs and inference of common digital structures.

CMOS digital circuit design.

The MOS transistor and long channel model. Parasitic capacitances. Introduction to the short channel model. The static CMOS inverter and its static and dynamic performance.

Static CMOS logic gates, composite CMOS gates and switch based logic.

CMOS latches and flip-flops for ASIC design.

Example common ASIC blocks: adders and multipliers.


EE6011 - CRYPTOGRAPHY AND SECURITY FUNDAMENTALS
ECTS Credits: 6

Electronic & Computer Engineering

Rationale and Purpose of the Module: Introduce cryptography & security fundamentals, including security threats and vulnerabilities as well as security services for modern e-commerce and mobile applications.

Syllabus: [Introduction to information and network security] Why security is an important issue. [Threats and vulnerabilities] Threats from passive and
active attackers, such as: identity interception, masquerade, replay, data interception, manipulation, repudiation, denial-of-service, traffic-analysis, mis-routing and digital pests such as: trojan horse, virus, worms. [Security services, components and policies]. Security services such as: data confidentiality, data integrity and Email security. Security policies. Access control mechanisms.


EE6031 - MULTIMEDIA COMMUNICATIONS
ECTS Credits: 6
Electronic & Computer Engineering
Rationale and Purpose of the Module: Provides students with an understanding of applications and networking infrastructures used in communications for data in form of text, images, audio and video.


EE6411 - C++ PROGRAMMING
ECTS Credits: 6
Electronic & Computer Engineering
Rationale and Purpose of the Module: To introduce the C++ language and develop C++ programming skills.


EE6421 - SOFTWARE ENGINEERING
ECTS Credits: 6
Electronic & Computer Engineering
Rationale and Purpose of the Module: To understand and apply the object-oriented approach to software development. To emphasise Good Software Engineering Practices. To enhance individual and team working skills via individual investigative project and presentation, individual exercises and a team project.

Syllabus: Object Oriented Analysis/Design: Object Oriented Paradigms (one in detail e.g. OMT/UML) focusing on architecture and behavioural design and representation. Use Cases. Design Patterns. Software Reuse. Overview of Object Oriented Programming Languages (e.g. Java/Smalltalk). Individual Project/Case Study. Team Project in the area of Software Design for Advanced Communication Systems (e.g. Call Handling and Mobility Management Systems for the 3rd generation mobile system, UMTS).

EE6451 - DIGITAL SIGNAL PROCESSING
ECTS Credits: 6
Electronic & Computer Engineering
Rationale and Purpose of the Module: To introduce the theory of digital signal processing, including the following very important topics: the discrete Fourier Transform, the Z-transform and digital filter design.


EE6461 - INFORMATION THEORY AND CODING
ECTS Credits: 6
Electronic & Computer Engineering
Rationale and Purpose of the Module: This module aims to guide the student through the implications and consequences of fundamental theories and laws of information theory and to impart a comprehensive grounding in source coding, random and burst error protection coding theory with reference to their
increasingly wide application in present day digital communications and computer systems.


---

**EE6471 - ADVANCED DIGITAL SYSTEM DESIGN**  
**ECTS Credits: 6**

**Electronic & Computer Engineering**

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

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

---

**EE6621 - ASICS 1 (DIGITAL ASICS)**  
**ECTS Credits: 6**

**Electronic & Computer Engineering**

**Rationale and Purpose of the Module:** This module introduces issues relating to the design and implementation of application-specific integrated circuits (ASICs) for digital systems.


---

**EE6631 - TEST ENGINEERING 1 (PRODUCTION TEST SYSTEMS)**  
**ECTS Credits: 6**

**Electronic & Computer Engineering**

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

**Syllabus:** The increasing complexities and speed of operation of modern digital circuits and systems is increasing the demand on product testing. The module will concentrate on IC designs, with the following key areas covered:-

1. Semiconductor test overview:- test points for semiconductor devices from wafer to package.
2. Test Engineering requirements.
3. Digital logic test concepts:- sequential and combinational logic.
4. Memory test:- RAM and ROM.
5. Fault modelling and fault simulation.
6. Design for Testability (DFT).
7. Built-In Self-Test (BIST).
8. Problem with design complexity: System on a Chip (SoC) test problem.
9. ATE systems.
10. IEEE Standard 1149.1 (Boundary Scan).

---

**EH4001 - CRITICAL PRACTICE 1: ACADEMIC READING AND WRITING**  
**ECTS Credits: 6**

**School of Culture and Communication**

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

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

---

**EH4003 - INTRODUCTION TO LITERARY THEORY**  
**ECTS Credits: 6**

**School of Culture and Communication**

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

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

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

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

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

EH4017 - CONTEMPORARY AFRICAN LITERATURE IN ENGLISH
ECTS Credits: 6
School of Culture and Communication

Rationale and Purpose of the Module: On successful completion of this module, students will be able to apply a critical and cogent awareness of Contemporary literature from across the African continent
Multiple socio-political and cultural contexts associated with Anglophone African literatures
A sample of key theoretical debates in the field of African studies at large (connected to additional theoretical fields such as postcolonialism, human rights, feminism, ecocriticism, postmodernism, and so on)
A sample of key genres in African literature, include the memoir and autobiography, the novel, and drama
Ways to compare, contrast and combine different theoretical and methodological positions in the field of African Studies

Syllabus: This module will examine the literary representation of violence by authors writing across the African continent today. Specifically, our analyses of selected works and writers will explore the following themes: 1. how attempts toward the national catharsis of post-genocide Rwanda and post-apartheid South Africa have been unsuccessful in ridding the two countries of cruelty and bloodshed; 2. how child soldiers come to terms with their violent and violated childhood while struggling to reinvent themselves in the midst of ruined societies; 3. how anti-colonial liberation warfare is remembered and informs contemporary identity struggles; and 4. how the memory of slavery informs the desire for rootedness and home. We will read novels, autobiographies, and hybrid texts, alongside watching films and reviewing key essays in the field of African literature.

EH4026 - COLONIAL/POSTCOLONIAL LITERATURE IN ENGLISH
ECTS Credits: 6
School of Culture and Communication

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 literatures at large (connected to additional theoretical fields such as feminism, ecocriticism, postmodernism, and so on).

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/ hybridity, secular modernity/ religious conservatism, nation/nativism - and will proceed with 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.

EH4027 - CONTEMPORARY WOMEN'S WRITING
ECTS Credits: 6
School of Culture and Communication

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

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

School of Culture and Communication

Rationale and Purpose of the Module: This module offers students the opportunity to engage in intensive study of an author whose work has significantly affected the traditions of Irish literature written in English. Students will read an extensive selection of the author's works in order to understand fully his/her individual development and his/her important contributions to literary history. On successful completion of this module, students will have gained:
- An understanding of the author in his/her political, historical, and cultural contexts;
- Familiarity with a range of the authors works and with a range of his/her thematic, stylistic, aesthetic, and formal concerns;
- An understanding of the authors importance in the literary canon;
- An understanding of different theoretical and methodological ways of interpreting the major author.

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

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

EH4037 - INTRODUCTION TO CREATIVE WRITING
ECTS Credits: 6

School of Culture and Communication

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

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

EH4043 - IRISH LITERARY REVOLUTIONS 1880 - 1930
ECTS Credits: 6

School of Culture and Communication

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

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

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

---

**EN4053 - AUGUSTAN AND ROMANTIC LITERATURE**  
**ECTS Credits:** 6

**School of Culture and Communication**

**Rationale and Purpose of the Module:** This module is designed to draw together and combine the current first year Restoration and Augustan Literature module and the second year elective module Sensibility and Romanticism to offer a broader and more inclusive survey of British and Irish Literature between 1660 and 1830. This innovation is intended to offer students a more comprehensive 'long' eighteenth-century option in the second year in the proposed new BA.

**Syllabus:** The aim of this course is to provide students with a survey of literature in English between the Restoration of the British monarchy in 1660 through to the democratic reforms of 1830. This course aims to immerse students in the literary language of the time across several genres. We will first look at contexts for the emergence of modern genres such as the polemical pamphlet, the novel, and the journalistic essay. In this first part of the course is studied the prose and poetic writings of figures such as Aphra Behn, Jonathan Swift, Alexander Pope, Mary Wortley Montagu, and Oliver Goldsmith.

In its second half this module provides students with a survey of literature of the eighteenth and early nineteenth centuries, a period in which literature was involved with, and inspired by, revolutionary political activity. The writers of this period grappled with issues of race, slavery, gender, democracy, and republicanism. We will trace a shift from a negative and trivialising concept of 'the romantic' towards the more complex Romantic cults of Nature and Imagination, thought through in the context of intense friendships and collaboration between clusters of poets and critics. We will survey the writings Robert Burns, William Blake, William Wordsworth and Samuel Taylor Coleridge, Jane Austen, Percy Bysshe and Mary Shelley, among others.

**EN4015 - CURRICULUM AND POLICY STUDIES**  
**ECTS Credits:** 6

**School of Education**

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

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

**EN4041 - CONTEMPORARY UNDERSTANDINGS AND THINKING ON EDUCATION**  
**ECTS Credits:** 6

**School of Education**

**Rationale and Purpose of the Module:** During this module students will be exposed to some of the major contemporary thinkers in education. They will be encouraged to critically analyse these through the lens of deconstruction of their own very recent experiences of schooling. It is intended that the module will foster amongst students an appreciation of the interplay between educational theory and practice. Through induction into the scholarship of education, the module will aim to foster an understanding of teacher identity and from the perspective of teaching, learning and assessment (e.g. dominant teaching strategies and school structures; models of assessment; homework; technologies for teaching, learning and assessment including school design).

**EN4025 - INCLUSIVE EDUCATION 1: CONTEMPORARY PERSPECTIVES**  
**ECTS Credits:** 6

**School of Education**

**Rationale and Purpose of the Module:** Irish society has experienced unprecedented demographic change in recent times resulting in educators responding quickly to the changing nature of cultural diversity in the classroom and other learning communities. This module seeks to explore, recognise and appreciate new expressions of race and culture with the aim of developing students' awareness and understanding of diversity in society and its implications for their professional practice. Through these lenses students will consider schools as social settings (social class, gender, ethnicity, diversity, equality of treatment) and as sites of teaching, learning and assessment.

**Syllabus:** Recognising and understanding the origins of diversity within self and others; cultural diversity and the politics of difference; social inclusion and cultural diversity at local, national and international levels; policy and legal dimensions of diversity and implications for inclusive education from the perspective of race and ethnicity; implications for professional practice within the context of the classroom, school and wider community. Reflect critically on schools as institutions from a sociological perspective (gender, social class and equality of treatment) and from the perspective of teaching, learning and assessment (e.g. dominant teaching strategies and school structures; models of assessment; homework; technologies for teaching, learning and assessment including school design).
EN4043 - UNDERSTANDING CLASSROOM PRACTICES  
ECTS Credits: 6

School of Education

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

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

EN6151 - BECOMING A TEACHER: IDENTITY AND AGENCY  
ECTS Credits: 6

School of Education

Rationale and Purpose of the Module: This module aims to help student teachers to identify and critically analyse influences which shape the individual in becoming a teacher and to also focus on the key concepts of communication and reflection as significant processes in professional identity formation

Syllabus: This module will explore students' preconceived and lay theories of teaching and learning and will focus on how these theories are formed. Students will also explore the values which underpin their decisions to become a professional teacher. The module will introduce students to the concept of developing a professional identity and how they can be agents of their own learning. This identity and agency will be fostered through theoretical and practical work on communication and reflection. As part of the communication process, students will be encouraged to value the empowerment that literacy and numeracy bring to living and there will be a particular focus on school literacy and numeracy. They will also be supported to consider their role as agents of change in school and society, particularly in relation to issues of social and global justice. The concept and practice of reflection will be addressed in developing a professional identity.

EN6161 - UNDERSTANDING LEARNING  
ECTS Credits: 6

School of Education

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

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

EP4005 - NEW ENTERPRISE CREATION  
ECTS Credits: 6

Management and Marketing

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

Syllabus: The aim of this module is to provide students with an understanding of the stages involved in creating a new venture, including the development of skills in evaluating, preparing and presenting a business plan. It will provide an entrepreneurial mindset and a sense of entrepreneurial behaviour, which can be effectively used in a number of different work environments. The module will facilitate students in the development and application of the analytical and decision-making skills necessary in formulating, implementing and controlling a business plan. The module will also establish project credibility and improve students’ presentation and communication skills. The module will therefore address the following: • the importance of SMEs and business planning • developing and screening business ideas • feasibility analysis • components of the business plan • financing options for the business • presenting the business plan with confidence.
EP4007 - ENTERPRISE MANAGEMENT AND GROWTH
ECTS Credits: 6

Management and Marketing

Rationale and Purpose of the Module: How best to scale up and expand the small enterprise into international markets are key managerial challenges facing the owner-manager and if not accomplished effectively can lead to the demise of a potentially successful business. When managed successfully, it provides interesting, creative, and rewarding experiences for the owner-manager. In the small enterprise context there is a constant pressure to create and sustain a competitive advantage and to achieve this, the owner-manager needs to become sophisticated in their management practices and strategic thinking. This requires the owner-manager to move from the "entrepreneurial" to "professional" manager and leadership roles. This module will provide students with a strong theoretical knowledge of the challenges of managing a new and growing enterprise with an international perspective and will develop their skills and competencies to apply and integrate this knowledge to the realities of small enterprises.

Syllabus: The aim of the module is to provide students with an understanding of components of management and the process of strategy development to achieve firm growth and the creation of a competitive advantage in international markets. The module will develop a critical awareness and a detailed understanding of the challenges facing the entrepreneur/owner manager as they manage and grow their enterprise. The content will explore a range of classical and contemporary theories around enterprise management and the challenges and difficulties in implementing these in the growing enterprise. It will provide students with an understanding of the components of and the process of strategy development, implementation and evaluation by reviewing the various growth strategies available to the owner-manager to achieve international growth.

EP4407 - ENTERPRISE DEVELOPMENT
ECTS Credits: 6

Management and Marketing

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

Syllabus: The module will address the following topics:
- Understanding the role and importance of the small firm sector to the Irish economy.
- The entrepreneur/owner/manager characteristics and classifications; identification and evaluation of business opportunities; product/service development; market research; industry analysis; market/sales strategies; management structure; manufacturing/operations; sources of start-up finance/financing/requirements (projected cashflow, profit and loss and balance sheet);
- managing the new business (people and process management) and exit strategies for a new business in economic development. Students will also benefit from identifying the external and internal factors that impact on business start-up. Students are expected to prepare a feasibility analysis on a business idea to examine the viability of starting this business in a real-life situation.

EP4315 - ENTERPRISE FORMATION
ECTS Credits: 6

Management and Marketing

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

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

EQ4013 - FOUNDATIONS OF EQUINE LOCOMOTION
ECTS Credits: 6

Biological Sciences

Rationale and Purpose of the Module: The module provides students with the knowledge on the principles of athletic movement in the horse, which includes simple gait evaluation and consideration of various factors that impinge on efficient movement / locomotion. The module also develops a greater understanding of the physical preparations necessary for performance and the use of effective practices pre and post exercise. These are key skills in industry to prevent and recognise injury and maximise performance in race and sport horses.

Syllabus: Locomotion; the role of nervous, skeletal and muscular systems in locomotion, use of body segments - head and neck, back and ribs, hindquarters, ring of locomotion, limiting factors - joint range of movement, injury, willingness, opposing muscle groups, stance and flight phases of movement, simple gaits - walk, trot, canter, gallop. Common misconceptions in equine movement. Qualitative and quantitative analysis of equine movement, comparison with competition requirements, locomotion and soundness. Common simple gait abnormalities; lateral and medial deviation, skeletal foundations of gait abnormality, farriery and gait abnormality. Video analysis of simple gait abnormality. Developing equine movement; use of simple techniques on the flat over ground poles and jumping to promote efficiency, co-ordination and power in equine movement. Factors affecting equine locomotion; tack and equipment, the rider, ground surfaces. Lunging methods and equipment, loose schooling methods and safe practice in accordance to established guidelines.

EQ4025 - THE YOUNG HORSE
ECTS Credits: 6

Biological Sciences

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

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

**EQ4027 - EQUESTRIAN FACILITIES**

**ECTS Credits:** 6

**Biological Sciences**

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

**EQ4037 - PERFORMANCE RIDER DEVELOPMENT**

**ECTS Credits:** 6

**Biological Sciences**

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

**EQ4051 - INTRODUCTION TO HORSEMANSHIP**

**ECTS Credits:** 6

**Biological Sciences**

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

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

**ER4001 - ENERGY AND THE ENVIRONMENT**

**ECTS Credits:** 6

**Chemical Sciences**

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

**Syllabus:** Energy Resources & Supply Thermodynamics of energy conversion Electricity generation & storage Fossil fueled power generation Transportation Clean Technology for energy generation and transmission Nuclear power generation

**ER4011 - INTRODUCTION TO ENVIRONMENTAL & BIOSCIENCES**

**ECTS Credits:** 3

**Chemical Sciences**

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

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

**Prerequisites:** CH4701, CH4711, CH4721, BY4001
Rationale and Purpose of the Module: To understand the relationship between economic development and the environment: The evolution and contemporary application of the concept of environmental management. The interaction between nature, society and enterprise.

Syllabus: An understanding of the nature and significance of local, national and global environmental issues and challenges, and their historical background.

A grounding in the main elements of recognised environmental management systems (ISO 14001) and the issues involved.

An understanding of the concept of sustainable development and its importance.

---

Rationale and Purpose of the Module: To understand the role of EIA in planning; cases in EIA, strategic environmental assessment (SEA) Directive, purpose and stages.

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

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

Syllabus: [Introduction to transport and degradation of chemicals in the environment]
[Air] Sources - Source Parameters - Meteorology - Buoyancy - Topography - Gaussian - Mathematics - Deposition
[Surface Water] Source - Source Parameters - River Hydrometry - Dispersion - Mixing - Flow Depth & Velocity - Diffusion
[Groundwater] Hydraulic conductivity - Gradient - advection - diffusion
[Pollutant Degradation Pathways] Bioaccumulation - Biodegradation - Analysis of Rate Data - 0, 1st, 2nd Order - Integral method
[Environmental Fate Scenarios] - Screen3 model application - computer laboratory

---

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


Prerequisites: ER4507

---

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

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

**ER4707 - MONITORING AND RESEARCH METHODS**  
*ECTS Credits: 6*

**Chemical Sciences**

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

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

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

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

**Syllabus:** [Emissions & Impacts] industrial plant emissions & sources & emissions impact assessment methods & primary/secondary/tertiary/quaternary systems.  
[Groundwater Pollution] subsurface environment, groundwater movement, sources of pollution, point sources & diffuse sources & microbial activity.  
[Pollutant transport in groundwater], non-aqueous phase liquid pollution (NAPL) / (DNAPL).  
[Sampling Groundwater] well depth measuring & well evacuation & sampling.  
[Surface Water Pollution] emissions to water, water quality monitoring, water quality assessment.  
[Atmospheric Pollution] odour, SOx, NOx & Acids, organics, temperature pressure, humidity, molar volumes, converting ppmv to mg/m³, STP/NTP - time weighted averages, dust, USEPA methods, isokinetic sampling methods

**ER4708 - BIOMETRICS**  
*ECTS Credits: 6*

**Biological Sciences**

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

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

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

**School of Modern Languages and Applied Linguistics**

**Rationale and Purpose of the Module:** This module aims to provide an induction into third-level study for European Studies students and to mediate to new third-level learners the nature of European Studies as a combination of different academic disciplines and interdisciplinary possibilities. The module seeks to develop critical analytical skills, oral and written presentational skills and to provide new students with a critical overview of the contemporary state of their field of study. It will also have the goal of enhancing group experience and dynamic within the course with a view to maximising the educational benefit students derive from their disciplinary and linguistic studies. It will foster an awareness of the importance of autonomous learning and participatory research in the undergraduate educational experience. Finally, it will promote awareness among students of the fact that they will be working in an intercultural field and of the consequent importance of developing intercultural competences.

**Syllabus:** This introductory module is organised around selected set of themes in the interdisciplinary field of European Studies. Each theme set is formulated as a question put to participants, for unpacking, development, autonomous research, and intensive, teacher-facilitated discussion. The central focus of the module will be on fostering in new entrants the skills necessary for full engagement with the European Studies degree. Topics for study may include the following: Geographical and territorial definitions of Europe. Linguistic issues in Europe. Unity and diversity of European culture. The cultural industry in Europe. European values, democracy and diversity as case studies. The question of a European economic model. Citizenship in European and global contexts. The role(s) of Europe within globalisation and a wider `world system. Colonialism, its practices and its legacies. Ireland in a European and a global context.

**ET4003 - ELECTRO TECHNOLOGY (ED)**  
*ECTS Credits: 6*

**Electronic & Computer Engineering**

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

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

**Syllabus:** Electrical concepts: electric current, voltage, resistance, power. The relationship between them, units of current, voltage, resistance, power and frequency. The resistor colour code. Measurement of current, voltage, resistance, capacitance, frequency (V, A, W, F, Hz). Indirect measurement of power. The difference between AC and DC. Interpretation of circuit diagrams. Assembly of simple circuits using strip and breadboard. Passive components, resistors, capacitors, inductors, magnetic and electric field effects of charge and current. Diodes. The transistor switch. Voltage regulators, photoresistors, photodiodes, LEDs, phototransistors, variable resistors, potential dividers, potentiometers and relays. Sensors for sound, heat, light (photoreissitive and photovoltaic), movement. Electric motors, The mode of operation of the DC motor; back EMF; the variation of current requirement with the load, Reversing a DC motor. Strategies for teaching this subject area at second level. Designing, planning and managing appropriate teaching and learning activities for this subject area.
ET4008 - TEST ENGINEERING 2: DIGITAL CIRCUIT AND SYSTEM TEST  
ECTS Credits: 6  
Electronic & Computer Engineering

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

Syllabus: The increasing complexities and speed of operation of modern digital circuits and systems is increasing the demand on product testing. The module will concentrate on IC designs, with the following key areas covered:-

1. Semiconductor test overview:- test points for semiconductor devices from wafer to package.
2. Test Engineering requirements.
3. Digital logic test concepts:- sequential and combinational logic.
4. Memory test:- RAM and ROM.
5. Fault modelling and fault simulation
6. Design for Testability (DfT).
7. Built-In Self-Test (BIST).
8. Problem with design complexity: System on a Chip (SoC) test problem.
9. ATE systems.
10. IEEE Standard 1149.1 (Boundary Scan).

Prerequisites: ET4015

---

ET4013 - COMMUNICATIONS NETWORKING FUNDAMENTALS  
ECTS Credits: 6  
Electronic & Computer Engineering

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

Syllabus:

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

---

ET4015 - TEST ENGINEERING 1: PRODUCT DEVELOPMENT AND ATE SYSTEMS  
ECTS Credits: 6  
Electronic & Computer Engineering

Rationale and Purpose of the Module: To provide an insight into how commercial electronic systems are designed, manufactured and tested

Syllabus: Troubleshooting: How circuits, systems and components fail. How are they diagnosed and repaired

Reliability:

- Failure processes
- Reliability models
- Reliability analysis
- Life testing and acceleration
- Quality, warranty, maintenance, failure prediction and repair

Accelerated Life Testing. Impact on the Design and test processes

Electronic Production:

- PCB design and manufacture
- System testing and validation
- Production testing

Advanced Interconnection Systems for modern Electronic Production

---

ET4017 - COMMUNICATIONS NETWORKING STANDARDS  
ECTS Credits: 6  
Electronic & Computer Engineering

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

Syllabus:

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

---

ET4023 - INTRODUCTION TO SECURITY AND CRYPTOGRAPHY  
ECTS Credits: 6  
Electronic & Computer Engineering

Rationale and Purpose of the Module: To introduce fundamental concepts of information and network security. To introduce the ideas of threats and vulnerabilities such as viruses, worms, malware etc. To introduce fundamental ideas in cryptography. To place them in their historical perspective. To provide an appreciation of approaches to preventing such attacks.

Syllabus:

1. [Introduction to information and network security:] Why security is an important issue.
2. [Threats and vulnerabilities:] Threats from passive and active attacks.
active attackers and from digital pests such as virus, worms and malware.

[Historical development of codes and ciphers:] Classical ciphers (Caesar, Vigenere, one-time-pad etc.) Machine based codes: Enigma, Purple. Classical cryptanalysis (Beltchley Park, the Bombes etc.)

[Introduction to cryptography:] Basic approaches of symmetric key encryption. Block ciphers and stream ciphers. Basic approach of public key encryption. Introduction to key management. Application of ciphers. [Protection against attacks:] Introduction to security components such as firewalls and IDS, virus scanner, file integrity checker, OS update management. Role of passwords. Password cracking techniques.

ET4025 - NETWORK PROTOCOLS LABORATORY
ECTS Credits: 6

Electronic & Computer Engineering

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

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

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

Electronic & Computer Engineering


ET4047 - EMBEDDED SOFTWARE
ECTS Credits: 6

Electronic & Computer Engineering

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

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

ET4077 - CLOUD COMPUTING
ECTS Credits: 6

Electronic & Computer Engineering

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


ET4087 - ELECTRICAL AUTOMATION
ECTS Credits: 6

Electronic & Computer Engineering

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

This module replaces modules EE4207 - Industrial Automation, ET4315 Robotics 1: Industrial Automation and EE4057/EE4067 Electronics Systems for the Built Environment 1 on the BSc Electronics, and BSc Energy degrees. The modules have significant overlap and the change is to rationalise and update the modules. The purpose of this module is to equip students with the necessary skills to design, build and install automated systems in the built environment, in industry and
**Syllabus:** [Motion Control] Open Loop and servos/closed loop electric motors, drives and controllers. Steppers, DC servos, brushless motors, motion sensors / transducers for servo operation, tachometers, optical encoders, resolvers. [Pneumatics] Electro pneumatics, valves, pneumatic devices, pneumatic control systems. [Programmable Logic Controllers PLCs], PLC programming and installation. [Mechanical System Components] and considerations friction, low friction designs, inertia matching, gear boxes, screws, worms, toothed belts, harmonic drives. Choice of motor system to match speed, accuracy, stiffness, efficiency requirements etc. [Industrial Robots] Classification; robot programming. [Building Automation] Use of programmable logic devices for home/building automation and security applications in modern buildings. [Laboratory Work] Problem based laboratories will use a combination of Automation Rigs Labview and PLC exercises.

Prerequisites: ET4224

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

**Electronic & Computer Engineering**

Rationale and Purpose of the Module: *An introduction to the overall basics of electrotechnology and electrical machines.*

**Syllabus:** Electric charge, movement of charge as a current, conductors and insulators, what makes electrical current flow

potential difference, voltage, resistance to electric current, simple dc circuit analysis, series and parallel connection of components, capacitors and charge storage, charging capacitors

magnetic fields generated by electric current, electromagnetics.

alternating current (ac), simple ac circuits.

magnetism, magnetic flux, electro-magnetic induction.

electrical generators, transformers, rectification, direct current (dc) generators, dc motors, induction motors.

electronics, semi-conductor theory, diodes - rectification, transistors - switches/digital, amplifiers/analogue, IC’s.

**ET4121 - LABORATORY SKILLS 1**
ECTS Credits: 6

**Electronic & Computer Engineering**

Rationale and Purpose of the Module: *The aim of this module is to provide the students with the necessary basic laboratory skills in which to effectively undertake the necessary laboratory work within the course. The module will be based on an introduction to the electronic engineering laboratory and the development of laboratory skills required within the course. This will be introduced within the laboratory environment and the emphasis is on building practical electronic hardware skills.*

**Syllabus:** The module will consist of three main sections:-

1. Introduction to the electronic engineering laboratory:- codes of conduct, operation of test and laboratory test and measurement equipment: power supply, signal generator, oscilloscope, circuit prototyping boards. Taking measurements (voltage, current, resistance, inductance, capacitance, frequency) and measurement equipment limitations.

2. Electronic circuit prototyping, build and test:- soldering, wire-wrapping, board design and layout, component choice and correct handling. Determining component values from the package coding.

3. Printed Circuit Board (PCB) build and test, working in a project group environment.

---

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

**Electronic & Computer Engineering**

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

**Syllabus:** Overview of the Internet and World Wide Web; standards and specifications

Web browsers, Web servers and protocols

Designing & Creating Web Pages with HTML

Web programming: overview of XHTML, XML, CSS and ActiveX controls

Multimedia on the WWW including Audio, Video and graphics

Data & Information: characteristics, differences and structures

Data management: simple file storage & retrieval;

Introduction to data modelling

Introduction to the concept of Database Management System (DBMS)

Introduction to Structured Query Language (SQL)

---

**ET4203 - ANALOGUE ELECTRONICS 3**
ECTS Credits: 6

**Electronic & Computer Engineering**

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

**Syllabus:** Semiconductor materials: p-n junctions.

Basic semiconductor diode: structure and operation

Other forms of semiconductor diodes: zener diode, Light Emitting Diode, photodiode.

Use of the diode: voltage rectifiers in power supplies, LED displays.

Transistors: transistor operation.

Bipolar Junction Transistor (BJT): structure and operation of npn and pnp transistor.

Metal Oxide Semiconductor Field Effect Transistor (MOSFET): Structure and operation of nMOS and pMOS transistor.

Use of transistors in amplifiers: voltage amplifiers, amplifier class, analysis of amplifier operation.

Power semiconductor devices: thyristor and triac.

Data converters: ADC and DAC converters: architectures and operation.

Prerequisites: ET4141, ET4122
Electronic & Computer Engineering

Rationale and Purpose of the Module: In this module students will further develop skills to study, experiment and report on representative electronics based real world systems through interfacing via a PC or over communications networks. The students will apply theoretical and practical knowledge developed in preceding and concurrent modules in programming, databases and computer systems. Study will be through a problem-based approach that will integrate material from elsewhere in the programme of study and look forward to future modules.

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

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

**Prerequisites:** ET4112

---

**ET4244 - OUTCOME BASED LEARNING LABORATORY 2**
**ECTS Credits:** 6

Electronic & Computer Engineering

**Syllabus:** System dynamics: measurement of behaviour of system in the time domain. Benefits and costs of feedback. The student will be introduced to programming skills, data management skills and system dynamics and the use of a computer to instrument and control systems and processes.

**Prerequisites:** ET4224, ET4204

---

**ET4305 - INSTRUMENTATION AND CONTROL 1**
**ECTS Credits:** 6

Electronic & Computer Engineering

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

**Syllabus:**
- System dynamics: measurement of behaviour of system in the time domain. Benefits and costs of feedback.
- Stability and performance: time analysis of open and closed loop systems, Bode plots.
- Controller design: PID control.
- Sampled data processes, digital PID.
- Instrumentation buses and standards.

**Prerequisites:** ET4224, ET4204

---

**ET4407 - ELECTRONICS AND THE ENVIRONMENT**
**ECTS Credits:** 6

Electronic & Computer Engineering

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

**Syllabus:**
2. Design for Environment (ECO Design): Life cycle chain analysis, design for recycling, reverse manufacturing, reverse logistics, end of life solutions.
3. Green materials: lead free interconnects, halogen free materials, all other materials outlined in WEEE and ROHS, packaging.
4. Sustainability, energy efficiency, alternative power supply.
5. Case studies discussing such issues as environmental challenges in the semiconductor industry, producer responsibility in the electronics industry and sustainable trade in the electronics sector of emerging economies among other topics.
6. Invited talks: Seminars by the local electronics industry on environmental challenges in their company.
ET4437 - DISTRIBUTED COMPUTING AND JAVA  
ECTS Credits: 6  
Electronic & Computer Engineering  

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

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


Prerequisites: ET4253, ET4263

EV4005 - GRASSLAND AND GRAZING MANAGEMENT  
ECTS Credits: 6  
Biological Sciences  

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

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

EV4003 - EQUINE FEEDING AND BEHAVIOUR  
ECTS Credits: 6  
Biological Sciences  

Rationale and Purpose of the Module: To understand the basic principles of nutrition and the practical aspects of feeding. To understand normal patterns of equine behaviour and the identification of behavioural problems.

Syllabus: Digestive anatomy of the horse; Feedstuffs and forages in the horse’s diet; Diet formulation and nutrient requirements for horses; Feed composition; Feeding management; Bodyweight and Condition Scoring; Ethology and ethograms; Effects of domestication on behaviour; Learning Theory, Normal and abnormal equine behaviour; Environmental effects on behaviour; Causation, function, ontology of equine behaviours; Horses as herd animals; Behaviour in the wild; Normal and abnormal equine behaviour; Environmental effects on behaviour; how the horse learns; stereotypic behaviours; causes of abnormal and other undesirable behaviours; Behaviour as an indicator of welfare.

ET4725 - OPERATING SYSTEMS 1  
ECTS Credits: 6  
Electronic & 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.


Prerequisites: ET4253, ET4263

EV4012 - EQUINE ANATOMY AND PHYSIOLOGY  
ECTS Credits: 6  
Biological 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
The concept of 'dis-ease' as a departure from health and the module is to give students an understanding of the epistatic modifiers, tobiano, overo and spotting loci, loci including extension, agouti, colour diluting loci, and incomplete dominance; epistasis; Equine coat colour genetics including recessive, dominant, X linked genes; genotype frequencies; heritability; narrow and broad sense heritability; quantitative trait loci; genotype-environment interaction; estimated breeding values and selection; BLUP; Relationship; Inbreeding and linebreeding.

---

**FI4003 - FINANCE**  
ECTS Credits: 6

**Accounting & Finance**

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

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

---

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

**Accounting & Finance**

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

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

**Prerequisites:** FI4407

---

**FI4015 - CORPORATE FINANCE**  
ECTS Credits: 6

**Accounting & Finance**

**Rationale and Purpose of the Module:** This module provides students with a solid grounding in corporate finance, its application in share valuation within international capital markets and focuses on the decisions faced by corporate financial managers.

**Syllabus:** The course builds on students existing knowledge of discounted cash flow technique and covers more advanced capital budgeting, taking into account inflation, uncertainty and tax. Simulation and scenario analysis are covered and concept of a real option is introduced. The students are introduced to the international capital markets, and the main approaches...
to share valuation are discussed and contrasted. The importance of the assessment of risk and its impact on returns from financial assets are introduced, leading to an assessment of the cost of capital for a firm. The theory of the firm is explored in more detail, under the framework of agency theory. Dividend policy is studied, by reference to theory, taxation, the value of the firm and the wealth of shareholders. Capital structure is covered from a similar perspective. Mergers and acquisitions are evaluated. Ideas around the impact of corporate financial decisions on wider stakeholder groups and society more generally are discussed.

Prerequisites: FI4003

---

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

**Accounting & Finance**

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

Syllabus: The determinants of interest rates and how interest rates affect bond valuations; primary and secondary markets; money markets; bond markets; equity/stock markets; foreign exchange markets, derivative markets; the differences between investment banks and commercial banks; how companies and issuers interact with financial institutions; insurance companies; hedge funds; venture capital companies; risk exposures of financial institutions; regulation; contributors to the financial crisis.

Prerequisites: FI4003

---

**FR4141 - FRENCH LANGUAGE AND SOCIETY 1:**  
**INTRO FRENCH STUDIES**  
ECTS Credits: 6

**School of Modern Languages and Applied Linguistics**

Rationale and Purpose of the Module: (i) To present key issues in contemporary French society; (ii) to enable students to develop receptive and active language skills; (iii) to review French grammar; (iv) to examine developments in the French language; (v) to introduce students to the study of French literature.

Syllabus: Lectures introduce students to the study of social, historical, linguistic and literary aspects of French culture and society. Themes presented this semester are: (i) the Republican heritage; (ii) the modern short story and (iii) the history of the French language. Tutorials explore these subjects and students reading and writing skills are improved through regular exercises. Oral and aural skills in French are stressed and they are developed through the discussion of a broad selection of contemporary oral and written texts from diverse media. A review of French grammar is carried out.

Prerequisites: FR4142

---

**FR4147 - FRENCH LANGUAGE AND SOCIETY 5**  
**FRANCE, EUROPE AND B**  
ECTS Credits: 6

**School of Modern Languages and Applied Linguistics**

Rationale and Purpose of the Module: This module is an introduction to contemporary social, economic and political life in France in a European and global perspective. This is achieved: by developing students knowledge of French culture and society by focusing on the country’s cultural, social and political aspects by encouraging team-work and intercultural understanding. by focussing on key moments in the history of France in European affairs and that of France with the francophone communities, language varieties in France and the francophone countries.

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 centred on a series of lectures analysing the major issues with repect to France and wider world. 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
Rationale and Purpose of the Module:

ECTS Credits: 6

School of Modern Languages and Applied Linguistics

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

Syllabus: Students are introduced in lectures to the study of social, historical, linguistic and literary aspects of French society and culture. Themes explored this semester are:

(i) the contemporary French world of work and business
(ii) representations of French modernity in film and literature
(iii) French discourse genres. These topics are discussed in depth in the more active setting of weekly tutorials. Oral and aural skills in French are a particular focus, and they are developed through the discussion of a broad selection of oral and written material from diverse media. French grammar is studied at a more advanced level.

Prerequisites: FR4242

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

School of Modern Languages and Applied Linguistics

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

Syllabus: Students are introduced in lectures to the study of social, historical, linguistic and literary aspects of French society and culture. Themes explored this semester are:

(i) the contemporary French world of work and business
(ii) representations of French modernity in film and literature
(iii) French discourse genres. These topics are discussed in depth in the more active setting of weekly tutorials. Oral and aural skills in French are a particular focus, and they are developed through the discussion of a broad selection of oral and written material from diverse media. French grammar is studied at a more advanced level.

Prerequisites: FR4242

FR4243 - FRENCH LANGUAGE CULTURE AND SOCIETY 3
ECTS Credits: 6

School of Modern Languages and Applied Linguistics

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

Syllabus: Students are introduced in lectures to the study of social, historical, linguistic and literary aspects of French society and culture. Themes explored this semester are:

(i) the contemporary French world of work and business
(ii) representations of French modernity in film and literature
(iii) French discourse genres. These topics are discussed in depth in the more active setting of weekly tutorials. Oral and aural skills in French are a particular focus, and they are developed through the discussion of a broad selection of oral and written material from diverse media. French grammar is studied at a more advanced level.

Prerequisites: FR4242

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

School of Modern Languages and Applied Linguistics

Rationale and Purpose of the Module: This module aims:

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

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

Prerequisites: FR4246

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

School of Modern Languages and Applied Linguistics

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

To give students the opportunity to examine particular authors in greater detail.

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.

FR4623 - FRENCH LITERATURE AND CULTURE 3: THE ENLIGHTENMENT
ECTS Credits: 6

School of Modern Languages and Applied Linguistics

Rationale and Purpose of the Module: To examine the development of Enlightenment ideas in France in relation to the social, cultural and political climate of eighteenth-century Europe.

To enable students to apply critical skills to the study of eighteenth-century French texts.

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

Syllabus: Students are introduced to the Enlightenment in France through the study of a selection of cultural and literary texts. Texts are selected with a view to their linguistic accessibility and to their appropriateness on aesthetic, philosophical and historical levels.
FR4627 - FRENCH LITERATURE AND CULTURE 5: INTELLECTUAL MOVEMENTS
ECTS Credits: 6

School of Modern Languages and Applied Linguistics

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

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

FR4921 - FRENCH FOR BUSINESS 1A
ECTS Credits: 6

School of Modern Languages and Applied Linguistics

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

Syllabus: Students are introduced in lectures to the study of social, historical, linguistic and literary aspects of contemporary France. Themes presented this semester are (i) the French world of work and business, (ii) representations of French modernity in film and literature, and (iii) French discourse genres. Oral and aural skills in French are a particular focus, and they are developed through the discussion of a broad selection of contemporary oral and written texts from diverse media. With the use of authentic material (both written and oral) and with a variety of linguistic activities simulating a business environment students are asked to deal competently with tasks encountered in specific situations; the areas of focus include: applying for a job, job interview, working in a company. Students are also asked to do oral presentations on contemporary French society and culture. Students grammatical competence acquired in secondary school is further developed.

FR4923 - FRENCH FOR BUSINESS 3A
ECTS Credits: 6

School of Modern Languages and Applied Linguistics

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

Syllabus: Students are introduced in lectures to the study of social, historical, linguistic and literary aspects of contemporary France. Two/ three topics will be chosen each year, and a variety of theoretical and literary texts will be addressed in relation to each topic, for example existentialism; structuralism/semiology; post-modernism; feminist theory.

FR4925 - FRENCH FOR BUSINESS 5A
ECTS Credits: 6

School of Modern Languages and Applied Linguistics

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

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

Prerequisites: FR4924
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 (French). Students are introduced to the main policies and institutions governing the European Union and issues regarding its unity and diversity. In the lecture, students are introduced to the main policies of the EU and the place and role of France within Europe -by analysing primary sources relating to institutions and policies of the EU and the place and role of France within Europe -by giving students opportunities to practice their oral and written skills (e.g. video-viewing tasks) -by encouraging team-work and intercultural understanding via collaborative learning with Erasmus students.

Syllabus:
The French for Business 7 module provides students with a language rich environment to further their knowledge and increase their confidence. In the lecture, students are introduced to the main policies and institutions governing the European Union and issues relating to its unity and diversity. In the tutorials, students are taught the techniques necessary to make a detailed presentation on social or economic issues through the use of statistics, graphs and key phrases. In addition, through the study of TV documentaries and news bulletins students explore French and European society and culture from a linguistic and socio-economic point of view. Finally, students study a literary text related to the module title, currently, Voltaire's Candide.

Prerequisites: FR4925

FT4355 - ADVANCED NUTRIENT METABOLISM AND HEALTH
ECTS Credits: 6

 Biological Sciences

Rationale and Purpose of the Module: The purpose of this module is to give students a comprehensive understanding of energy metabolism and the metabolic processes involved in nutrient catabolism at a whole body level. This module will critically evaluate selected nutrients and bioactives with a focus on their potential health benefits. It will provide a comprehensive understanding of the aetiology and management of nutrition-related disorders in the clinical setting.

The purpose of this module is to:

- Provide advanced concepts in nutrient metabolism including an overview of the metabolic pathways involved in energy metabolism, catabolism and anabolism. The control of metabolic reactions.
- Outline the metabolism of selected nutrients. Critical evaluation of the evidence on selected nutrients and bioactives and their potential health benefits.
- Explore the use of nutrition for health in the clinical setting. Practical case studies will give students a practical understanding of the importance of nutritional management in a range of clinical conditions.
- As part of the overall assessment, and to further student ability to critique scientific research, a detailed literature review on a relevant research area will be conducted. Students will be expected to prepare a detailed report on their research work and to make a presentation on their findings to enhance communication skills.

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

Prerequisites: FR4925
FT4421 - INTRODUCTORY FOOD SCIENCE AND HEALTH
ECTS Credits: 6

Biological Sciences

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

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

FT4437 - MILK PROTEINS AS FOOD INGREDIENTS
ECTS Credits: 6

Biological Sciences

Rationale and Purpose of the Module: To provide students with an advanced understanding of the role of milk proteins as food ingredients.


FT4447 - FOOD QUALITY
ECTS Credits: 3

Biological Sciences

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


Prerequisites: FT4204, FT4325

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

Biological Sciences

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

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

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

Prerequisites: FT4335

FT6001 - FOOD SCIENCE AND FOOD SKILLS
ECTS Credits: 6

Biological Sciences

ACADEMIC CONTENT IS NOT CURRENTLY AVAILABLE FOR THIS MODULE - UPDATES ARE IN PROGRESS

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

School of Culture and Communication

Rationale and Purpose of the Module: To offer an introductory module in Celtic Civilisation for the Autumn Semester encompassing heroic Celtic literature, the history of the Celts and of the Celtic languages, as well as interpretation of the earliest accounts of the Celtic peoples and their customs and beliefs.

Syllabus: This module will give an overview of the history of Celtic languages, culture and literature, focusing on the following:
• an introduction to theoretical and scholarly debates on the origin of the Celtic speaking peoples
• Celtic prehistory and archaeology; customs and way of life
• critical interpretation of the earliest accounts of Celtic people
• the history and current position of the Celtic languages
• introduction to Early Irish Heroic Tales and representations of the heroic in Early Welsh Literature
GA4103 - INTRODUCTION TO IRISH FOLKLORE  
ECTS Credits: 6  

School of Culture and Communication  

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

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

Prerequisites: GA4105  

GA4105 - IRISH FOLKLORE 1  
ECTS Credits: 6  

School of Culture and Communication  

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

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

GA4115 - IRISH LANGUAGE 1  
ECTS Credits: 6  

School of Culture and Communication  

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

Enable the student to understand and use basic structures of Irish grammar.  

Expose the student to a range of vocabulary and expressions which will allow her/him to present her/himself to, and communicate with Irish speakers.  

To foster autonomous language learning skills.  

To develop listening and speaking skills in Irish.  

To equip the student with basic writing skills.  

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

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

Lectures / Léachtai: Lectures will cover the history of the Irish language and early Irish literature. Topics include the genetic relationship between Irish and other European languages, particularly other Celtic ones, and trace the development of the language from its primitive ancestor through to Old, Middle, and Early Modern Irish. A survey of early Irish literature will include selected stories from the Mythological, Ulster, and Fenian Cycles with analysis of predominant themes and symbolism.
reatha, spóirt agus araide; dúchas litríochta na Gaeilge sa látá atá inniu ann. Leabhair agus ailt roghnaithe de chuid móirscríbhneoirí na Gaeltachta; Máirtín Ó Cadhain, Seosamh Mac Grianna, Donncha Ó Ceilideachair san áireamh; iníchtechtadh ar théamhail agus ar stíl a gcuid saothar; buanna, laincaisí agus oidhreacht na n-údair Gaeltachta.

---

**GA4141 - TEANGA, SOCHAÍ AGUS SAÍOCHT 1**

**ECTS Credits: 6**

**School of Culture and Communication**

**Rationale and Purpose of the Module:** Go dtiocfadh na mic léinn ar thúsáinte ar ghnéithe de shaol comhairmeantha agus dothraíocht na Gaeilge, agus go mbeadh ar a gcumas an Ghaeilge a labhairt agus a scriobh go cruinn agus go nádúrtha ar ábhair, léiríonn lena ndaoine, lena n-áthair, lena n-aonair agus lena nádúrtha, le haghaidh an Ghaeilge a scríobh, agus le haghaidh an Ghaeilge a chur amach na Gaeilge, agus le gach thionchar de chuid na toscaíocht go dtagáilteach faoi Gaeilge. Léarchéad na Gaeilge i gcéim: saothar; buanna, laincaisí agus oidhreacht na n-údair agus saothar; buncair, agus oídheacht na n-údair. Léarchéad na Gaeilge i gcéim: leachtan foclóra agus nathanna cainte; cuntais agus éisteachta, foghraíochta agus léitheoireachta san léamh, i scríobh agus i labhairt na Gaeilge le cleachtála. Léarchéad na Gaeilge i gcéim: cuntas agus éisteachta, foghraíochta agus léitheoireachta san léamh, i scríobh agus i labhairt na Gaeilge le cleachtála.

---

**GA4143 - TEANGA, SOCHAÍ AGUS SAÍOCHT 3**

**ECTS Credits: 6**

**School of Culture and Communication**

**Rationale and Purpose of the Module:** Go dtiocfadh na mic léinn an teagmháil daingean idir na Gaeil agus an Mhór-Roinn agus Meiriceá Thuaidh agus Theas; oídhcheacht Ghaelach na hEorpa agus Meiriceá; go mbeadh cur amach leathan ag an mic léinn ar shaoil na Gaeilge agus ar shaol na nGaeil ar 16ú go dtí an 17ú haois, agus ar a shaoiltheas, thráthaidh an n-amhráin; forbairt, leathna, saithriú na bháirte, an mhadhráin agus an mheadhráin; go mbeadh ar a gcumas an Ghaeilge a scrioibh, agus ar shaol na Gaeilge. Léarchéad na Gaeilge i gcéim: leachtan foclóra agus nathanna cainte; cuntais agus éisteachta, foghraíochta agus léitheoireachta san léamh, i scríobh agus i labhairt na Gaeilge le cleachtála. Léarchéad na Gaeilge i gcéim: cuntas agus éisteachta, foghraíochta agus léitheoireachta san léamh, i scríobh agus i labhairt na Gaeilge le cleachtála.

---

**GA4145 - LITRÍOCHT AGUS SAÍOCHT 1250-1690**

**ECTS Credits: 6**

**School of 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.

---

**GE4141 - GERMAN LANGUAGE AND SOCIETY 1: INTRO GERMAN STUD 1**

**ECTS Credits: 6**

**School of Modern Languages and Applied Linguistics**

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

---

**Syllabus:** Lorg na luath-Ghaeilge ar an teanga chomhaimseartha; comhthéacs staithí agus sósailte na litríochta Gaeilge a scriobhadh idir 1250 agus 1700. An amour courtois i litríocht na Gaeilge; na dánta agus na hAmhráin in Éirinn. Róimheas litríochta na nGaeilge; a thionchar traidisiúnta, an dhuine ceithre mhor-thin agus an dTuath Dé Laoghaire; litríocht na mban agus an mheadhráin na mna. Róimheas litríochta na nGaeilge; a thionchar traidisiúnta, an dhuine ceithre mhor-thin agus an dTuath Dé Laoghaire; litríocht na mban agus an mheadhráin na mna.
**GE4143 - GERMAN LANGUAGE AND SOCIETY 3: LIVING AND WORKING GER**
ECTS Credits: 6

**School of Modern Languages and Applied Linguistics**

**Rationale and Purpose of the Module:** Linguistic and cultural preparation for Co-op or SOCRATES placements in a German-speaking environment.

To explain the German educational system, structures in a German company and in the world of trade and business in general patterns of everyday life.

To develop students' skills in the analysis of more complex literary texts in German.

To provide students with the skills to do a presentation in the foreign language.

To further consolidate grammatical structures, extend vocabulary and increase accuracy in oral and written German.

**Syllabus:**
- Lecture: education environment: the educational system, universities and university life, work environment: vocational education, industrial relations, company structures, trade unions; Germany as a multicultural country; intercultural communication theory; the media landscape in Germany.
- Tutorials: a) discussion of authentic text material and a literary text to support the lecture; focus on the development of written skills and cultural awareness; b) grammar in context.
- Language laboratory: CALL exercises; language-related exercises based on German TV programmes dealing with the issues covered in the lecture.

**Prerequisites:** GE4146

---

**GE4211 - GERMAN FOR BEGINNERS 1**
ECTS Credits: 6

**School of Modern Languages and Applied Linguistics**

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

To introduce students to the academic study of the German language, its historical, social and structural dimensions.

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

To introduce students to autonomous language-learning methods.

**Prerequisites:** GE4142

---

**GE4147 - GERMAN LANGUAGE AND SOCIETY 5: GERMANY, EUROPE AND BEYOND**
ECTS Credits: 6

**School of Modern Languages and Applied Linguistics**

**Rationale and Purpose of the Module:** To examine Germany's role in present day Europe and explore the interrelatedness of German social and cultural developments with those of its neighbours.

To develop inter-cultural awareness and communication skills.

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

To develop translation skills and enhance students' presentation skills in the foreign language.

**Syllabus:**
- Lecture: Germany and its neighbours; Germany and the Third World; German economic and cultural activities abroad; national images and their origins; the image of Germany abroad and the German self-image; German/Italian relations.
- Tutorials: a) discussion of texts connected with the lecture; contrastive cultural studies including students' presentations in the foreign language; b) grammatical exercises c) graded translation exercises focussing on German/English translations.

---

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

**School of Modern Languages and Applied Linguistics**

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

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

Tutorials: Students complete their grounding in the basic structures and vocabulary of the German language, focusing particularly on grammar and lexis in context.

Students are encouraged to consolidate the skills they have acquired in earlier modules, focusing particularly on the development of speaking and writing skills and cultural awareness.

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

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

**Prerequisites:** GE4212
Rationale and Purpose of the Module: To provide students with an introduction to German-speaking countries as physical, cultural and political entities; to develop communicative skills by revising and consolidating basic structures and vocabulary; to introduce autonomous language learning methods. Emphasis in modules GE4241 and GE4242 is placed on establishing a solid foundation in the language; by the end of Year 1, students are expected to use all basic grammatical structures with a high degree of fluency and correctness.

Syllabus: Lecture: The German language, its history and relationship with other languages; political geography of the German-speaking countries; sociocultural and historical background to the German-speaking countries of Europe in the 19th and early 20th century. Tutorial work: Grammar/translation: introduction to basic grammatical categories and terminology; consolidation of existing grammatical knowledge and expansion into more complex structures; contrastive work by means of English/German translation exercises; Text analysis & production: principles of textual analysis and text discussion (literary and non-literary); grammar in use/communicative grammar. Laboratory: 1 hour per week in the CALL/language laboratory will support grammar and oral work.

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

Syllabus: Lecture: education environment: the educational system, universities and university life, work environment: vocational education, industrial relations, company structures, trade unions; Germany as a multicultural country; intercultural communication theory; the media landscape in Germany. Tutorial work: one hour textwork consolidates skills relating to textual analysis/production, grammar in use and German-English translation; one hour oral discussion/presentation will also focus on authentic text material (written, video, etc) relating to the lecture series. Literary texts relating to lectures will also be discussed and examined in the oral and written exams; one hour German linguistics continues with past and current developments in the German language.

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

Syllabus: Lecture: What is literature? How do we interpret a literary text? A brief history of German literature. Tutorials: a) analysing literary examples from different periods; b) detailed analysis of a longer text in the German language; introduction to the interpretation of literary texts in a foreign language.

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

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

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

School of Modern Languages and Applied Linguistics

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

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

GE4921 - GERMAN FOR BUSINESS 1A
ECTS Credits: 6

School of Modern Languages and Applied Linguistics

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

Syllabus: Lecture: The German language, its history and relationship with other languages; political geography of the German-speaking countries; sociocultural and historical background to the German-speaking countries of Europe in the 19th and early 20th century. Tutorials: a) reading of literary texts to provide further access to the period while at the same time introducing reading techniques, principles of textual analysis and text discussion in oral and written form; b) introduction to business in German and project work in Business German Language laboratory: exercises in pronunciation, listening comprehension and grammar utilizing CALL facilities.

GE4923 - GERMAN FOR BUSINESS 3A
ECTS Credits: 6

School of Modern Languages and Applied Linguistics

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

Syllabus: Lecture: education environment: the educational system, universities and university life, work environment: vocational education, industrial relations, company structures, trade unions; Germany as a multicultural country; intercultural communication theory; the media landscape in Germany. Tutorial: a) discussion of authentic text material and a literary text to support the lecture; focus on the development of writing skills and cultural awareness; b) discussion of authentic text material and a literary text to support the lecture; focus on the development of writing skills and cultural awareness; b) discussion of authentic text material and a literary text to support the lecture; focus on the development of writing skills and cultural awareness.

Prerequisites: GE4922

GE4927 - GERMAN FOR BUSINESS 7A
ECTS Credits: 6

School of Modern Languages and Applied Linguistics

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

Syllabus: Lecture: Germany and its neighbours; Germany and the Third World; German economic and cultural activities abroad; national images and their origins; the image of Germany abroad and the German self-image; German/Irish relations. Tutorials: a) discussion of texts connected with the lecture; contrastive cultural studies including students' presentations in the foreign language; b) business text analysis and production, consolidation of language skills in a range of registers c) translation theory and practice, focusing on German/English scientific, economic and journalistic texts.

Prerequisites: GE4924

GE4925 - GERMAN FOR BUSINESS 5A
ECTS Credits: 6

School of Modern Languages and Applied Linguistics

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

Syllabus: Lecture: Focus on the different specialisations within business studies chosen by the students; introduction to key principles of marketing, economics, human resources, insurance and accounting in German with presentations on the educational system and employment sector. To develop awareness of German companies in Ireland / Irish companies in Germany. To introduce issues in intercultural communication (German/Irish).

Prerequisites: GE4923

HI4007 - HISTORIOGRAPHY
ECTS Credits: 6

History

Rationale and Purpose of the Module: This module will aim to provoke students into thinking about history in analytically new and creative ways, through introducing them to alternative historiographical approaches for understanding the past. Issues of
objectivity sources and the archive will be scrutinised from a variety of perspectives, including postmodern and postcolonial interdisciplinarities. By the end of the module students should have built on their use of a broad range of historical source materials and enhanced the necessary skills to make critical use of them. They will be able to demonstrate detailed knowledge of the most significant historiographical debates and comprehend the reasons why historical interpretations change and are revised. Furthermore, they will have been introduced to the work of important past and contemporary thinkers and philosophers of history such as Leopold Von Ranke, Karl Marx, Herbert Butterfield, Walter Benjamin, Michel Foucault and Hayden White.

**Syllabus:** The syllabus will be principally designed around discussions on questions of historiography and how past and recent controversies provide insights into interpretative differences for understanding both history and myth; enlightenment and romanticism; thinkers, philosophers and philosophies of history/historicism; empiricism and scientific history; the influence of propaganda and secrecy; Marxism; the Annales school; revisionism; postcolonialism; gender and ethnicity; the peripheries of historical knowledge; the archive; subaltern studies; memory (remembering to forget); public history and commemoration; the end of history?

---

**HI4063 - NASTY, BRUTISH AND SHORT? EARLY MODERN EUROPE, C. 1450-1700**  
ECTS Credits: 6

**History**

**Rationale and Purpose of the Module:** This module aims to give students a thematic and chronological overview of the history of the Middle East and Europe during the sixteenth and seventeenth centuries. It is intended as an introduction into the early modern period, combining various aspects of the discipline expected to appeal to second-year students.

**Syllabus:** The waning of the middle ages and the culture of the renaissance; the political geography of early modern Europe - republics, new monarchies and composite polities; Europe in the broader context of the discovery of America and the rise of the Ottoman Empire; society: hierarchy; minorities and outsiders; family life - birth, marriage and death; humanism and education; confessionalization in the Holy Roman Empire; Wars of Religion in France and the Netherlands; Philip II and Spanish world hegemony; the Thirty Years' War and the military revolution; congress diplomacy at Westphalia, the Pyrenees, Nijmegen and Utrecht-Rastatt; the witch craze and its critique; the scientific revolution; Dutch economic primacy; gender and women; court society and the world of the minister-favourite; France and Spain in the age of Louis XIV and Carlos II; Austrian expansion into the Hungarian plain; the partition of the Spanish Monarchy in 1713-14.

---

**HI4071 - DOING HISTORY: PAST, PRESENT AND PRACTICE**  
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:** Historians and their sources; primary and secondary sources; identification, location, accession, critical evaluation and use of sources; public and private archives; origins, ideologies and holdings; using archives: access, availability, procedure and professional practice; the range and scope of electronically available source materials; audio and visual sources; old histories and new histories; forgery, fabrication and the historian; the withdrawal, suppression and destruction of sources; professional practice and political necessity; appropriate citations of primary and secondary sources; presenting a small research project.

---

**HI4073 - FROM THE PROPHET TO ISIS: THE MIDDLE EAST AND EUROPE, ANCIENT TO MODERN**  
ECTS Credits: 6

**History**

**Rationale and Purpose of the Module:** The rationale for introducing a new module is to offer students the possibility to choose a new subject not previously taught at UL. The purpose of the module is to provide students with a general overview of the History of the Middle East from the age of the Prophet in the 7th century to the 21st century highlighting historical events and trends that may help them to better understand current socio-political events in the region that impact the wider world.

**Syllabus:** Course Content: This module provides a foundational overview of the history of the Middle East and its relationship with Europe from the emergence of Islam in the 7th century to the contemporary era including the recent struggle against ISIS and the self-proclaimed Caliphate. During the twelve weeks we will explore the emergence of Islam as a religion and the political institutions that were created with its expansion throughout the region and beyond. We will focus on chronology but also on themes, such as the development of science, technology, social life, religion and politics. Moving forward in time, we will discuss the transitional period towards modernity and its meaning, the increasing foreign presence and what this meant for the region and the creation of the modern Middle East following the end of the First World War. The last few classes will explore some of the contemporary events with the purpose to use previous history in order to shed light on current matters. The topics discussed will include: definition of the Middle East; Muhammad and the Rise of Islam; Institutions of Government and Religion; Culture and Society; Regionalisation vs. Centralisation of political authority; Islam in Europe; The rise of the Gunpowder Empires 1500-2000; The age of Reforms; The First World War in the Middle East and Colonialism; Nationalism and its 'Others'; Independence and Revolution; The Middle East and Europe in the contemporary World.

---

**HI4083 - MAKING IRELAND BRITISH?: EARLY MODERN IRELAND, 1536-1750**  
ECTS Credits: 6

**History**

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

**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.
HI4103 - IMAGINING IRELAND: FROM EARLY MODERN TO MODERN
ECTS Credits: 6

History

Rationale and Purpose of the Module: This module centres on how Ireland and Irishness was imagined by people from the early modern to modern periods. The imagining of history is a key trend in popular culture and therefore, students need to be provided with the skills to deconstruct representations of the past and to interrogate their own working assumptions about history. Using a chronological approach examining key events, themes and milestones from the Battle of Kinsale in 1601, to the collapse of the Irish economy in the early twenty-first century, it covers political, social, economic and cultural dimensions of Irish history during tumultuous times. However, three large themes will be examined throughout the module - nation and state building; identity formation and the experience of life. Issues to be addressed will include Ireland’s transition from a traditional to a modern society, economy and polity, language, gender, religion and how the broader European, Atlantic and global framework influenced the imagined ‘nation’. The modules enables students to examine the ways in which the past has been presented, interpreted and re-interpreted in various genres; to uncover the assumptions or agendas behind representations and to reflect critically upon how Ireland has been and is imagined using the critical methods of historical enquiry.

Syllabus: land of saints and scholars?: origins of Ireland’s various identities; imagining ascendancy Ireland; Irish culture, religion, and language; the nation depicted by competing interests: political factions, religious groups and commercial organisations; nationalisms and unionism; Images and Irish identity; symbolism and ritual; myths and realities; the state and its motives; religion, gender and identity creation in modern Ireland

HI4117 - THE IRISH CONFLICT, 1948 - 98
ECTS Credits: 6

History

Rationale and Purpose of the Module: To provide students with a comprehensive grasp of the origins and nature of the 'Irish Troubles' from the birth of the Irish Republic to the 'Good Friday Agreement'. The course traces the evolution of the political crisis in both Irish jurisdictions, with reference to the British perspective. Themes will include the Anti-Partition League, Clann Na Poblachta and the United Nations; Saor Uladh, Sinn Fein and the IRA during the 'Border Campaign'; Unionism and Loyalism, Cathal Goulding and the move to the Left; special powers and civil rights; Official and Provisional IRA; 'Bloody Sunday' at home and abroad; counter-insurgency in the two jurisdictions; Long Kesh, Portlaoise and Wakefield; Ulster Defence Association, Ulster Volunteer Force, Red Hand Commando and Ulster Resistance; Saor Eire, Irish National Liberation Army, Irish Republican Socialist Party and Irish People’s Liberation Organization; The Hunger Strikes, 'Ulsterization' and the 'Long War', Section 31, propaganda and 'D notices'; Foreign Affairs, the White House and United Nations; Abstentionism, rise of Sinn Féin and the origins of the Peace Process

Syllabus: The course is divided into seminars which address key concepts, events and dynamics of the period. The student will learn to assess the role of such organizations as the Anti-Partition League, Saor Uladh and Sinn Fein in relation to the partition issue. Other themes of the module include Unionism and Loyalism, special powers and civil rights, Official and Provisional IRA, 'Bloody Sunday', counterinsurgency, Long Kesh and paramilitary imprisonment, Hunger Strikes, 'Ulsterization' and 'The Long War', Section 31, and the origins of the Peace Process.

HI4152 - FROM KINGDOM TO REPUBLIC: IRISH HISTORY, 1660-1960
ECTS Credits: 6

History

Rationale and Purpose of the Module: This general history module will provide those with little or no prior experience of history with an overview of Irish society and politics from c.1660 to 1960. It is ideal for the general arts student, the international student and those who wish to have a general introduction to Irish history. This is to be offered to students of the new BA Arts.

Syllabus: Defining Ireland; economy, society and class; women and politics; the Three Kingdoms; the Boyne and the emergence of a protestant ascendancy; agrarian society in pre famine Ireland; the Famine: dealing with the catastrophe; patriots, nationalists, republicans, unionists, and others; politics and its followers; origins of independence; constitutional developments and the two states of Ireland; economic development; population and social change; education and language; the evolution of popular culture; the Irish diaspora.

HI4127 - UNDERSTANDING THE HOLOCAUST IN 20TH CENTURY EUROPE
ECTS Credits: 6

History

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

Syllabus: Introduction to the course: war, revolution, restoration 1848-1924; 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; conservativism/fascism/Stalinism; the twenty-year crisis: international relations; the Nazi new order and total war; Holocaust; reconstruction/Cold War 1944-74; 1945; Europe’s ‘zero hour’ re-establishing order: Europe's political divisions; recovery, growth, and limits: the European economy; seducing Europeans: mobility, consumerism, and culture; the ‘second sex’; 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 ‘Europe’ and Union.
HI4187 - HEALTH, STATE AND IRISH MEDICAL CARE, 1837 - 1948
ECTS Credits: 6

History
Rationale and Purpose of the Module: The aim of this course is to provide students with an introduction to major issues, approaches and sources in the history of medicine from the Poor Law 1837 to the ‘Mother and Child scheme’ debacle in 1948

Syllabus: This module traces the evolution of Irish healthcare provision from the Poor Law in 1837 to the introduction of the Mother and Child Scheme in 1948, it will highlight the complexity of nineteenth-century Irish administration and will focus on how the dual system of public and private healthcare and its services emerged; major health concerns which dictated the shape the system such as outbreaks of cholera, typhus and pulmonary tuberculosis; lunacy acts; sanitation law; housing acts; the contagious diseases acts and their implementation and implications for health; the foundation of the Irish Free State and its relationship with the Catholic hierarchy invoked more change in the healthcare sector; issues of social class and healthcare; British policy and technological advances will be highlighted from a comparative perspective.

HI4237 - THE MODERN MIDDLE EAST AND THE ARAB-ISRAELI CONFLICT
ECTS Credits: 6

History
Rationale and Purpose of the Module: The Arab-Israeli Conflict is likely one of the most relevant in the contemporary world. This conflict has fascinated and puzzled scholars, politicians and the broader public creating the impression that everyone has an opinion about it. There is not only interest but it also seems that everyone has a recipe to find a lasting solution to this conflict: interestingly most of these solutions are conflicting if not diametrically opposed. This course will explore and discuss the causes and consequences of the major wars and we will place them in their local and international context.

Syllabus: Palestine under the Ottomans; World War One, the Balfour Declaration and the Peace Settlements; 3 The British Mandate; Competing Nationalism: Zionism and Arab Nationalism; 1948 The War for Palestine; Palestinian Refugees and the Status of Jerusalem; Suez Canal Crisis: the Cold War, Nasser and the Conflict; Road to 1967: war of attrition; The paradox of Peace: the October War 1973; Camp David: Cold War and Oil concerns; Lebanon Civil War and the wider region; Israeli policies and the First Intifada; Creating a ‘Peace Process’: from Madrid to Oslo; Camp David II and the Second Intifada; Simulation: Hope for Peace?

------------------------------------------------------------

HI4062 module on Court Politics and Culture in Early Modern Spain, 1561-1665.

Rationale and Purpose of the Module: The aim of this course is to provide students with an introduction to major issues, approaches and sources in the history of medicine from the Poor Law 1837 to the ‘Mother and Child scheme’ debacle in 1948

Syllabus: This module traces the evolution of Irish healthcare provision from the Poor Law in 1837 to the introduction of the Mother and Child Scheme in 1948, it will highlight the complexity of nineteenth-century Irish administration and will focus on how the dual system of public and private healthcare and its services emerged; major health concerns which dictated the shape the system such as outbreaks of cholera, typhus and pulmonary tuberculosis; lunacy acts; sanitation law; housing acts; the contagious diseases acts and their implementation and implications for health; the foundation of the Irish Free State and its relationship with the Catholic hierarchy invoked more change in the healthcare sector; issues of social class and healthcare; British policy and technological advances will be highlighted from a comparative perspective.

------------------------------------------------------------

HS4003 - OCCUPATIONAL HYGIENE 1
ECTS Credits: 6
Chemical Sciences

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

To further develop the students' awareness of the occupational hygiene approach to hazard recognition, evaluation, monitoring and control in respect of selected chemical and physical hazards.

To enhance the students skills in the use of appropriate measuring equipment and evaluation of findings in the context of occupational exposures.

Syllabus: [Hazards]: recognition, measurement & evaluation control; [Survey design]: personal monitoring, area monitoring, surface monitoring [Chemical hazards]: Atmospheric Dust & fumes, active/inert, total/respirable fraction, occupational exposure levels, time-weighted average of exposure, analytical techniques. Gases/Vapours, active versus passive sampling, sampling techniques, direct reading instruments, units of concentration, control of airborne contaminants, ventilation, dilution ventilation, number of air changes, local exhaust ventilation, collection devices, ducting, fans, capture velocity, transport velocity. Safety technologies and personal protective equipment. [Physical hazards]: Noise, sound, sound frequency, wavelength, sound power, sound pressure, intensity, sound levels in practice, sound weighting, statistical noise levels, LAeq, LApd, sound measurement techniques, sound radiation, Noise control, absorption, reduction, enclosures, noise barriers, hearing protection, audiometry. Safety technologies and personal protective equipment. [Relevant Legislation and Codes of Practice]

------------------------------------------------------------

HS4062 - OCCUPATIONAL HYGIENE 2
ECTS Credits: 6
Chemical Sciences

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

To further develop the students' awareness of the occupational hygiene approach to hazard recognition, evaluation, monitoring and control in respect of selected chemical and physical hazards.

To enhance the students skills in the use of appropriate measuring equipment and evaluation of findings in the context of occupational exposures.

Syllabus: [Hazards]: recognition, measurement & evaluation control; [Survey design]: personal monitoring, area monitoring, surface monitoring [Chemical hazards]: Atmospheric Dust & fumes, active/inert, total/respirable fraction, occupational exposure levels, time-weighted average of exposure, analytical techniques. Gases/Vapours, active versus passive sampling, sampling techniques, direct reading instruments, units of concentration, control of airborne contaminants, ventilation, dilution ventilation, number of air changes, local exhaust ventilation, collection devices, ducting, fans, capture velocity, transport velocity. Safety technologies and personal protective equipment. [Physical hazards]: Noise, sound, sound frequency, wavelength, sound power, sound pressure, intensity, sound levels in practice, sound weighting, statistical noise levels, LAeq, LApd, sound measurement techniques, sound radiation, Noise control, absorption, reduction, enclosures, noise barriers, hearing protection, audiometry. Safety technologies and personal protective equipment. [Relevant Legislation and Codes of Practice]

------------------------------------------------------------

HS4003 - OCCUPATIONAL HYGIENE 1
ECTS Credits: 6
Chemical Sciences

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

To further develop the students' awareness of the occupational hygiene approach to hazard recognition, evaluation, monitoring and control in respect of selected chemical and physical hazards.

To enhance the students skills in the use of appropriate measuring equipment and evaluation of findings in the context of occupational exposures.

Syllabus: [Hazards]: recognition, measurement & evaluation control; [Survey design]: personal monitoring, area monitoring, surface monitoring [Chemical hazards]: Atmospheric Dust & fumes, active/inert, total/respirable fraction, occupational exposure levels, time-weighted average of exposure, analytical techniques. Gases/Vapours, active versus passive sampling, sampling techniques, direct reading instruments, units of concentration, control of airborne contaminants, ventilation, dilution ventilation, number of air changes, local exhaust ventilation, collection devices, ducting, fans, capture velocity, transport velocity. Safety technologies and personal protective equipment. [Physical hazards]: Noise, sound, sound frequency, wavelength, sound power, sound pressure, intensity, sound levels in practice, sound weighting, statistical noise levels, LAeq, LApd, sound measurement techniques, sound radiation, Noise control, absorption, reduction, enclosures, noise barriers, hearing protection, audiometry. Safety technologies and personal protective equipment. [Relevant Legislation and Codes of Practice]

------------------------------------------------------------

HS4003 - OCCUPATIONAL HYGIENE 1
ECTS Credits: 6
Chemical Sciences

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

To further develop the students' awareness of the occupational hygiene approach to hazard recognition, evaluation, monitoring and control in respect of selected chemical and physical hazards.

To enhance the students skills in the use of appropriate measuring equipment and evaluation of findings in the context of occupational exposures.

Syllabus: [Hazards]: recognition, measurement & evaluation control; [Survey design]: personal monitoring, area monitoring, surface monitoring [Chemical hazards]: Atmospheric Dust & fumes, active/inert, total/respirable fraction, occupational exposure levels, time-weighted average of exposure, analytical techniques. Gases/Vapours, active versus passive sampling, sampling techniques, direct reading instruments, units of concentration, control of airborne contaminants, ventilation, dilution ventilation, number of air changes, local exhaust ventilation, collection devices, ducting, fans, capture velocity, transport velocity. Safety technologies and personal protective equipment. [Physical hazards]: Noise, sound, sound frequency, wavelength, sound power, sound pressure, intensity, sound levels in practice, sound weighting, statistical noise levels, LAeq, LApd, sound measurement techniques, sound radiation, Noise control, absorption, reduction, enclosures, noise barriers, hearing protection, audiometry. Safety technologies and personal protective equipment. [Relevant Legislation and Codes of Practice]
IN4003 - PRINCIPLES OF RISK MANAGEMENT
ECTS Credits: 6

Accounting & Finance

Rationale and Purpose of the Module: To introduce the students to concepts and principles relating to the management of risk. The role of risk management in corporate and institutional decision making will be emphasized. Students will be introduced to the concepts of risk management, the management of risk in both the public and private sector and to the complexity of risk management strategies. Risk management is a decision making process that involves identification, analysis, evaluation, control, financing of risk and management in an organisation and in the public sector. The module will introduce students to the role of insurance within the health market. Furthermore, this module seeks to raise awareness of global issues such as public health, natural disasters, terrorism etc. and the mitigating role of risk management and insurance.

Syllabus: Concepts of risk, pure and speculative risk; actuarial mathematics and elementary risk theory; perceptions of risk; risk in the economic and legal environment; models of risk management; risk management as a decision making process, identification, analysis, evaluation, control, financing of risk; risk management in an organisation and in the public sector; formulation and implementation of risk management strategies; quality and risk management.

IN4005 - RISK ANALYSIS
ECTS Credits: 6

Accounting & Finance

Rationale and Purpose of the Module: 1. To develop in the student an understanding of and insight into risk analysis. 2. To examine the nature of the interface between the corporate risk management function and the insurance sector. 3. To introduce students to the theory and practice of risk analysis and to acquaint students with the complex and rapidly changing environment within which risk managers operate.


IN4007 - GOVERNANCE AND RISK
ECTS Credits: 6

Accounting & Finance

Rationale and Purpose of the Module: To develop in the student an understanding of and insight into the concepts of governance and risk. To examine the nature of the interface between governance structures and risk management practices.

Syllabus: The students will gain a general understanding of risk and governance and produce an in depth analysis of specific examples. The content will address risk and governance from a number of disciplinary perspectives including accounting, regulation and legal.

IN4015 - RISK AND INSURANCE
ECTS Credits: 6

Accounting & Finance

Rationale and Purpose of the Module: To meet the needs of the risk management and insurance industry by providing students with a strong understanding of how the insurance industry operates. Students will also learn the important principles underlying risk management. The interest in, and study of, risk has grown significantly due to improvements in the technology used to assess and measure risk and the development of innovations in the insurance and capital markets that control risk.

Prerequisites: IN4003

IN4427 - INSURANCE ORGANISATIONS AND MARKETS
ECTS Credits: 6

Accounting & Finance

Rationale and Purpose of the Module: To develop in the student an understanding of and insight into the management of an insurance organisation in the current economic and legal environment. To examine the nature of the interface between insurance organisations and regulators. To introduce students to the theory and practice of insurance institutions and to acquaint students with the complex and rapidly changing environment within which insurers operate. Stress will be given to the achievement of appreciation of recent developments in the field.

Syllabus: Develop in the student an understanding of and insight into the management of insurance organisations in the current, social, economic and legal environment. Examine the nature of the interface between insurance organisations and regulators. Introduce students to the theory and practice of insurance institutions and to acquaint students with the complex and rapidly changing environment within which insurers operate. Stress will be given to the achievement of appreciation of recent developments in the field.

Prerequisites: IN4003
Insurance is one of the main mechanisms used to control the insurance and capital markets that control risk and measure risk and the development of innovations in the insurance industry. Stress will be given to the insurance industry operates. Students will also learn the important principles underlying risk management. The interest in, and study of, risk has grown significantly due to improvements in the technology used to assess and measure risk and the development of innovations in the insurance and capital markets that control risk. Insurance is one of the main mechanisms used to control risk, through the transfer of that risk to a third party, usually an insurance company. The insurance company in turn is exposed to a variety of risks and can transfer some of these through reinsurance whilst other risks can be controlled using alternative markets. With the spiralling cost of health care and the changing demographic in Ireland and Europe there is significant focus on the health care market by the state and the insurance industry. This module will introduce students to the health care market by the state and the spiralling cost of health care and the changing demographic in Ireland and Europe.

**Syllabus:** The students will gain a general understanding of insurance organisations and markets and produce some in-depth analysis.

**Rationale and Purpose of the Module:** To develop the students' ability to understand, speak, read and write Japanese and to further their understanding of Japanese culture and society, particularly relating to the world of work.

**Syllabus:** Understanding of instructions, needs and wants, descriptions of events in order. Speaking exercises explaining actions in sequence, telling stories, making requests and asking permission. Reading more demanding and authentic passages about Japanese life and society. Written exercises concentrating on descriptions and narratives; also memos, letters and notes. Study of a further 170 kanji to bring the total up to 250 characters. Discussion of modern Japanese culture, literature and films.

**Prerequisites:** JA4212

**School of Modern Languages and Applied Linguistics**

**JA4213 - JAPANESE LANGUAGE, CULTURE AND SOCIETY 3**

**ECTS Credits:** 6

**Syllabus:** Listening practice leading to the recognition of numbers, times, days, dates, locations, greetings and questions. Conversation practice based on grammar structures and vocabulary necessary to use greetings, introduce oneself politely, ask basic questions, explain schedules, and talk about pastimes. Reading practice progressing from the understanding of notices and posters to descriptions of peoples everyday lives. Writing practice introducing the hiragana and katakana writing systems and 80 kanji progressing to being able to write passages involving self-introduction, daily routines, hobbies, and shopping. Reading and discussion in English about Japanese customs, culture and society.

**Rationale and Purpose of the Module:** To consolidate further students' ability to understand, speak, read and write Japanese and to further their understanding of Japanese culture and society, particularly relating to the world of work.

**School of Modern Languages and Applied Linguistics**

**JA4247 - JAPANESE LANGUAGE, CULTURE AND SOCIETY 5**

**ECTS Credits:** 6

**Syllabus:** To provide a firm grounding in understanding, speaking, reading and writing basic Japanese, and aspects of Japanese culture and society, as well as to begin to develop life-long language learning strategies with learners.

**Rationale and Purpose of the Module:** This module
consolidates and extends students' abilities in listening and reading, spoken and written intermediate level Japanese. It also introduces translation from Japanese to English of a variety of literary and other contemporary texts.

**Syllabus:** Listening practice consolidating functions and vocabulary studied up to now; authentic listening from a variety of sources. Speaking practice involving further use of polite language; presentations about work experience and current affairs; spoken summaries of broadcast and reading material at various levels. Reading of authentic or near-authentic passages at intermediate level. Translation of a variety passages into English. Writing practice involving summaries, descriptions, and letters of various levels of formality. Study of a further 170 kanji, to bring the total to 550 characters. Introduction of authentic material by modern Japanese authors.

**Prerequisites:** JA4246

---

**JA4911 - JAPANESE FOR BUSINESS 1**

**ECTS Credits:** 6

**School of Modern Languages and Applied Linguistics**

**Rationale and Purpose of the Module:** To provide a firm grounding in understanding, speaking, reading and writing basic Japanese, and aspects of Japanese culture and society, as well as to begin to develop life-long language learning strategies with learners.

**Syllabus:** Listening practice leading to the recognition of numbers, times, days, dates, locations, greetings and questions. Conversation practice based on grammar structures and vocabulary necessary to use greetings, introduce oneself politely, ask basic questions, explain schedules, and talk about pastimes. Reading practice progressing from the understanding of notices and posters to descriptions of peoples everyday lives. Writing practice introducing the hiragana and katakana writing systems and 80 kanji progressing to being able to write passages involving self-introduction, daily routines, hobbies, and shopping. Reading and discussion in English about Japanese customs, culture and society.

---

**JA4913 - JAPANESE FOR BUSINESS 3**

**ECTS Credits:** 6

**School of Modern Languages and Applied Linguistics**

**Rationale and Purpose of the Module:** To consolidate further students' ability to understand, speak, read and write Japanese and to further their understanding of Japanese culture and society, particularly relating to the world of work.

**Syllabus:** Understanding of instructions, needs and wants, descriptions of events in order. Speaking exercises explaining actions in sequence, telling stories, making requests and asking permission. Reading more demanding and authentic passages about Japanese life and society. Written exercises concentrating on descriptions and narratives; also memos, letters and notes. Study of a further 170 kanji to bring the total up to 250 characters. Discussion of modern Japanese culture, literature and films.

**Prerequisites:** JA4912

---

**JA4915 - JAPANESE FOR BUSINESS 5**

**ECTS Credits:** 6

**School of Modern Languages and Applied Linguistics**

**Rationale and Purpose of the Module:** To consolidate students' abilities to comprehend, read, speak and write Japanese developed up to now and to develop further their ability to deal with material relating to Japanese culture and business particularly in the world of work.

**Syllabus:** Listening comprehension, particularly authentic news broadcasts about business topics; readings about contemporary Japanese life and business; spoken exercises, particularly short presentations and workplace-related conversations; writing of short reports and summaries as well as students' own opinions on everyday topics.

**Prerequisites:** JA4914

---

**JA4917 - JAPANESE FOR BUSINESS 7**

**ECTS Credits:** 6

**School of Modern Languages and Applied Linguistics**

**Rationale and Purpose of the Module:** This module consolidates and extends students' abilities in listening and reading, spoken and written intermediate level Japanese. It also introduces translation from Japanese to English of a variety of literary and other contemporary texts.

**Syllabus:** Listening practice consolidating functions and vocabulary studied up to now; authentic listening from a variety of sources. Speaking practice involving further use of polite language; presentations about work experience and current affairs; spoken summaries of broadcast and reading material at various levels. Reading of authentic or near-authentic passages at intermediate level. Translation of a variety passages into English. Writing practice involving summaries, descriptions, and letters of various levels of formality. Study of a further 170 kanji, to bring the total to 550 characters. Introduction of authentic material by modern Japanese authors.

**Prerequisites:** JA4915

---

**JM4003 - INTERVIEWING AND REPORTING**

**ECTS Credits:** 6

**School of Culture and Communication**

**Rationale and Purpose of the Module:** Interviewing and reporting aims to develop students skills at researching and carrying out interviewing face to face and by telephone, and covering a patch as for a local newspaper.

**Syllabus:** Students will study interviewing in depth, learning how to select interview subjects, research topics and prepare for the interview. They will carry out a face-to-face interview with a newsmaker in class, reflect on that interview and the ones by fellow classmates, and write up both their own and classmates interviews as news stories. They will research and carry out a telephone interview. During the second half of the semester students will be assigned to a local patch, from which they will, with the guidance of the tutor, produce a portfolio including a report on the area, off diary and on diary stories and short features, with suitable pictures.
This material must be designed into pages for a dummy local paper. Classes throughout the semester will include revision on news writing as the students develop and polish their stories. Assessment will be by coursework: production of a portfolio of interviews and a folder of work from the students patch, and a timed exam on news writing and editing.

JM4008 - INVESTIGATIVE JOURNALISM
ECTS Credits: 6

School of Culture and Communication

Rationale and Purpose of the Module: The Investigative Journalism module aims to give students an insight into how to conceive, research and write a piece of investigative journalism to professional standards.

Syllabus: Students will originate an idea, and under the guidance of the tutor will develop it, research it using printed sources and the internet, compile a list of interview subjects and carry out at least two face to face interviews. The research will end in a 2,000 word investigative news feature, with background fact boxes and other material if relevant. The feature must be designed into a spread or spreads appropriate to the style of that publication. A research journal of at least 500 words will be kept. It will record how the research was carried out, what difficulties were encountered, and will include contacts of the interviewees for checking. Assessment will be by the individual students contributions to the final project.

JM4009 - JOURNALISTIC WRITING FOR NEWS
ECTS Credits: 6

School of Culture and Communication

Rationale and Purpose of the Module: Introduction to Journalism has aims to introduce students to the broad range of writing in journalism alongside a grounding on core issues of Journalism theory and practice

The module will introduce a broad range of writing skills from newspapers to magazines of all types, both print and online. It aims to teach students to write short news stories for a variety of publications, including local and national newspapers and websites. This will include an introduction to journalistic ethics.

Syllabus: Students will learn the core theories of journalism structures and practice, this will inform students both of existing and changes in structures and practice in the ever changing field. This will include an introduction to journalistic ethics.

In the practical labs students will learn the principles of news reporting, including grammar and working to a style book. They will learn by comparing reports in national and local newspapers and magazines. They will have extensive practice in creating news stories. They will learn to report from speakers, radio and TV programmes and documents and will practise writing intros and structuring a news story both for print and the internet. They will learn about newsroom practices and journalistic routines. They will consider the work of leading news and feature writers and their distinct styles. They will write short profiles of people in the news.

Assessment will be by the production of a portfolio of work completed during the course, and a final timed examination.

JM4037 - INDIVIDUAL JOURNALISM PROJECT AND PORTFOLIO 1
ECTS Credits: 6

School of Culture and Communication

Rationale and Purpose of the Module: The individual project aims to help students in-depth reporting, comma writing and design skills through work on a subject of their own choice. It aims to help them project an extended piece of journalism with appropriate research.

Syllabus: Students will choose and research a subject of their choice using all available resources and personal interviewing. They will be guided by a supervisor to ensure their research will be adequate to produce a 4,500 word extended journalism product, either as one piece, or a group of related pieces. Students will also be required to produce a 30-minute radio documentary OR a 10-minute television documentary OR a multimedia project on this or a related topic, or a series of shorter packages. A target publication and broadcast outlet must be identified. The final work will be designed for print / web / edited for broadcast as appropriate and presented as part of a portfolio of publications produced while a BA student. Students should conduct a series of interviews as appropriate and follow ethical guidelines and use on-the-record sources.

JM4047 - JOURNALISM TEAM PROJECT 1
ECTS Credits: 6

School of Culture and Communication

Rationale and Purpose of the Module: The Team Project aims to polish students reporting, writing and designing skills to a professional level. It will enhance their ability to work in a team and to meet deadlines. It will allow students to develop problem solving skills. This module will prepare students for Journalism Team Project 2 where students will produce a one off newspaper or magazine.

Syllabus: Students will establish a news room structure with students assigned various roles such as editors, layout designers and beat reporters. Students will develop and practice the structures by producing a rolling news web site. They will develop the concept to publication producing a reader profile and a business case. Students will write news and original features and other material, source pictures, design pages and edit accurately. The final submission will include a statement from each student about what s/he wrote, details of his or her role in the production, and contacts for the sources for the written pieces.

Assessment will be by the individual students contributions to the final project.

JM5011 - JOURNALISTIC WRITING FOR NEWS
ECTS Credits: 9

School of Culture and Communication

Rationale and Purpose of the Module: Journalistic Writing News aims to equip students to tackle a broad range of news stories, including stories from interviews, documents, radio and television and lectures and speeches. It will introduce students to different styles of writing for different media.

Syllabus: Students will learn the principles of news reporting, including grammar and working to a style book. They will learn by comparing reports in national and local newspapers and magazines. They will have extensive practice in creating news stories. They will learn to report from different sources and will practise writing intros and structuring a news story both for print and the internet. They will learn about interviewing, and will practice interviewing both in class and on their own.
They will learn about newsroom practices, journalistic routines writing to deadlines. Assessment will be by the production of a portfolio of work completed during the course, and a final timed examination.

---

**JM5061 - INTRODUCTION TO BROADCAST JOURNALISM**

**ECTS Credits:** 3

**School of Culture and Communication**

**Rationale and Purpose of the Module:** This module is being created to introduce broadcast journalism to the Graduate Diploma/MA in Journalism programme in Semester 1 in light of feedback from media professionals, and to improve the current and future employment prospects of the students. The purpose of the module is to give students an historical perspective on radio and to develop their professional practice skills in broadcasting.

**Syllabus:** The module examines the current organisational structures of radio in Ireland and it analyses the changes that have come about in broadcast journalism. The impact of broadcast journalism on democracy is also examined. The module examines radio research techniques, interviewing for audio and scriptwriting. Practical classes focus on the development of professional journalism practice skills for audio-based outputs and web casting. These classes are held in the radio studio and in a dedicated newsroom. Writing and presentation skills for radio, telephone recording procedures and editing of audio and visual reportage are examined.

---

**LA4013 - MEDIA LAW**

**ECTS Credits:** 6

**Law**

**Rationale and Purpose of the Module:** This course aims to make students fully aware of the legal framework and constraints within which the media operates, and to enable them to cover courts and other stories with legal implications effectively and with confidence. It also aims to make students fully aware of the major ethical issues that concern journalists. Students will be able to form judgments about ethical dilemmas and articulate a response to them.

**Syllabus:** The structure of the legal system, with specific relevance to the law as it affects journalists, including defamation, malicious falsehood, criminal libel, blasphemy, contempt of court, reporting restrictions, breach of confidence and copyright. The course will introduce students to major sources (individuals, institutions, campaigning bodies, government bodies, journalists, journals) on media law issues. Students will analyze complex legal issues and be able to apply them to specific legal dilemmas. The course will cover recent developments in the laws on privacy and in particular European human rights legislation. Students will be introduced to the ethical framework surrounding journalism, including the various codes of conduct, and touching on laws such as those of privacy. They will discuss issues of public interest and its bearing on private lives, and the importance of truth, fairness and objectivity. There will be discussions on reporting suicide, mental health issues, questions of taste and decency, and the use of subterfuge to obtain stories, and the questions of sleaze and sensationalism. Representation of women and minorities in the press will be covered, as will the impact of competition, ownership and advertising on journalism. Assessment will be by examination and coursework essay.
LA4022 - COMMERCIAL LAW  
ECTS Credits: 6

Law

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


LA4033 - LAW OF THE EUROPEAN UNION 1  
ECTS Credits: 6

Law

Rationale and Purpose of the Module: The aim of the module is to equip the student with an understanding of the legal and policy issues surrounding EU law - an area of law that is attracting increasing attention and controversy at both a national and international level. In addition to affording students a broad understanding of the various sources of housing law in Ireland, the module will consider the policy implications of housing and homelessness. The module seeks to introduce students to key areas of legal study including social housing and the Housing Acts, landlord and tenant law and the Residential Tenancies Acts.

As well as meeting the needs of our undergraduate students, the introduction of a module focused on Housing Law and Policy responds to a clear educational need as identified by those in the Community Education & Volunteer sector (initially the Community Law and Mediation Group, see http://www.communitylawandmediation.ie/). Collaborating with partners such as CLM and meeting their educational needs (by also delivering the module online, see below), enables UL to support its local and regional communities. Such engagement moreover supports the University of Limerick in achieving its Strategic Goals as identified in Broadening Horizons, particularly those in Theme 1.2 “Support our local and regional communities”.

The module will be offered on both the daytime and evening scheduled periods. However, the application form will not allow for both.

Syllabus: This module covers: an introduction to the historical, cultural and legal foundations of Irish housing law; the right to housing under Irish and international human rights law; social housing and the Housing Acts; property law including mortgage law; landlord and tenant law; Residential Tenancies Acts; housing liability; social policy considerations of housing law; homelessness.

LA4056 - HOUSING LAW AND POLICY  
ECTS Credits: 6

Law

Rationale and Purpose of the Module: The aim of this module is to provide students with an understanding of the legal and policy issues surrounding housing law - an area of law that is attracting increasing attention and controversy at both a national and international level. In addition to affording students a broad understanding of the various sources of housing law in Ireland, the module will consider the policy implications of housing and homelessness. The module seeks to introduce students to key areas of legal study including social housing and the Housing Acts, landlord and tenant law and the Residential Tenancies Acts.

As well as meeting the needs of our undergraduate students, the introduction of a module focused on Housing Law and Policy responds to a clear educational need as identified by those in the Community Education & Volunteer sector (initially the Community Law and Mediation Group, see http://www.communitylawandmediation.ie/). Collaborating with partners such as CLM and meeting their educational needs (by also delivering the module online, see below), enables UL to support its local and regional communities. Such engagement moreover supports the University of Limerick in achieving its

LA4063 - LGBT RIGHTS, RESISTANCE AND REDRESS: GENDER, SEXUALITY AND THE LAW IN IRELAND  
ECTS Credits: 6

Law

Rationale and Purpose of the Module: This course is designed to help students acquire the conceptual tools and affective dispositions required to engage in LGBT-inclusive analyses of Irish legislation and policy. The module first seeks to help students adopt a critical approach to traditional binary conceptions of gender and sex, as well as to heteronormativity, providing a foundation for informed analysis of historical and contemporary Irish legislation. In particular, students will be encouraged to consider the impact on LGBT inclusion of anti-discrimination and criminal legislation. Students will engage with key moments in the evolution of LGBT rights in Ireland, up to and including the passing of the Marriage Act 2015 and the Gender Recognition Act 2015.

Syllabus: Traditional gender and sex roles; the social construction of gender and biological sex; Gender variant and intersex communities in Ireland; sexual minorities in Ireland; the LGBT rights movement in Ireland; the politics of blood donations; the Campaign for Homosexual Law Reform; Incitement to Hatred Act 1989; Trans children and the Gender Recognition Act 2015; Employment Equality Legislation; The Civil Partnership Act 2010; the Marriage Act 2015; the politics of blood donations; the Gender Recognition Act 2015; The Prohibition of Incitement to Hatred Act 1999; Trans children and the right to self-identification; Inter-sex persons and the right to bodily integrity; Affirmative healthcare including the availability of PrEP; future challenges for the LGBT rights movements in Ireland; Hate crime in Ireland.
LA4068 - CRIME AND CRIMINAL JUSTICE  
ECTS Credits: 6

Law

Rationale and Purpose of the Module: The Crime and Criminal Justice module aims to critically evaluate the institutions and operation of the criminal justice system in comparative perspective. The module aims to introduce students to the main approaches and theories in the field of crime and criminal justice studies, and the mechanisms by which the criminal justice system responds to the incidence of crime. The module also examines the influence of the media influenced on public attitudes towards crime, criminal justice processes and sentencing, criminal justice policy making, reform and anti-crime initiatives.


LA4111 - CONTRACT LAW 1  
ECTS Credits: 6

Law

Rationale and Purpose of the Module: To provide the legal basis for the creation and enforcement of contracts and to examine what restrictions exist regarding freedom to contract.


LA4211 - CRIMINAL LAW 1  
ECTS Credits: 6

Law

Rationale and Purpose of the Module: To examine the general principles of criminal law through consideration of their ethical, social and legal dimensions.


LA4310 - LAW OF TORTS 1  
ECTS Credits: 6

Law

Rationale and Purpose of the Module: To evaluate critically the role of the law of torts in society, to examine the basic elements of a tort with particular emphasis on negligence and the defences thereto.


LA4073 - INTRODUCTION TO CRIMINAL JUSTICE  
ECTS Credits: 6

Law

Rationale and Purpose of the Module: The module aims to introduce students to the main approaches and theories in the field of crime and criminal justice studies, and the mechanisms by which the criminal justice system responds to the incidence of crime. It is a study of major components of criminal justice in Ireland, which include concepts of law and crime, the criminal justice process, and overview of criminal justice agencies, current criminal justice issues, interactions and conflicts between criminal justice agencies. The module also examines the influence of the media influence on public attitudes towards crime, criminal justice processes and sentencing, criminal justice policy making, reform and anti-crime initiatives.

LA4330 - LAW OF TORTS 1 (B)
ECTS Credits: 6

**Law**

**Rationale and Purpose of the Module:** To evaluate critically the role of the law of torts in society, to examine the basic elements of a tort with particular emphasis on negligence and the defences thereto.


------------------------------------------------------------

LA4430 - CONSTITUTIONAL LAW 1
ECTS Credits: 6

**Law**

**Rationale and Purpose of the Module:** Currently, the School of Law delivers 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 Public Law modules but will use the more commonly used name of Company Law. It will be to the advantage of students, and professional bodies and employers with which they deal, as the term Company Law bears the more commonly used term for the study of this area of law.

**Syllabus:** The aim of the module is to equip the student with an understanding and knowledge of the basic principles and rules of Irish company law, including; the concept of separate legal personality and exceptions thereto, corporate contracts, the nature of shares in private companies limited by share, the rights of shareholders, the remedies available to shareholders, the role of share capital and issues surrounding corporate borrowing and security. The policy reasons for individual rules are explained and the aim is to assist the students understanding of company law, as well as to facilitate knowledge of those technical rules.

------------------------------------------------------------

LA4530 - COMPANY LAW 1
ECTS Credits: 6

**Law**

**Rationale and Purpose of the Module:** 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 Public Law modules but will use the more commonly used name of Company Law. It will be to the advantage of students, and professional bodies and employers with which they deal, as the term Company Law bears the more commonly used term for the study of this area of law.

**Syllabus:** The aim of the module is to equip the student with an understanding and knowledge of the basic principles and rules of Irish company law, including; the concept of separate legal personality and exceptions thereto, corporate contracts, the nature of shares in private companies limited by share, the rights of shareholders, the remedies available to shareholders, the role of share capital and issues surrounding corporate borrowing and security. The policy reasons for individual rules are explained and the aim is to assist the students understanding of company law, as well as to facilitate knowledge of those technical rules.

------------------------------------------------------------

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.

------------------------------------------------------------

LA4810 - EQUITY AND TRUSTS 1
ECTS Credits: 6

**Law**

**Rationale and Purpose of the Module:** To examine the growth and development of equity, particularly equitable doctrines and equitable remedies available in the modern Court.

**Syllabus:** The nature of equity and historical development, maxims, equitable remedies - the injunction, specific performance, rescission, rectification, specific performance, estoppel. Equitable doctrines - conversion, election, satisfaction and ademption.

------------------------------------------------------------

LA4901 - PRINCIPLES OF LAW
ECTS Credits: 6

**Law**

**Rationale and Purpose of the Module:** Principles of Law is an introduction to law for non-law students

**Syllabus:** The module provides the student with a basic knowledge of the Irish legal system, the Irish Constitution, the legal profession in Ireland, sources of Irish law, European Union law, Criminal law and Tort law.

------------------------------------------------------------

LA5021 - MEDIA LAW
ECTS Credits: 9

**Law**

**Rationale and Purpose of the Module:** This course aims to make students fully aware of the legal framework and constraints within which the media operates, and to enable them to cover courts and other stories with legal implications effectively and with confidence. It also aims to make students fully aware of the major ethical issues that concern journalists. Students will be able to form judgments about ethical dilemmas and articulate a response to them.

**Syllabus:** The 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.
LA6011 - INTERNATIONAL BUSINESS TRANSACTIONS
ECTS Credits: 6

Law

Rationale and Purpose of the Module: To build on the students’ knowledge and understanding of commercial transactions in a cross-border environment. The aim of this module is to expose students to a comprehensive understanding of the laws which govern international business transactions both at the micro and macro level. Students will gain a deeper knowledge of the legal issues arising in international contracts for the sale of goods and the international financial instruments which support such commerce.

The Grading type for this module is Normal. The level of Award is Level 9 and the module is to be centrally scheduled in the same manner as other taught postgraduate modules.

Syllabus: The module will examine the following legal issues that arise in international transactions:

- Import regulation: WTO regime; US Trade authorities; US import controls; free trade agreements; tariffs; classification, valuation and origin principles; non-tariff barriers
- Export regulation: Export controls from the US; export licenses; national security issues; exports to NAFTA jurisdictions; exports to EU jurisdictions
- Contextualising international trade: Anti-dumping and antidumping issues; Subsidies and countervailing subsidies; state trading entities; the Foreign Corrupt Practices Act and illegal payments abroad, US s.301 proceedings, and the US Boycott and Anti-Boycott rules.
- International Finance, including letters of credit and ETF Transactions; off-shore banking and tax efficiencies
- International Business Litigation and Dispute Resolution, arbitration and enforcement of arbitral awards; recognition and enforcement of foreign awards, including a documentary analysis.
- Overseas investment, including investment in the EU, developing countries and investments in NAFTA members. Expropriation of overseas investments. Ethical investment policy.

LA6021 - LAW OF INTERNATIONAL BUSINESS ASSOCIATIONS
ECTS Credits: 9

Law

Rationale and Purpose of the Module: The aim of this module is to familiarise students with modern corporate structures and their legal regulation.

Syllabus: An overview of the historical development of the corporate structure in western commercial law from the early state based trading corporations to the rise of private enterprise units. This will be coupled with an introduction to theoretical frameworks of business structures and their legal regulation.

LA6031 - LAW OF INTERNATIONAL TRADE ORGANISATIONS
ECTS Credits: 9

Law

Rationale and Purpose of the Module: The aim of this module is to expose students to a comprehensive understanding of the global trading environment and the legal institutions, laws, rules and regulations that apply to cross border transactions.

Syllabus: This course will introduce students to the historical evolution of the legal provisions, relating to international trade, ranging from the Hanseatic League up to the period after World War II which establishes the modern global trading environment. It will briefly discuss the differing theories of international trade. The course will then examine the following institutions, their legal basis and operation and their legal control over international trade.

1. The WTO, its precursor (GATT) the establishing Treaty and the rules on accession and secession, the governance structure of the organisation, the interaction of its decisions and rules with national laws and the role it plays in dispute resolution between signatory states.
2. Regional trading organisations such as NAFTA (North American Free Trade Association) and the EU (European Union), in particular the legal basis of establishment, the interaction between national laws and the role of the regional trading organisation as arbiter, the process of dispute resolution between members of the regional organisation and the hierarchy of laws and issues of primacy between competing regulations.

3. UN bodies engaged in assisting the development of international trade, including UNCTAD (United Nations Conference on Trade and Development) and the EU approach, their role and function and the extra-territoriality of their legal powers. Finally the course will look at ethical and sustainable development and the role of the World Trade Organisation.

4. National enforcement agencies, such as CBP (Customs and Border Protection (USA)) and the EU approach, their role and function and the extra-territoriality of their legal powers. Finally the course will look at ethical and sustainable movements in international trade and their incorporation into national and regional legal systems.

### LA6051 - PENOLOGY AND VICTIMOLOGY
ECTS Credits: 9

**Law**

**Rationale and Purpose of the Module:** The purpose of this course is to provide students with an understanding of punishment, criminal justice and social regulation. In particular the aims of the module are as follows: to provide analyses of the primary penal disposals (both contemporary and historical) utilised in society; to highlight the various political, social, cultural and economic determinants that underpin the provision of penal dispositions; to encourage theorisation about punishment and penal responses; to highlight the needs and concerns of victims of crime; to determine how change is possible in the penal complex - in particular, how sanctions are modified or supplanted and how stakeholders, such as victims, emerge; to examine new 'logics' and 'discourses' on punishment and justice as they emerge; and, to provide a framework of understanding modern penal systems and the forms of social organisation in which they operate.

**Syllabus:** This module covers the emergence of penal welfarism and individualisation of treatment, the culture of control in late modern society, the emergence of prison and the disciplinary society, issues such as exclusion, governance, and expressive punishments, the politicisation of law and order, the return of the victim, Norbert Elias and the civilising society; Emile Durkheim and social solidarity; Cohen's dispersal of discipline thesis, and crime and punishment in Ireland.

### LA6071 - ADVANCED CONSTITUTIONAL LAW: JUDICIAL POWER AND CONSTITUTIONAL INTERPRETATION
ECTS Credits: 9

**Law**

**Rationale and Purpose of the Module:** This module will investigate constitutional theory and the role of judges in interpreting the Irish Constitution. The aim is to engage students in a critical analysis of contemporary issues in Irish constitutional law by examining issues such as the role of judges under the Constitution as well as the intersection between law and politics in this context. The module is designed to encourage critical thinking in relation to questions on the Constitution and vindication of rights and students will engage with both legal and political literature on these topics. Overall, students will advance their analytical skills and develop their capacity to reflect critically and engage in in-depth discussion on competing theories of constitutional interpretation, the role of the courts in our political system and analysis of judicial power and activism. In doing so, they will gain a deeper appreciation of constitutional theory.

**Syllabus:** The role of the judge under the Constitution, Judicial activism and Constitutional review, (Constitutional) Judicial review as a means of protecting rights, (Constitutional) Judicial review and political questions, Socio-economic rights, Constitutional interpretation, Constitution as a living document, Judicial power and democracy, Protecting Judicial Independence, The need for diversity in the judiciary, Feminist judgments.

### LA6101 - INTERNATIONAL BUSINESS TRANSACTIONS
ECTS Credits: 9

**Law**

**Rationale and Purpose of the Module:** To build on the students' knowledge and understanding of commercial transactions in a cross-border environment. The aim of this module is to expose students to a comprehensive understanding of the laws which govern international business transactions both at the micro and macro level. Students will gain a deeper knowledge of the legal issues arising in international contracts for the sale of goods and the international financial instruments which support such commerce. The Normal grading type is to apply to this module.

**Syllabus:** The module will examine the following legal issues that arise in international transactions:

- International contracts for the sale of goods, problems of formation, construction and enforcement, including e-commerce transactions, choice of law and jurisdiction issues.
- Import regulation: WTO regime; US Trade authorities; US import controls; free trade agreements; tariffs; classification, valuation and origin principles; non-tariff barriers
- Export regulation: Export controls from the US; export licenses; national security issues; exports to NAFTA jurisdictions; exports to EU jurisdictions
- Contextualising international trade: Anti-dumping and antitrust issues; Subsidies and countervailing subsidies; state trading entities; the Foreign Corrupt Practices Act and illegal payments abroad, US s.301 proceedings, and the US Boycott and Anti-Boycott rules.
- International Finance, including letters of credit and ETF transactions; off-shore banking and tax efficiencies
- International Business Litigation and Dispute Resolution, arbitration and enforcement of arbitral awards; recognition and enforcement of foreign awards, including a documentary analysis.
- Overseas investment, including investment in the EU, developing countries and investments in NAFTA members. Expropriation of overseas investments. Ethical investment policy
LA6111 - Criminal Justice Processes and Sentencing  
ECTS Credits: 9

Law  

Rationale and Purpose of the Module: The aim of this module is to provide a detailed understanding of criminal justice processes and sentencing procedures and to encourage students to question the place of human rights within that system. By the end of the course students should be familiar with the various stages in the processes in Ireland, be aware of the strengths and weaknesses, see how human rights should fit into that system and have knowledge of comparative systems.

Syllabus: This course will consider the various stages of the criminal justice process—from arrest, to trial, to sentence and the various disposal mechanisms. These will be analysed through a framework of human rights to identify the strengths and weakness of the different stages, and assess the compatibility of the Irish system with human rights obligations. What human rights are involved in the criminal justice system? How are the rights of the accused and of the victim balanced within the system? What challenges does the system face in an increasingly diverse Ireland? How can deficits in human rights standards be addressed? Other jurisdictions will be looked at as comparators in efforts to answer these questions.

--------------------------------------------

LA6121 - Law of the European Convention of Human Rights  
ECTS Credits: 9

Law  

Rationale and Purpose of the Module: This module aims to provide students with an understanding of the role and functioning of the principal element in the Council of Europe framework for human rights protection, through critically engaging with the underpinnings of the Convention and the vast body of Strasbourg case law.

Syllabus: The module will explore the influence and progress of the most developed regional mechanism for human rights protection. Convention rights will be examined on an article by article basis providing for a critical assessment of the development of each right and its treatment by the European Court of Human Rights. At the end of the course, students will be familiar with the articles and case law of the European Convention on Human Rights, and the additional Protocols and will have gained a comprehensive understanding of the practice and procedure of the European Court on Human Rights.

--------------------------------------------

LI4013 - LINGUISTICS 3: RESEARCHING LANGUAGE 1  
ECTS Credits: 6

School of Modern Languages and Applied Linguistics  

Rationale and Purpose of the Module: This module will be offered on the new BA Arts programmes. As part of the new BA, a pathway in Linguistics is being introduced. Linguistics modules are very popular electives and attract large numbers of registrations. A high number of students opt for a linguistics focussed final year project. As the modules are taught in English they are very popular choices also with Erasmus and study abroad students. These modules will all be made available as options on the current BA in Applied Languages, thus increasing student choices. The introduction of these new LI modules is therefore designed to meet the institutional strategic objectives of increased student choice and increased opportunities for internationalisation. This is the first of two modules designed to provide students with skills in the full range of approaches to studying language in society.

These skills are needed for three interrelated purposes: to complement the theories and principles that students are learning about in other modules and go provide them with the necessary skills to apply these to practical contexts; to equip students with the skills required to design and complete a language-focused final year project; to facilitate the student’s development as a life-long reflective researcher of language.

Syllabus: The module is practical in nature and will focus on two interrelated aspects: formulating research questions and on types and methods of data collection. The syllabus will be organised as follows: Selecting and formulating research questions in linguistics and sociolinguistics; types of data and methods of data collection - overview; 1. sociolinguistic interviews; 2. written surveys and questionnaires; 3. experimental methods; 4. linguistic landscapes; 5. computer-mediated data and methods.

Prerequisites: LI4212

--------------------------------------------

LI4016 - DISCOURSE ANALYSIS FOR ARTS, HUMANITIES & SOCIAL SCIENCES  
ECTS Credits: 6

School of Modern Languages and Applied Linguistics  

Rationale and Purpose of the Module: This module will be offered to all students on the new BA Arts programme; the module is also intended to be offered on an online basis to students in UL outside FAHSS and to external participants in an online format. Discourse analysis is a key methodological tool across all of the disciplines in AHSS and this module is designed to provide an interdisciplinary introduction for non-linguistics/language students from across the subject range on the new BA. The introduction of the module is designed to meet the strategic objectives of broadening the curriculum and increasing student choice.

Syllabus: The syllabus will be organised around the following components: Introduction to the module (Why study discourse? Discourse as data). Method 1: Corpus analysis; Method 2: Critical Discourse Analysis. Students will design and carry out a project in their own discipline to apply each of these research methods, one quantitative (corpus analysis) and one qualitative (cricial discourse analysis).

--------------------------------------------

LI4023 - LANGUAGE AND SOCIETY IN IRELAND  
ECTS Credits: 6

School of Modern Languages and Applied Linguistics  

Rationale and Purpose of the Module: This module will be offered on the new BA Arts programmes. As part of the new BA, a pathway in Linguistics is being introduced. Linguistics modules are very popular electives and attract large numbers of registrations. A high number of students opt for a linguistics focussed final year project. As the modules are taught in English they are very popular choices also with Erasmus and study abroad students. These modules will all be made available as options on the current BA in Applied Languages, thus increasing student choice. The introduction of these new LI modules is therefore designed to meet the institutional strategic objectives of increased student choice and increased opportunities for...
internationalisation. Linguistic variation is one of the key components of studying language in society; this module will offer students an introduction to this topic by focussing on the Irish sociolinguistic context in contemporary and historical perspective.

**Syllabus:** Following a general introduction to studying language and variation, the module will focus on four main themes:

1. Irish-English
2. The Irish language
3. Irish traveller language
4. The new languages of Ireland

---

**LI4211 - LINGUISTICS 1**  
*ECTS Credits: 6*

**School of Modern Languages and Applied Linguistics**

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

**Syllabus:** The module comprises four distinct but also interrelated themes, each of which will be dealt with in sequential blocks over the twelve week module:

1. Nature of language and linguistics: In this first part, students will be introduced to basic concepts in linguistics, including: language, duality, arbitrariness.
2. Phonetics & Phonology. In this second part, students will learn how to recognise and categorise the sounds of English and other languages.
3. Morpho-Syntax. In the third section, students will focus on how words are formed and how they combine to make sentences.
4. Semantics and Pragmatics: The final section of the module will focus on meaning and its relevance to the study of language.

---

**MA2121 - FOUNDATION MATHEMATICS 1**  
*ECTS Credits: 6*

**Mathematics & Statistics**

**Rationale and Purpose of the Module:** To provide a core of mathematics which is a significant mathematical experience for students. To provide students with an appropriate and sufficient mathematical foundation for further study of mathematics at higher education.

**Syllabus:** Introduction to the body as a whole, tissues, organs, system, and cavities of the body, filtration, and simple diffusion. Cells: Cellular structure, the cell surface, cytoplasm, Eukaryotic cell structure and function: Principal components, organelle structure and function, genome organization, cytoskeleton and membrane systems. Cellular differentiation and development:

- Cell cycle & cell division, specialised cell types, stem cells, morphogenesis and multicellularity.
- Muscles: Structure and function. The Central Nervous System: Meninges, ventricles and cerebrospinal fluid, blood supply and the brain barrier system, structure and function of the spinal cord, the midbrain, the pons varolii and cerebellum, the cerebrum, medulla oblongata, the limbic system. The Peripheral Nervous System and Reflexes: Classification and anatomy of nerves and nerve fibres, the cranial nerves, the spinal nerves, nerve plexuses, the nature of reflexes, components of a reflex arc. The Autonomic Nervous System: Anatomy of the sympathetic and parasympathetic division, functions of the autonomic nervous system, the adrenal glands, neurotransmitters and receptors.

---

**LS4003 - INTRODUCTORY ANATOMY AND PHYSIOLOGY**  
*ECTS Credits: 6*

**Biological Sciences**

**Rationale and Purpose of the Module:** To provide the foundation for understanding the anatomy and physiological functioning of the human system so as to assist in the study of the effects of illness and disease on the individual. To acquaint students without a biological background with the basic concepts of general Anatomy and Physiology while providing a detailed introduction into cellular and tissue biology.

**Syllabus:** Language teaching and learning in Ireland: historical developments; rational and EU language policy; the position of languages in Irish society; engendering openness to other cultures and languages; crosscurricular aspects of teaching languages.

Theoretical perspectives: theories of language, theories of language teaching and learning and resulting methodologies.

Planning: critical evaluation of language syllabi within the broader curriculum; syllabus implementation in the language classroom; alternative post-primary programmes (JCSP, LCE, LCA, LCVP, TYP).

The practice of language teaching: teaching vocabulary, pronunciation and grammar; balancing productive and receptive skills; culture and language; literature and film; developing cultural awareness; communicating perspectives on development issues; the multi-cultural classroom; sourcing, selecting, evaluating and managing teaching resources; traditional and new technologies in language teaching/learning; levels and differentiation; standard and alternative assessment models; marking, recording and reporting; task and project work; developing strategies for autonomous and collaborative language learning.

Classroom management: teaching through the target language; interaction patterns; elicitation; error correction, mixed ability classes.
systems in use; basic arithmetic facts and operations; using a calculator.
Numbers and number sense 2: fractions; percentages; ratio and proportion; more on calculators; approximation and estimation.

Algebra 1: algebra as generalized arithmetic; terms and expressions; simplifying algebraic expressions; simple equations and their solution; using formulae.
Measurement: standard units; unit conversions; accuracy and precision; everyday use.

Geometry: basic properties of angles, triangles, circle, polygons, 3-D figures; right angle triangles; symmetry.
Functions and graphs 1: concept of function; tables symmetry.

MA2131 - FOUNDATION ENGINEERING

MA4001 - ENGINEERING MATHEMATICS 1
ECTS Credits: 6

Mathematics & Statistics

ACADEMIC CONTENT IS NOT CURRENTLY AVAILABLE FOR THIS MODULE - UPDATES ARE IN PROGRESS

MA4003 - ENGINEERING MATHEMATICS 3
ECTS Credits: 6

Mathematics & Statistics

Rationale and Purpose of the Module: To introduce the student to the Laplace Transform, Fourier Series, and their use in solving Ordinary Differential Equations.


Prerequisites: MA4002

MA4005 - ENGINEERING MATHEMATICS T1
ECTS Credits: 6

Mathematics & Statistics

Rationale and Purpose of the Module: To review and reinforce the student’s understanding of and problem solving skills in the areas of

* Multivariate and Integral Calculus and Differential Equations.
* The Laplace Transform and Fourier Series and their use in solving Ordinary Differential equations.


LU-decomposition. Cholesky decomposition; iterative methods
Extension to nonlinear systems using Newton’s method

---

**MA4007 - EXPERIMENTAL DESIGN**

**ECTS Credits:** 6

**Mathematics & Statistics**

**Rationale and Purpose of the Module:** To familiarise students with the theory and applications of experimental design. Introduce the concepts of orthogonal functions and orthogonal arrays within experimental design. To analyse the Japanese method of experimental design and to compare it with traditional (linear models) design.

**Syllabus:** Multiple Regression, Residual analysis leverage and influence points.
Analysis of variance: Expanding one, two factors in orthogonal polynomials. Estimation of factorial effect, resolution of variation. robust techniques.

Statistical Experimental Design: Screening, factors, level, response groups, full and fractional factorials, composite design, orthogonal arrays, signal to noise ratio, blocking responses, full and fractional factorials, composite Experimental Design, parameter design, tolerance design.

Evolutionary Operations, response surface methodology, steepest ascent, canonical forms and the use of graphical techniques to classify surfaces.

**Prerequisites:** MA4004

---

**MA4113 - APPLIED BUSINESS MATHEMATICS**

**ECTS Credits:** 6

**Mathematics & Statistics**

**Rationale and Purpose of the Module:** This module contains the first half of MA4102 and of MA4103.

**Purpose:**
To introduce mathematical concepts and techniques, with applications in economics, finance and in business in general. To develop an appropriate foundation in mathematics for students from diverse mathematical backgrounds.

**Syllabus:** Review of algebra: fractions and rational expressions, linear equations and inequalities. Economic models: cost and revenue, supply and demand curves.

Simultaneous linear and quadratic equations (solved algebraically and graphically); applications to market equilibrium and break-even analysis.

Linear programming: plotting linear inequalities in two variables, feasible region, constrained optimisation; solving linear optimisation problems using the graphical method; applications to maximising profit/revenue, minimising cost etc.

Mathematics of finance: geometric sequences and series; applications to compound interest, present value, valuation of annuities and mortgages.

Matrices: definitions, matrix algebra: addition, subtraction, scalar multiplication, matrix product; determinants (2X2); matrix inversion; representing and solving linear systems using matrices.

Functions and their graphs: definition of a function (including function of several variables), combining functions, inverse functions; graphs of linear, quadratic, cubic polynomials; roots and factors; negative powers and rational powers.

Exponents and logarithmic functions: laws of exponents and rational powers.

* To develop and integrate the basic mathematical skills relevant to science.

**Syllabus:** [Vectors:] definition; addition; components, resultant, position vector; scalar product; dot product and angle between vectors; cross product; simple applications in mechanics.

[Trigonometry:] basic definitions and relation to unit circle; basic formulae and identities; frequency, amplitude and phase.

[Linear equations:] solution of systems of linear equations by Gaussian elimination; examples with a unique solution, an infinite number or no solutions.

[Matrices:] Addition and multiplication; matrix inversion; simple determinants.

[Functions:] graphs and functions; polynomial and algebraic functions; curve-fitting; least-squares approximation (formula only); exponential and logarithm; inverse function.

[Derivative and applications:] basic concepts: slope as rate of change; differentiation of sum, product, quotient; chain rule; derivative of standard functions; tangent and normal; higher derivatives; maxima and minima; applications to optimisation in science.

---

**MA4601 - SCIENCE MATHEMATICS 1**

**ECTS Credits:** 6

**Mathematics & Statistics**

**Rationale and Purpose of the Module:** To introduce students to the fundamental concepts of calculus and linear algebra.
To develop and integrate the basic mathematical skills relevant to science.

**Syllabus:** Derivative and applications: basic concepts; slope as rate of change; differentiation of sum, product, quotient; chain rule; derivative of standard functions; tangent and normal; higher derivatives; maxima and minima; applications to optimisation in science.

---

**MA4603 - SCIENCE MATHEMATICS 3**

**ECTS Credits:** 6

**Mathematics & Statistics**

**Rationale and Purpose of the Module:** To introduce students to the fundamental ideas of uncertainty through probability.
To introduce students to the most widely used statistical distributions and applications thereof.
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 (sensitivity and specificity); Introduction to random variables; probability density functions; Special distributions: binomial, normal; Statistical inference: point and interval estimates, density functions; Special distributions: binomial, 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; Relationships between quantitative variables: Pearson’s correlation coefficient; Regression analysis.

MA4605 - CHEMOMETRICS
ECTS Credits: 6

Mathematics & Statistics
Rationale and Purpose of the Module: To give students a clear understanding of the importance of statistical methods in their work.

To introduce students to the most widely used statistical techniques in the chemical process industries.

To develop skills in the use of these techniques through actual case studies using statistical software packages


Design of experiments and analysis of variance - one and two way ANOVA, interaction, factorial designs, responses and factors, Plackett-Burman design, response surface methodology.

Prerequisites: MA4603

MA4617 - INTRODUCTION TO FLUID MECHANICS
ECTS Credits: 6

Mathematics & Statistics
Rationale and Purpose of the Module: Change of title for existing module MA4607

INTRODUCTION TO APPLIED MATHEMATICAL MODELLING IN CONTINUUM MECHANICS. Content remains the same. Update of prerequisite module and lab hour added.

To provide an introduction to the basic concepts of the mathematical modelling of fluid mechanics.

Syllabus: Continuum theory, balance of momenta, constitutive laws, elementary viscous flow, aerofoil theory, vortex motion, Navier-Stokes equations, very viscous flow, thin film flow, boundary layer theory.

Prerequisites: MS4404

MA4701 - TECHNOLOGICAL MATHEMATICS 1
ECTS Credits: 6

Mathematics & Statistics
Rationale and Purpose of the Module: To introduce students to the fundamental concepts of calculus and linear algebra.

To develop and integrate the basic mathematical skills relevant to technology.

Syllabus: Functions: graphs and functions, linear, quadratic and polynomial functions, exponential and logarithm, inverse function, limits and continuity; Trigonometry: basic ideas, definitions, formulae and identities, sine and cosine rules, applications, circular functions; The derivative and its applications: basic concept, rate of change, differentiation of sum product, quotient, chain rule, derivative of standard functions, simple applications, tangent and normal; Experimental Laws: curve-fitting, graphical techniques, expressions reducible to linear form, least-square approximation (formula only); Linear equations: solution of systems of linear equations by Gaussian elimination, examples with a unique solution, an infinite number or no solutions; Vectors: definition, addition, components, resultant, position vector, scalar product, dot product and angle between vectors. Complex Numbers: necessity, examples, definition, properties, equality, conjugate, modulus, geometric representations, Argand diagram, polar form: argument, exponential form, de Moivre's theorem, powers and roots.

MA6011 - CRYPTOGRAPHIC MATHEMATICS
ECTS Credits: 6

Mathematics & Statistics
Rationale and Purpose of the Module: To introduce the concepts of Number Theory that underpin cryptographic algorithm techniques and cryptanalysis and to develop skill in deductive reasoning. At the conclusion of the module a student should have the knowledge to handle the mathematics involved in public key cryptography and in the analysis of conventional key ciphers.

MB4001 - ALGEBRA 1  
ECTS Credits: 6

School of Education

Rationale and Purpose of the Module: To promote understanding of the number systems and their properties. To develop an understanding of the fundamental concepts of Linear Algebra. To promote proficiency in selected techniques and applications.

Syllabus: Number: basic number concepts, laws, equations; Number systems: extensions from N to Z, Z to Q and Q to R, complex numbers C; Elementary number theory: Peano's axioms, mathematical induction, binomial coefficients, fundamental theorem of arithmetic; Equations: linear, quadratic, polynomial equations, solution by graphical and numerical methods; Matrices: matrix algebra, applications.

MB4005 - ANALYSIS  
ECTS Credits: 6

Mathematics & Statistics

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

Syllabus: &bull; Set theory: equivalence classes of sets, cardinal numbers, countability and uncountability, including the uncountability of R. &bull; Functions of a real variable: limits, continuity and differentiability from first principles. &bull; Multivariate functions: inverse function theorem, implicit function theorem. &bull; Complex functions: differentiability and Cauchy-Riemann equations. &bull; The completeness property: Bolzano-Weierstrass theorem, Cauchy sequences and completeness. &bull; Sequences and series of functions: pointwise and uniform convergence, term-by-term differentiation and integration. &bull; General topology: Euclidean n-space, metric spaces, connectedness, compactness, fixed point theorem, Hilbert spaces.

Prerequisites: MS4021, MS4022

MB4017 - GEOMETRY  
ECTS Credits: 6

School of Education

Rationale and Purpose of the Module: Recent changes to the Teaching Council requirements means that every teacher on entry to the profession of teaching must study at least 3 credits of Geometry, either Euclidean or non-Euclidean. At present, no such module is available in the University of Limerick and so it is critical that we provide this option for students so that they can complete their entire undergraduate, pre-service mathematics programme in-house. Geometry is a core part of mathematics education and provides the basis for an introduction to rigorous mathematical reasoning. The study of geometry allows for student improvement in the area of logic, deductive reasoning and problem solving - all of which are skills that will benefit students in a range of other mathematical strands. Geometry is unlike pure mathematics modules in the sense that it has a wide range of practical applications. It is used, for example, in art, engineering, sport, construction, architecture, to name but a few. The literal translation of the word Geometry ("Earth Measure") serves to further highlight its applicability and this module will seek to highlight the relevance of the subject to all students undertaking it. As such, this module will share with students key mathematical concepts that underpin a lot of objects they see and use on a daily basis. Finally, Geometry and Trigonometry now makes up one-fifth of the junior and senior cycle mathematics curricula which the majority of students who study this module will end up teaching. As such, it is critical that they are equipped with the skills needed to teach this topic for understanding. In order to do this they themselves need a solid grounding in the subject and need to understand the rationale behind the theorems and constructions that they will encounter in the mathematics classroom. This module seeks to provide them with this knowledge.

Syllabus: The syllabus will be broke up into 8 sections/chapter. These 8 sections are: Pythagoras Congruences and Similarity Circles and Angles Trigonometry Co-ordinates Vectors and Symmetry Spherical Trigonometry Non-Euclidean Geometry

Prerequisites: MS4131

MD2001 - REFLECTIVE PRACTICE PORTFOLIO  
ECTS Credits: 6

Humanities

ACADEMIC CONTENT IS NOT CURRENTLY AVAILABLE FOR THIS MODULE - UPDATES ARE IN PROGRESS

MD4001 - PRACTICUM 1A  
ECTS Credits: 6

Humanities

Rationale and Purpose of the Module: Development of students primary performance interest, whether instrumental, vocal or dance. Also the development of musicianship and body awareness skills.

Syllabus: This module is divided into two parts. The first is the development of the students performance practice will occur in the stylistic context most common to the performance practice of the student. However tutors will begin to encourage students to look to other styles and repertoires current within a primarily Irish context. This will take place in the context of one-on-one classes and develops from the progress in Practicum 1a and 2a.

The second part of these modules will be related to performance skills and again this element will be divided into two separate streams for musicians and dancers. Musicians will take Keyboard Skills and Aural Training which will include keyboard harmony (vamping, chordal analysis and application, both aural and written), aural skills (transcribing tunes and songs, awareness of traditional forms and styles, sight reading and sight singing). It is important to emphasise that the orientation of this stream of multi-skill development will be towards the needs and realities of traditional Irish music and musicians but with a wider context in mind. Dancers will take Movement Awareness. This will include practical dance workshops to introduce some of
the movement principles that inform other dance practices today. It will also include an introduction to techniques and practices designed to promote the release of tension in the body in order to facilitate greater ease of movement. It will also include an introduction to the use of visual imagery as a way to develop an understanding of the correct alignment in movement. Finally an introduction to supplementary practices used by dancers as part of their training eg. Yoga, Feldenkrais, Alexander technique and Pilates. Improvisation will be undertaken in practical workshops to introduce the concept of improvisation as a means of exploring movement possibilities and also expanding movement vocabulary. Improvisations will include working with movement themes, dramatic themes, props, text and visual stimuli.

MD4007 - PRACTICUM 6A - MAIN PERFORMANCE INTEREST
ECTS Credits: 6

Humanities

Rationale and Purpose of the Module: The development of a final extensive performance.

Syllabus: In this module students, with relevant tutors and under the direction of course director, will design and undertake an extensive, hour long recital which will be representative of both their own stylistic interest but also a range of diverse music and/or dance styles (in the case of dance, two to three smaller performances over a similar number of days will be considered).

MD4011 - PRACTICUM 1B
ECTS Credits: 6

Humanities

Rationale and Purpose of the Module: Development of the students primary performance interest, whether instrumental, vocal or dance. Students will be encouraged to engage in a dynamic self-critical process conducive to development and related to the principle of reflective practice. Also the development of musicianship and body-awareness skills.

Syllabus: This module is divided into two parts. The first is the development of the students performance practice and will occur in the stylistic context most common to the performance practice of the student. However, tutors will begin to encourage students to look to other styles and repertoires current within a primarily Irish context. This will take place in the context of one-on-one classes and develops from the progress in Practicum 1a.

The second part of these modules will be related to performance skills and again this element will be divided into two separate streams for musicians and dancers. Musicians will take Keyboard Skills and Aural Training which will include keyboard harmony (vamping, chordal analysis and application, both aural and written), aural skills (transcribing tunes and songs, awareness of traditional forms and styles, sight reading and sight singing). It is important to emphasise that the orientation of this stream of multi-skilled development will be towards the needs and realities of traditional Irish music and musicians but with a wider context in mind. Dancers will take Movement Awareness. This will include practical dance workshops to introduce some of the movement principles that inform other dance practices today. It will also include an introduction to techniques and practices designed to promote the release of tension in the body in order to facilitate greater ease of movement. It will also include an introduction to the use of visual imagery as a way to develop an understanding of the correct alignment in movement. Finally an introduction to supplementary practices used by dancers as part of their training eg. Yoga, Feldenkrais, Alexander technique and Pilates. Improvisation will be undertaken in practical workshops to introduce the concept of improvisation as a means of exploring movement possibilities and also expanding movement vocabulary. Improvisations will include working with movement themes, dramatic themes, props, text and visual stimuli.

MD4017 - PRACTICUM 6B
ECTS Credits: 6

Humanities

Rationale and Purpose of the Module: The development of final extensive performance representative of performance fields studied but not central to the students performance practice.

Syllabus: In this module students, with relevant tutors and under the direction of course directors, will prepare and undertake a performance representative of the three areas of performance skills represented in the second performance stream â€” those not central to their performance practice. This performance will be at the end of the linked module in the next semester.

Assessment will be on that final performance and continuous assessment.

MD4027 - IRISH TRADITIONAL MUSIC AND DANCE STUDIES 4
ECTS Credits: 6

Humanities

Rationale and Purpose of the Module: The development of a research project in the field of traditional music and/or dance studies.

Syllabus: In this module students will engage in a self-directed research project concerning an aspect of the music or dance tradition under the supervision of course directors. This will be assessed through two seminar presentations and an extensive written submission. This research project could have a performance orientation.

MD4047 - PERFORMANCE STUDIES 5: INTERCULTURALISM AND PERFORMANCE / FYP
ECTS Credits: 6

Humanities

Rationale and Purpose of the Module: To introduce students to the discourse of global and intercultural performance including current research perspectives, ethical issues and performance practice as political engagement.

MD4051 - SOMATICS AND RITUAL PERFORMANCE 1  
ECTS Credits: 6

Humanities

Rationale and Purpose of the Module: This module will provide each student with the opportunity to develop skills to research and develop an informed and intelligent approach to their own specific technical needs so they can develop healthy and sustainable practices in preparation for performance. It will also encourage them to develop skills to explore new models for ritualizing performance, which will increase their options for engagement in a range of professional practices.

Syllabus: An introduction to the history of contemporary somatic practices and their various application in arts practice with particular reference to performance, educational, and therapeutic contexts, with particular reference to the somatic practice of Body Mind Centering, in addition students will study historical, cultural and social aspects of ritual practice with specific reference to performance rituals.

MD4057 - SOMATICS AND RITUAL PERFORMANCE 5  
ECTS Credits: 6

Humanities

Rationale and Purpose of the Module: This module will provide each student with the opportunity to continue to develop skills to research and develop an informed and intelligent approach to their own specific technical needs so they can develop healthy and sustainable practices in preparation for performance; it will also provide the opportunity to develop skills and confidence to create innovative new models for ritualising performance; students will specialise in creating a project within a specific context and begin to focus on their preferred options for professional practice.

Syllabus: This module will provide each student with the opportunity to continue the study and practice of Authentic Movement, Feldenkrais and Alexander techniques to develop skills to research and develop an informed and intelligent approach to their own specific technical needs and also so they can develop healthy and sustainable practices in preparation for professional practice; students will specialise in creating a project within a specific context and begin to focus on their preferred options for professional practice.

MD4061 - VOICE AND DANCE SKILLS FOR PERFORMANCE 1  
ECTS Credits: 6

Humanities

Rationale and Purpose of the Module: To provide the opportunity for students to study a broad range of movement and voice techniques in order to develop good understanding and foundation for their practice. The development of a broad base of performance skills will empower the students in professional performance based contexts.

Syllabus: Students will be required to specialise in voice or dance, and will study and practice a range of different techniques and methods designed to provide them with a strong foundation on which to develop their technical ability in both dance and voice focussing on contemporary dance and voice technique training and including dance techniques and practices from Irish, Asian and African traditions, as well as ear training, sight reading/singing and oral transmission learning to complement the technique of voice production.

MD4067 - VOICE AND DANCE SKILLS FOR PERFORMANCE 5  
ECTS Credits: 6

Humanities

Rationale and Purpose of the Module: To provide the opportunity for students to study a broad range of movement and voice techniques in order to develop good understanding and foundation for their practice. The development of a broad base of performance skills will empower the students in professional performance based contexts.

Syllabus: Students will be required to specialise in voice or dance, and will study and practice a range of different techniques and methods designed to provide them with a strong foundation on which to develop their technical ability in both dance and voice focussing on contemporary dance and voice technique training and including dance techniques and practices from Irish, Asian and African traditions, as well as ear training, sight reading/singing and oral transmission learning to complement the technique of voice production.

MD4071 - REPERTOIRE, IMPROVISATION AND COMPOSITION 1  
ECTS Credits: 6

Humanities

Rationale and Purpose of the Module: To develop the understanding in both practice and theory of the works from the canon of western contemporary and world dance and song traditions in order to fully understand their relevance in current performance contexts. To develop skills necessary to prepare to perform these dances and songs in range of performance contexts.

Syllabus: Students will be required to specialise in voice or dance, and will study and practice dances and songs from the repertoire of western contemporary and Asian, African and Irish dance; and Gregorian chant, Irish traditional song, western solo and choral, and jazz and pop music traditions; in addition they will study the historical and cultural contexts within which these repertoires developed, and study and practice skills necessary to develop in both solo work and as a member of an ensemble.

MD4077 - REPERTOIRE, IMPROVISATION AND COMPOSITION 5  
ECTS Credits: 6

Humanities

Rationale and Purpose of the Module: To support students to develop the understanding of the artistic and technical requirements necessary to develop and produce performances in a range of contexts and broaden their understanding of how to produce work as creative artists and performers in professional performances projects.

Syllabus: Students will be required to specialise in voice or dance, and will work under the direction of guest tutors and the course directors to design and produce a number of performance projects to be presented in a range of performance contexts, featuring the students own work in addition to the works from the repertories they have studied; the performances will include solo and ensemble works.
MD4081 - Irish Music and Dance Studies
ECTS Credits: 6

Humanities

Rationale and Purpose of the Module: The purpose of this module is to more deeply engage issues in Irish traditional music and dance studies and, in this context, to apply cultural theory to Irish music and dance Studies in a deeper and more creative way. These issues will be in the interactive contexts of Irish traditional music, song and dance, interrogating themes of difference and identity as relevant to traditional musicians in the past and present.

Syllabus: Specific issues will be focused on in the areas of Irish and English Language Song; the multitude of Irish dance styles as well as instrumental practice. These are to be addressed using a thematic approach which will engage theoretical areas such as identity, ethnicity, globalisation and the meaning of tradition. As such this is a research led module and themes and approaches will be developed by the course leader in association with fellow faculty.

MD4078 - ADVANCED ENSEMBLE
ECTS Credits: 6

Humanities

Rationale and Purpose of the Module: This is a module for fourth year BA Irish Music and Dance Students who wish to develop their ensemble skills further and who show a propensity to do so in their assessment for module MD4016.

Syllabus: Students in this module will concentrate on developing their knowledge of ensemble skills taken from a number of musical contexts. These skills will be developed in the context of their own performance practices. Students will attend a number of lectures that engage a systematic examination of the musical processes involved in the creation of ensemble. Such processes will then be utilised in performance laboratory classes, which will result in a public performance, developed in the context of a reflective journal.

MD4091 - Irish World Academy Practicum C1
ECTS Credits: 6

Humanities

Rationale and Purpose of the Module: This module focuses on students developing their artistic practice in an collaborative context while gaining embodied experience of other arts practices outside of their own genre and disciplinary specialities. The rationale for including a defined space for the engagement with performance practices unfamiliar to the student is to show the student different creativities structured by unfamiliar aesthetics, cultural context and modes of embodiment. The title of the module reflects the Irish World Academy tradition of presenting modules with an wide performance skills focus as 'practicum'. Such an approach is enabled by an embodied methodology that is critically engaged. The 'C' of the title is a reflection of the cross-genre content of the module.

Syllabus: This module is split into two parts. In the first the student will engage other students in a laboratory space within their own discipline, mentored by faculty and tutors, to develop creative, collaborative work within and extending from their own disciplines and genre practices. The second half of this module is designed to facilitate 'cross-arts' exploration of creative practice as a core dimension of every Academy undergraduate's educational experience. Each student will chose a performance course, from a genre or approach outside of their disciplinary and genre focused stream, selecting from a pool of courses covering instrumental / dance tuition, music/dance ensemble, dance/music ensemble, dance/music composition and other available performing arts practices. Students will have the option to build on cross-genre skills acquired in Practicum C1 and/or C2 in certain contexts.

MD4097 - COMPOSITION AND ARRANGEMENT IN IRISH TRADITIONAL MUSIC 1
ECTS Credits: 6

Humanities

Rationale and Purpose of the Module: To develop the students' skills and knowledge of composition and arrangement in the idiom of Irish traditional music as it is performed contemporarily.

Syllabus: Students will examine the various ensemble practices in Irish traditional music in currency today. These practices will include 'traditional as well as more contemporary and fusion based styles of composition and arrangement. This examination will engage ethnomusicological issues of origin and creation as well as practices of record, transcription and reproduction. Students will also develop and synthesize their own arrangement and composition practices from those studied. Students will be provided with written feedback according to BA Irish Music and Dance policy.
MD4101 - PERFORMANCE 1A
ECTS Credits: 6

Humanities

Rationale and Purpose of the Module: Development of the student's primary performance interest, whether instrumental, vocal or dance. Students will be encouraged to engage in a dynamic self-critical process conducive to development and related to the principle of 'reflective practice'. Also the development of musicianship and body-awareness skills.

Syllabus: This module is divided into two parts. The first is the development of the students' performance practice and will occur in the stylistic context most common to the performance practice of the student. The second part of this module will be related to performance skills pertinent to the specific music, song or dance practices of the student.

MD4103 - PERFORMANCE 3A
ECTS Credits: 6

Humanities

Rationale and Purpose of the Module: Further development of the student’s primary performance interest, whether instrumental, vocal or dance. Students will be encouraged to engage in a dynamic self-critical process conducive to development and related to the principle of ‘reflective practice’. Also the development of musicianship and body-awareness skills.

Syllabus: This module is a development of the semester first year Performance 1A and 2A modules and as such divided into two parts. The first is the development of the student’s performance practice and will occur in the stylistic context most common to the performance practice of the student. The second part of this module will be related to performance skills pertinent to the specific music, song or dance practices of the student.

MD4104 - MUSIC THEORY AND PRACTICE SKILLS 1
ECTS Credits: 6

Humanities

Rationale and Purpose of the Module: This is an elective module intended for undergraduate students with dance as a first area who wish to have more instruction in music theory, ear and notation practice and keyboard skills in order to further develop skills introduced to the student from first semester of first year, increasing his/her employability as a music teacher.

Syllabus: Piano skills including sight-reading, accompaniment technique, basic arrangements, right hand ornamentation; music theory and practice, including dictation (melodic, rhythmic and harmonic) understanding modes and scales and their operations in Western harmony and in Irish contexts; tune composition; basic modulation and chordal accompaniment; music analysis.

Prerequisites: MD4001, MD4002, MD4003

MD4113 - PERFORMING ARTS TECHNOLOGY
ECTS Credits: 6

Humanities

Rationale and Purpose of the Module: This module will introduce students to professional audio and visual technologies relevant to performers in their field. The professional world around performance practice, performance education, media and other career paths open to students on this programme will be explored. Students will use such technologies in professional contexts generating project work out of the day-to-day life of the Academy, recording concerts, providing technical support to a wide range of performances and generating media appropriate to the world of performing arts.

Syllabus: Students in this module will learn practical technological applications relevant to their performance practice. Students will learn to use and manipulate PAs and lighting rigs, led by professionals in the field and applied in real-world situations. Students will also be introduced to media generating software such as Final-Cut Pro and Logic to produce high level audio and video outputs.

MD4117 - PROFESSIONAL SKILLS / FINAL YEAR VOCATIONAL PROJECT
ECTS Credits: 6

Humanities

ACADEMIC CONTENT IS NOT CURRENTLY AVAILABLE FOR THIS MODULE - UPDATES ARE IN PROGRESS

MD4121 - INTRODUCTION TO VERTICAL DANCE AND WALL RUNNING
ECTS Credits: 6

Humanities

Rationale and Purpose of the Module: The aim of this module is to introduce students to this core aspect of aerial dance. This module forms part of a suite of aerial modules designed to create an aerial dance strand within the MA Festive Arts programme. This responds to the demand for third level training in the field, combined with the management and research elements of the MA Festive Arts programme. The class combines the use of sit-harness and abseil equipment both against a wall and free-flying. The class begins with basic kit familiarisation and core stability, strengthening and preparation. It then progresses to basic orientation on different planes, building towards a more dynamic vocabulary. Students will also be taught repertoire from established company performances, as well as allowing student time for creative input.

Syllabus: The class combines the use of sit-harness and abseil equipment both against a wall and free-flying. The class begins with basic kit familiarisation and core stability, strengthening and preparation. It then progresses to basic orientation on different planes, building towards a more dynamic vocabulary. Students will also be taught repertoire from established company performances, as well as allowing student time for creative input.
MD4123 - DANCE STUDIES 1  
ECTS Credits: 6

Humanities

Rationale and Purpose of the Module: This module will introduce students to the history of modern dance, from its roots in the classical forms of the eighteenth and nineteenth centuries as well as popular forms of the twentieth. Students will be encouraged to see such development in a wider aesthetic, social and cultural context. Embracing the principles of arts practice, students will be given the opportunity to engage contemporary approaches to modern dance.

Syllabus: This module aims to develop knowledge of social and historical influences in the development of modern dance over the past 300 years and to develop understanding of anatomy in relation to the dancing body. The module also aims to raise awareness of the social construction of dance knowledge, dance practices and their historical contexts and a critical approach to source material. The main focus of the course will be on Romanticism, Classicism, Neo-Classicism, Modernism, Post-Modernism and the twentieth century history of Irish theatre dance. The module will develop students' independent research, library research/source location skills and critical thinking.

MD4131 - HIP-HOP-DANCE ELECTIVE 1  
ECTS Credits: 6

Humanities

Rationale and Purpose of the Module: To provide students with the opportunity to become competent in hip hop dance so that they can develop the skills and confidence to work towards the creation of Hip-Hop compositions in a range of performance contexts, which will broaden their career options in Dance.

Syllabus: Over this elective, students will learn, in studio, the roots of Hip-Hop and its evolution from the streets of New York city in the 1970s. Emphasis will be placed on learning about roots of Hip-Hop through class participation and learning the choreography of these dances and origins. By utilizing contemporary choreographic techniques, dancers will create new works for performance.

MD4141 - IRISH DANCE PERFORMANCE SKILLS  
ECTS Credits: 6

Humanities

Rationale and Purpose of the Module: This elective will be offered to musicians and dancers whose performance practice is outside of the Irish dance tradition. It will add to their performance skill set and increase their versatility and dance competence. It also reflects the strengths of Academy faculty.

Syllabus: Development of good basics in Irish dance technique. Students will continue to develop basic Irish dance steps and movement patterns. Music/dance connection will also be explored. The following tune types will be among those used to teach Irish dance rhythm: Reel, jig, hornpipe, waltz and polka. Posture, turnout and footwork will be emphasised to give students a basic dance vocabulary which they can draw on. They will learn motifs suitable for soft shoe and more rhythmic hard shoe dancing.

MD4207 - HIGH LONESOME: SOUNDS AND NARRATIVES OF COUNTRY MUSIC  
ECTS Credits: 6

Humanities

Rationale and Purpose of the Module: This is an elective module for second, third or fourth year BA Irish Music and Dance Students interested in issues of ethnicity and identity as imagined, expressed, and performed through the genre of Country music in Ireland and in the US. Understanding this genre as a vernacular tradition in its particular regional/national contexts will shed light on what is at stake for those who perform and consume country music.

Syllabus: Students will look at the phenomenon of country music, placing particular emphasis on connections between Ireland and America as manifest in the sounds and narratives of this genre. The course will involve gaining a greater understanding of the vernacular tradition(s) of country music (i.e. country music in Ireland), as well as more generally concerned with definitions of the genre and how and where these definitions hold up or break down under scrutiny. Focusing on `narratives of country music will involve looking at song themes and topics (such as loss and desire, myth of the West, the open road, etc), as well as inviting a greater understanding of the genre itself and the kinds of musical/historical/political/cultural pathways it has and continues to follows (spiritual dimension, ethnic profile, national characteristics, gender roles, song construction). Ultimately, students will concern themselves with the questions of how identity is imagined, constructed, maintained, and negotiated though sound, sentiment, and narrative song performance and its subsequent reception in historical and current contexts.

MD5501 - IRISH WORLD ACADEMY OF MUSIC AND DANCE AUTUMN ELECTIVE  
ECTS Credits: 6

Humanities

Rationale and Purpose of the Module: - To initiate self-directed study as a means of  
(1) deepening ones knowledge / expertise within a primary specialisation  
(2) developing skills and knowledge in a secondary area of specialisation  
(3) engaging in creative, cross-platform study / performance through a combination of a variety of areas.  
- To allow a variety of project presentation and negotiable assessment weighting, encouraging the student to propose a form of presentation most suitable to the project and the educational journey, as well as a form of assessment capable of accurately evaluating the outcomes.

Syllabus: This module offers students the opportunity to pursue self-directed learning of an academic or performance-based project, under the guidance of the course director and an elective supervisor. The student may wish to use the elective to pursue more specialised study in his / her area of study, or to access the other areas of expertise available at the centre. These currently include Ethnomusicology, Ethnochoreology, Music Education, Community Music, Music Therapy, Irish Traditional Music and Dance Performance, Contemporary Dance Performance and other specialist research interests of faculty and doctoral researchers at the Academy.
Rationale and Purpose of the Module: To provide an introduction into current media technologies as they are used in the fields of performing arts, creative arts therapies, and arts research; to develop essential skills and fluency in these technologies in order to use them competently, creatively, and effectively in one's own specific discipline.

Syllabus: Students will be introduced to the current media technologies in audio, video and stagecraft/soundcraft/lightcraft as pertinent to the programmes offering the course. Students will study and practise essential skills required to employ technology to create an audio/video project related to their field of study, using stagecraft/soundcraft/lightcraft where applicable.

ECTS Credits: 3

MD6031 - MEDIA TECHNOLOGIES FOR PERFORMING ARTS & ARTS RESEARCH

ECTS Credits: 3

MD6041 - INTRODUCTION TO RITUAL STUDIES

ECTS Credits: 3

Humanities

Rationale and Purpose of the Module: The purpose of this module is to equip students with a knowledge of the emergence and development of ritual studies as an interdisciplinary discourse drawing on anthropology, sociology, religious studies, ethnomusicology /ethnochoreology and performance studies. It also familiarises students with a variety of theoretical approaches to ritual including evolutionary, structural-functionalist, cultural-symbolist and performative understandings. This is grounded with reference to several case studies of ritual practice drawn from historical and cross-cultural practices.

Syllabus: This module provides an introduction to the emergence and development of ritual studies as an interdisciplinary discourse drawing on anthropology, sociology, religious studies, ethnomusicology /ethnochoreology and performance studies. It introduces studies to evolutionary, structural-functionalist, cultural-symbolist and performative theories of ritual. It also discusses a number of ritual case studies including historical and cross-cultural examples of ritual practice. The documentation of live rituals through ethnographic approaches including participant-observation will also be introduced.

MD6051 - INDEPENDENT STUDY 1

ECTS Credits: 3

Humanities

Rationale and Purpose of the Module: To initiate self-directed study as a means of (1) deepening knowledge / expertise within a primary specialisation (2) developing skills and knowledge in a secondary area of specialisation (3) engaging in creative, cross-platform study / performance through a combination of a variety of areas.

- To allow a variety of project presentation and negotiable assessment weighting, encouraging the student to propose a form of presentation most suitable to the project and the educational journey, as well as a form of assessment capable of accurately evaluating the outcomes.

Syllabus: This module offers students the opportunity to pursue self-directed learning of an academic or performance-based project, under the guidance of the course director and supervisor. The student may wish to use the module to pursue more specialised study in his/ her area of study, or to access the other areas of expertise available at the centre. These currently include Ethnomusicology, Ethnochoreology, Music Education, Community Music, Music Therapy, Irish Traditional Music and Dance Performance, Classical String Performance, Contemporary Dance Performance, Ritual Chant and Song, Festive Arts, and other specialist research interests of faculty and doctoral researchers at the Irish World Academy.

ECTS Credits: 3

MD6061 - INTRODUCTION TO SOMATICS

ECTS Credits: 3

Humanities

Rationale and Purpose of the Module: This module will ensure that students are educated in somatics practices that promote a healthy and mindful approach to movement. The continued development of an integrated mind/body approach will enable students to perform with greater efficiency and will minimize their risk of injury.

Syllabus: Students will attend workshops during which they will study how somatic practices can support them in developing an enhanced awareness of embodied movement. These workshops will be based on principles drawn from: Pilates, Yoga, Feldenkrais, Body-Mind Centering and T’ai Chi

ECTS Credits: 3

MD6071 - WRITING AND THE DOCUMENTATION OF ARTS PRACTICE 1

ECTS Credits: 3

Humanities

Rationale and Purpose of the Module: The purpose of this module is to explore a variety of approaches to the documentation of artistic practices, with a focus on documentation through writing.

Syllabus: Students will explore a variety of approaches to the documentation of artistic practices, with a focus on documentation through writing. These include forms of documentation emerging from personal memory data, self observation and reflection, as well as the collection of data from external sources including mentors and artistic colleagues. Registers of writing including the poetic, narrative, chronological and critical will be investigated. The role and function of writing in the creative process will be interrogated through creative and critical engagement. Methodological frameworks for the documentation of practice including autoethnography and narrative inquiry will be introduced.

ECTS Credits: 3

MD6081 - CRITICAL ENGAGEMENTS WITH IRISH TRADITIONAL MUSIC

ECTS Credits: 3

Humanities

Rationale and Purpose of the Module: To examine manuscript, printed, audio and visual sources of Irish traditional music. Students will engage trends in current research in the field of traditional music studies.

Syllabus: In this module students will examine writings on and sources of Irish traditional music to enhance their understanding of this tradition. They will critically engage with texts relevant to Irish traditional music studies and related fields.
MD6091 - PROFESSIONAL DEVELOPMENT FOR THE PERFORMING ARTS
ECTS Credits: 3

Humanities

Rationale and Purpose of the Module: This module is designed to provide an awareness of professional development skills and contexts central to developing a career in the arts. It introduces students to several key facets of planning, arts project management, and career development as part of their professional development.

Syllabus: This module provides students with an introduction to core skills and concepts relevant to the development of performing arts careers in the contemporary world. Key issues covered include project development, planning, communications and pitching, as well as collaborative work, legal structures for working individually or in groups, and fundraising.

MD6101 - INTERDISCIPLINARY IMPROVISATION
ECTS Credits: 3

Humanities

Rationale and Purpose of the Module: To provide an overview of improvisational processes within the context of current dance and music practices. To introduce the students to a range of aesthetic and technical approaches to improvisation. To provide for students to research improvisational processes and to integrate and apply this knowledge in their own practice.

Syllabus: Students will attend a number of workshops in which music and dance faculty will demonstrate and apply improvisational processes and practices. Students will develop improvisational scores based on the materials presented.

MD6111 - COLLOQUIUM 1
ECTS Credits: 3

Humanities

Rationale and Purpose of the Module: The purpose of this module is to encourage and facilitate postgraduate students to engage with a community of scholars and practitioners presenting their respective work, from a variety of disciplinary and performance practice perspectives, in a formal, large-scale and medium-scale colloquium/seminar context, drawing from in-house seminars including the Tower Seminar Series, Logos, and other seminars. Students will expand their knowledge from within and outside of their own specialisations, and will tacitly learn about presenting their own work in such a format.

Syllabus: This module will expose students to scholarship and performance practices from a wide variety of music and dance and related disciplines, enabling students to broaden their perspectives on their own specialisation as well as experience presentations from scholars and performers in cognate disciplines. Students will be expected to attend five seminars from the various series offered in the Academy (Tower Seminar series and/or comparable events, as approved by participating programme coordinators). As a consequence, engage in self directed inquiry and independent study where they have come across a topic or research/performance approach that stimulates their own research practice.

MD6121 - FESTIVAL DEVELOPMENT AND PRODUCTION
ECTS Credits: 3

Humanities

Rationale and Purpose of the Module: To provide students with a foundation in the issues surrounding festival production and sustainable development.

Syllabus: This module provides students with a foundation in the issues surrounding festival development and sustainability, covering a range of topics including events production, audience development, feasibility, public relations, media relations, fundraising, stakeholder and partnership development, security, local authorities, and health and safety.

Prerequisites: MU5081

MD6131 - INTRODUCTION TO LOCAL AND GLOBAL FESTIVITY
ECTS Credits: 6

Humanities

Rationale and Purpose of the Module: To introduce students to methods for studying public, religious, domestic and civic festivity, with a particular emphasis on the social roles of festival and the performative dimension of festivity.

Syllabus: This module introduces students to appropriate methods for studying public, religious, domestic and civic festivity with a particular emphasis on the social role of festival and the performative aspects of festive activities. It critically engages with different methods of gathering data and narratives on festival, as well as with core ideas such as the definition of value, of identity and of public space.

Prerequisites: MU5081

MD6141 - RESEARCH AND DISCOVERY FOR FESTIVAL STUDIES
ECTS Credits: 6

Humanities

Rationale and Purpose of the Module: To provide students with a contextual, cross-cultural understanding of festival, based on case studies of specific local, national and international festivals.

Syllabus: The aim of this module is to introduce students to key perspectives in the study of festivity and its dynamics in society, through an exploration of festival and festivity in different historical and geographical contexts. Through the exploration of case studies and key contextual readings, students develop conceptual, theoretical and methodological frameworks for the study and understanding of festivity in society.

Prerequisites: MU5091

MD6151 - MATERIALS, METHODS & CONTEXT FOR WESTERN CHANT 1
ECTS Credits: 6

Humanities

Rationale and Purpose of the Module: To facilitate an understanding of methodologies and theoretical paradigms relevant to the study and performance of Western plainchant, drawing on both historical musicological and ethnomusicological approaches. To
introduce Western plainchant from its beginnings until the later Middle Ages, exploring it in its historical, social, religious, liturgical, intellectual and aesthetic contexts. This will include an investigation of its origins and evolution; nature, materials, forms and styles in relation to function, date and place; written sources and their palaeography; notation (general concepts and features; notations of particular regions and periods; principles and techniques of transcription and editing).

**Syllabus:** This module lays the basis for important research and methodologies that relate to the performance practice of Western plainchant. It will introduce students to fundamental research tools in primary and secondary sources, bibliographic and referencing techniques, historical contextual knowledge, musical palaeography and semiotics. The methodological approach is presented as an interdisciplinary pursuit combining historical musicology, ethnomusicology, semiotics and relevant critical theory.

---

**MD6161 - IRISH TRADITIONAL MUSIC PERFORMANCE RESEARCH SEMINAR**

**ECTS Credits:** 3

**Humanities**

**Rationale and Purpose of the Module:** This module will introduce students to current research in the area of traditional music studies. This research will be engaged through the critical assessment of current publications in the field, examining developments in the epistemology and phenomenology of current critical academic engagement with this historical artistic practice. The module will particularly examine the impact, real and potential, of these developments on the performance practice.

**Syllabus:** In this module students will study the history, theory and practice of Irish traditional music. They will be encouraged to use theoretical tools from a number of disciplines to enhance their understanding of this practice. They will examine publications and resources that examine Irish traditional music in an exemplary and innovative fashion.

---

**MD6171 - FRAMING IRISH MUSIC: SOURCES AND DISCOURSES 1**

**ECTS Credits:** 9

This module will particularly examine the impact, real and potential, of these developments on the performance practice. The module examines how these acts as important identity markers for communities of practice, and how songwriters negotiate the representation and dissemination of image and songs as commercially mediated products or commodities.

---

**MD6181 - SONGWRITING STYLE AND CONTEXT 1**

**ECTS Credits:** 3

**Humanities**

**Rationale and Purpose of the Module:** In this module students explore songwriting, songwriters and repertoires and the creation of meaning and the construction of identity through songwriting and performance. Students consider various cultural, economic, social, political and historical contexts, focusing particularly on issues of genre.

**Syllabus:** The many processes involved in songwriting are examined across a range of genres, cultures and epochs, engaging with exemplary songwriters, repertoires and practices, within their cultural, economic, social, political and historical contexts. Students engage with the multiple ways in which song style and performance practice develop in response to shifting social, economic, political and artistic conditions.

---

**MD6191 - SONGWRITING PROCESS 1**

**ECTS Credits:** 12

**Humanities**

**Rationale and Purpose of the Module:** In this module students explore the creative process of songwriting and develop the skills to produce a body of work for performance and/or recording in a supportive, reflective environment. With the guidance of the course director and songwriting faculty, students hone skills and strategies in writing song lyrics, composing song melodies and creating song arrangements. Students also develop skills in reflective practice/critique.

**Syllabus:** This module provides students with opportunities to engage with a variety of approaches to songwriting, helping them to better understand and locate their own artistic practice. Students develop their skills in lyric writing and in music arrangement and composition. Students develop a body of work for recording and/or performance through a combination of one-on-one mentoring with their creative mentor, performance-based seminars with visiting artists and collaborative workshops with their peers.

---

**MD6201 - INSTRUMENTAL SKILLS FOR SONGWRITERS**

**ECTS Credits:** 3

**Humanities**

**Rationale and Purpose of the Module:** This module develops the instrumental skills of the songwriter appropriate to their songwriting and performance practices.

**Syllabus:** Songwriters develop instrumental skills that enhance the creative process of songwriting, improve their ability to accompany themselves or other performers in the performance of their songs, and develop their ability to demonstrate their creative ideas with a musical instrument.
MD6211 - IRISH WORLD ACADEMY ENSEMBLES  
ECTS Credits: 3  

**Humanities**

**Rationale and Purpose of the Module:** This module provides students with the opportunity to rehearse and perform with one of the Irish World Academy's existing performing ensembles. Through participation in collaborative music making with members of the wider community of musicians at the Irish World Academy, songwriting students broaden their own practice as musicians and their perspectives as writers and performers. Students develop cross-cultural understanding of diverse music repertoires, greater confidence as performers, and build musical relationships through their membership of their chosen ensemble.

**Syllabus:** Students choose to participate in one ensemble from the Academy's diverse range of music ensembles. Ensemble options include (but are not limited to):
- Vocal Ensemble
- Gospel Choir
- Chant Ensemble
- Irish World Academy Choir
- Gamelan Orchestra

Students learn ensemble-specific repertoire and performance practices through attendance at weekly rehearsals and participation in ensemble performances.

---

**MD6221 - APPLIED MUSIC THEORY FOR SONGWRITERS**  
ECTS Credits: 3  

**Humanities**

**Rationale and Purpose of the Module:** In this module, students develop applied music theory skills appropriate to the practice of songwriting. Students build competencies and vocabulary in music literacy, harmony and other relevant aspects of music theory. Students also develop skills in sight-singing, keyboard practice and other instrument-specific practices. This module is elective for students of MA Songwriting and open to other IWAMD MA students with a particular interest in songwriting.

**Syllabus:** Students develop their knowledge of theoretical aspects of music and learn to apply this knowledge in their own song composition and performance practices. Students analyse important stylistic aspects of musical language and grammar, including form, melody, rhythm, harmony, chords, part-writing and ensemble textures. Students improve their music literacy by developing listening skills and their ability to sight-sing and sight-read at the keyboard and on their own instrument.

---

**MD8001 - ARTS PRACTICE RESEARCH 1**  
ECTS Credits: 6  

**Humanities**

**Rationale and Purpose of the Module:** The aim of this module is to introduce students to a variety of theoretical perspectives on arts practice research, towards the development of a framework suited to the specialist needs of individual research questions.

**Syllabus:** This module is geared primarily towards the theorising of research problems in an area of study in which practice cannot be easily distinguished from theory. The course is designed as an active meditation of the paradoxes inherent in theorising performance in which students draw on their lived-experience as artists to make the texts meaningful. Through historical readings, students will become familiar with the traces left by scholar-performers in the past who have written on this relation. Keywords and concepts will be addressed such as aesthetics, agency, embodiment, everyday life, festival, gender, heritage, identity, liveness, narrative, performance art, performativity, play, poetics, race, representation/mimesis, ritual, spectatorship. Topics proposed for this seminar by current faculty include: the broad spectrum approach to performance, music and dance as social life, the intersection between performance and ritual, concepts and issues in music/dance practice from ethnochoreological and ethnomusicalological perspectives, the artist in a globalised world i.e. the relationships among local arts/global lives and global arts/local lives, what are the implications, for arts practice research, of the privileged status of writing in theory production in the academy, examining the concept of disciplinary-mastery in arts practice.

---

**MD8013 - IWA SPECIALIST ELECTIVE 3**  
ECTS Credits: 12  

**Humanities**

**Rationale and Purpose of the Module:** The aim of this module is to facilitate the development of specialist skills, relevant to the research project, through the design of a self-direction programme of study which may integrate performance, composition, choreography, academic writing and collaborative work.

**Syllabus:** This module comprises a programme of self-directed learning which is created to facilitate the development of the research programme. It is design by
the student in consultation with his/her supervisor and supervisory panel and may include performance, composition, choreography, academic writing and collaborative work.

MD8021 - IWA SPECIALIST ELECTIVE 1
ECTS Credits: 12

Humanities

Rationale and Purpose of the Module: The aim of this module is to facilitate the development of specialist skills, relevant to the research project, through the design of a self-direction programme of study which may integrate performance, composition, choreography, academic writing and collaborative work.

Syllabus: This module comprises a programme of self-directed learning which is created to facilitate the development of the research programme. It is design by the student in consultation with his/her supervisor and supervisory panel and may include performance, composition, choreography, academic writing and collaborative work.

ME4037 - ADVANCED MECHANICS OF SOLIDS
ECTS Credits: 6

School of Engineering

Rationale and Purpose of the Module: To analyse stresses and strains in 2D and 3D in an elastic body subjected to various loading conditions. To analyse stresses and strains in uniaxial, biaxial and axisymmetric stress fields for elastomers. To understand how to apply stress functions to problems in bending, contact stress and pure shear. To use numerical techniques combined with experimental analysis for the solution of complex problems.


ME4057 - AEROSPACE METALLIC MATERIALS
ECTS Credits: 6

School of Engineering

ACADEMIC CONTENT IS NOT CURRENTLY AVAILABLE FOR THIS MODULE - UPDATES ARE IN PROGRESS

ME4111 - ENGINEERING MECHANICS 1
ECTS Credits: 6

School of Engineering

Rationale and Purpose of the Module: To introduce the profession of engineering, develop non-technical skills such as report writing, encourage a spirit of research and self-study, develop students knowledge of the use of engineering units.

Syllabus: Overview of the engineering disciplines currently being offered by the Mechanical and Aeronautical Engineering department: The profession (Mechanical, Aeronautical, Biomedical, Design), real-life engineering examples, skills required, career opportunities and career progression. Materials used in engineering products, alloys of iron, steel and aluminium, ceramics, polymers, composites; materials specific to biomedical and aeronautical applications.

ME4112 - ENGINEERING MECHANICS 2
ECTS Credits: 6

School of 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

ME4128 - AIRCRAFT FLIGHT DYNAMICS AND
School of Engineering

Rationale and Purpose of the Module: To provide the theoretical knowledge required to predict an aircraft’s flight dynamical behaviour, given the vehicle geometry, configuration, and flight conditions.

Syllabus:
- Uniaxial stress and biaxial strain fields.
- Constitutive relations.
- Shear force and bending moment diagrams.
- Bending of beams, Transverse shear stress in beams, Composite beams, Thermal stress, Torsion of cylindrical sections, Analysis of stress at a point in 2D, Principal stress and Mohr’s stress circle, Thin cylinders and thin spherical vessels.

ME4227 - AIRCRAFT STRUCTURES
ECTS Credits: 6

School of Engineering

Rationale and Purpose of the Module: Module builds on the Mechanics of Solids 2 module by providing further skills in the analysis of stress, strain and deformation of aircraft structures.

Syllabus:
- Theory of elasticity; Airy stress function.
- Energy methods for structural analysis.
- Shear and torsion of open and closed thin walled sections, single and multicell sections.
- Bending and twisting of thin plates. Structural instability; inelastic buckling, buckling of thin plates. Laminate composite structures; stress analysis, failure criteria. Stress analysis of aircraft components; fuselages, wings.
- Application of proprietary structural analysis software packages and the application of Finite Element Analysis to aircraft structures. Experiments on tapered wing spars, c-and z-section beams.

Prerequisites: ME4616, ME4226

ME4307 - BIOMATERIALS 1
ECTS Credits: 6

School of Engineering

Rationale and Purpose of the Module: Review understanding of biological systems;
- To gain appreciation for soft tissue replacement materials in current use;
- To enable the student to understand materials selection and design requirements for soft tissue replacement applications.


Prerequisites: ME4412

ME4424 - AERODYNAMICS 1
ECTS Credits: 6

School of Engineering

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

Syllabus: Review of governing equations, application of
equations to fluid flow processes
Thin aerofoil theory, aerodynamic coefficients
Finite span wings, lifting line theory, vortex flow, induced
drag, downwash, lift distribution
Boundary layer separation and control
Compressible flow, normal and oblique shock waves,
aerofoils in compressible flow
Introduction to experimental techniques

Prerequisites: ME4412

**ME4438 - COMPUTATIONAL FLUID DYNAMICS**
**ECTS Credits: 6**

**School of Engineering**

**Rationale and Purpose of the Module:** To introduce the students with a fundamental understanding of the theory and application of computational fluid dynamics (CFD) as implemented by the finite volume technique. It also provides hands-on experience with a commercial CFD code via practical computer laboratory sessions.

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

**ME4517 - ENERGY MANAGEMENT**
**ECTS Credits: 6**

**School of Engineering**

**Rationale and Purpose of the Module:** To provide an understanding of energy management as applied to a variety of engineering systems.


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

**School of Engineering**

**Rationale and Purpose of the Module:** To introduce the First and Second Laws of Thermodynamics and to apply these laws in the analysis of basic engine cycles


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

**School of Engineering**

**Rationale and Purpose of the Module:** To develop an understanding of the underlying concepts of FEA. To be able to apply the method to problems in solid mechanics and heat transfer.


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

**School of Engineering**

**Rationale and Purpose of the Module:** To give students a practical overview of industrial control systems, and their application to discrete part manufacturing, batch and continuous processes, and to provide specific exposure to the application of Programmable Logic Controllers in manufacturing and process environments

**Syllabus:** * Introduction to control systems and automation
* Programable 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.

**ME4818 - MECHANICAL DESIGN**
**ECTS Credits: 6**

**School of Engineering**

**Rationale and Purpose of the Module:** To expose the student to the practical application of design, materials, mechanics and strength of materials and the design of complex mechanical systems. The work will focus on the appropriate use of Standards, Charts and Design Guides illustrating the oft times empirical nature of applied engineering tasks. Underpinning each topic will be constant reference to the evolution of the practices and their relationship to current theory. In particular, there will be constant reference to the life and

ME5031 - DESIGN METHODOLOGY
ECTS Credits: 6

School of Engineering

Rationale and Purpose of the Module: To introduce the student to the concept and practice of a structured approach to engineering design. The student will be exposed to design philosophy, methodology and management bringing him through from problem formulation to finished engineering drawings. Engineering drawing forms a backbone to the Module through use of freehand orthographic drawing, isometric and realistic sketching, rendering and structured manual drawing techniques.

Syllabus: [Responsibilities of the Designer. (Social, Legal, Environmental and Technical)]

[Structured Design Methodology.]
Problem / Market Research and Problem Definition; Specification Development; Concept Origination / Development; Concept Evaluation and Rationalisation; Decision Making Techniques; Design Tightening; Detail Design Considerations and Practice. [Design Recording and Presentation Techniques.] Data Recording using Freehand and Orthographic Sketching; Concept Development and Presentation; Rendering Techniques; Modelling Technology and Practice. Design Layout / Workout Drawings. ; [Engineering Communications]
Assembly Drawings and Structured Parts Lists / Materials Schedules; Manufacturing Considerations and Production Planning Constraints

Prerequisites: ME4611, PE4112

ME6001 - FUNDAMENTALS OF CONTINUUM MECHANICS
ECTS Credits: 6

School of Engineering

Basic concepts and definitions: Concept of a continuum, continuity, homogeneity and isotropy; Elements of vector and tensor algebra. Deformation and flow: Length and angle changes: Strain tensor; Material and Eulerian description; Deformation rate tensor. Stresses: Body and surface forces; Stress tensor; Principal stresses, Stress invariants, Hydrostatic and deviatoric stresses. Fundamental laws of continuum mechanics: Mass conservation, Newtons laws, Conservation of energy. Constitutive relations: Ideal materials; Constitutive relations and equations of state; Elastic solids; Newtonian fluids. Mathematical models: Linear elastic solids; Newtonian fluids; Initial and boundary conditions. Introduction to the Finite Element method: Principle of virtual work; Finite element discretisation; Linear elastic finite-element model; Shape functions; Numerical quadrature; Mapping of elements; Solution of the finite-element equations.

Prerequisites: ME4611, PE4112

MG4031 - MANAGEMENT PRINCIPLES
ECTS Credits: 6

Management and Marketing

Rationale and Purpose of the Module: This module is designed to provide a comprehensive introduction to the area of management. It introduces students to key managerial issues and wider environmental factors affecting organisations.
**MG4045 - CHANGE MANAGEMENT**

**ECTS Credits: 6**

**Management and Marketing**

**Rationale and Purpose of the Module:**

1. To enable students to gain a deeper understanding of organisational reality through the different levels and perspectives of change inside and outside the organisation.
2. To develop a deep appreciation of the interrelationship between routines and change in terms of structure, culture, management intervention and modes of reinforcement.
3. To actively engage students to develop skills in proven approaches to managing change and crises in both for-profit and not-for-profit organisations.
4. To enable students to gain a deeper understanding of the challenges and complexity of international change management.
5. To give students a deep appreciation of the organisational and environmental roadmap of change.

**Syllabus:**

Nature of organisational change, resistance to change, understanding attitudes and behaviours towards change, managerial skills of change agents, problems facing change agents, levels of organisational change, formation of implementation paths, mobilising for change, change levers and interventions, strategic change frameworks, monitoring, control and resourcing change, evaluating change, crisis management, management of stakeholders in change and crisis management.

---

**MG4035 - INTERNATIONAL MANAGEMENT**

**ECTS Credits: 6**

**Management and Marketing**

**Rationale and Purpose of the Module:**

1. What is international management and what complexities arise when operating at the international level?
2. How do we understand differences between countries when managing internationally, and what are the implications of these differences for international managers?
3. What is the most appropriate way for firms to internationalise, and to manage and structure their activities?
4. How can we develop the managerial talents and capabilities to ensure that managers can be a success internationally?

**Syllabus:**

Introduction to International Management—definitions and key concepts; Country Competitiveness, Globalisation & the MNC; Political and Legal Determinants of International Management; Cultural Determinants of International Management and cross-cultural perspectives of management practice, convergence, divergence and crossvergence; Firm Internationalisation - Entry Strategies, Structures and the role of alliances and joint ventures; Global Leadership competences; International Assignment Cycle and repatriation.

---

**MK4005 - MARKETING INTELLIGENCE**

**ECTS Credits: 6**

**Management and Marketing**

**Rationale and Purpose of the Module:**

This course is about gathering, analyzing, and interpreting data about markets and customers, so as to make informed marketing decisions. Students will learn how to determine what information is required to make the decision, how to acquire trustworthy and relevant data, how to assess its appropriateness, and how to analyze the data to make key types of marketing decisions. The module is focused on utilising marketing data, and transforming them into actionable marketing insights, that aids in the development of effective strategy.

**Syllabus:**

Sources and Use of Marketing Intelligence, The Role of Research and Intelligence in the Marketing Organisation, Typologies of Marketing Data (Interaction, Attitudinal, Descriptive, & Behavioural Data), Research for Marketing Decision Making, Marketing Databases, Marketing Segmentation & Targeting, Loyalty Cards, New Product Development & Test Marketing, International Market Analysis, Advertising Research, Media Research, Sales Forecasting, Salesforce Automation, Marketing Automation, CRM Systems, Category Management, Store Location Techniques, Pricing Research, Customer Feedback, Key Performance Indicators Used in Marketing, Marketing Metrics, Appropriateness of Research Methods - (Survey, Questionnaire, Interviews &
**MK4027 - STRATEGIC BRAND MANAGEMENT**  
ECTS Credits: 6

**Management and Marketing**

**Rationale and Purpose of the Module:** The purpose of this module is to equip students with the fundamental concepts and theories of strategic brand management and enable them to critically engage with and apply key brand management theories and strategies to a range of relevant sectors and contexts. This level 8 marketing module provides students with specialised strategic brand management knowledge and skills, while engaging students in a range of current branding issues including the role of ethics and CSR and global branding.

**Syllabus:** The module firstly presents the history and origin of branding before focusing on brand building and managing successful brands in an increasingly globalised business environment. Brand building strategies are explored in a range of contexts including services, retailing, B2B and online. Strategic brand building is explored with strong emphasis on developing valuable, sustainable and ethical brands and managing successful brands in an increasingly globalised and digitalised context.

**Prerequisites:** MK4002

---

**MK4045 - DIGITAL MARKETING**  
ECTS Credits: 6

**Management and Marketing**

**Rationale and Purpose of the Module:** Digital marketing platforms have changed how businesses connect and communicate with customers. The technology now available to consumers has radically altered their consumption patterns. These new behaviour patterns have created significant challenges and opportunities for marketers. This module gives a background of the rapidly changing marketing practice and provides students with the conceptual tools for digital marketing and online social networks. Students will understand the magnitude of digital and social media and how to apply it to within Business-to-Consumer (B2C) and Business-to-Business (B2B) markets. Students will learn about cutting-edge digital marketing concepts, techniques and strategies used within industry. Furthermore, students will understand how to leverage mobile and location-based technology for marketing purposes. After this module, from a practical perspective the student will be capable of developing and managing digital marketing campaigns.

**Syllabus:** Introduction to Digital Marketing Theory; Consumer Behaviour and Digital Media; Online Identities; Evolution of Digital Marketing Landscape; Understanding Business-to-Consumer (B2C) and Business-to-Business (B2B) marketing in this new landscape; Social Media & Content Marketing Platforms (Social Networks, Discussion Boards, Blogging, Micro-Blogging, Widgets, Crowd Sourced Content, Social Curation, Social Marketplaces, Wikis, Social Bookmarking); Search Engine Marketing; PPC Advertising; Search Engine Optimisation; Email Marketing Campaigns; Website Analytics; Building a Digital Brand; Typologies of Online Brands; Digital Products & Freemium Business Model; Online Communities Creation and Curation; User Generated Content & Co-Creation; Mobile and Location-based Marketing; Content Marketing Development, Online PR & Reputation Management; Planning a Social Media Campaign; Impact of Gamification; Word of Mouth and Viral Marketing; Social Media Metrics; Monitoring, Measuring and Management of Social Media Campaigns; Omni-channel - Integration of Digital Marketing with Traditional Marketing Activities; Digital Privacy and Protection; Ethical Digital Marketing Practice, Trends in Digital Marketing.

---

**MN4007 - PROJECT MANAGEMENT THEORY AND PRACTICE**  
ECTS Credits: 6

**Management and Marketing**

**Rationale and Purpose of the Module:** The primary objective of this module is to provide students with the knowledge, skills and understanding necessary to apply
Project Management principles, tools and techniques to help initiate changes to achieve specific pre-determined project objectives in line with organisational goals and strategies. The module will prepare students for the workplace by developing their understanding of Project Management knowledge areas and Project Management processes. The student will benefit from understanding how projects are initiated, implemented, monitored and controlled within a change environment.

**Syllabus:**
Project management organisational strategy and change, project portfolio management, programme management, project lifecycles, project processes, project management strategies and approaches, projects, operations and change, project human resource management, role of the project manager-change agent, project leadership, role of the project team, projects and organisational structures, implementing change through project leadership, role of the project team, projects, operations and change, project human resource management, project management strategies and approaches, management, project lifecycles, project processes, and change, project portfolio management, programme closure.

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.

**Syllabus:**
Finite element method: Introduction to FEM for elliptic problems: analysis of Galerkin FEM for a model self-adjoint two point boundary value problem, weak solutions, linear basis functions, matrix assembly; extension of method to two dimensions, triangular and quadrilateral elements.

**Prerequisites:** MS4404

---

**MS4021 - CALCULUS 1**
ECTS Credits: 6

**Mathematics & Statistics**

**Rationale and Purpose of the Module:** This module introduces differential calculus and analysis. It develops problem solving skills and introduces concepts such as definition, lemma, theorem, proof and different methods of proof, including direct, contrapositive and induction.

**Syllabus:**
- Basic properties of the real numbers: Important subsets (natural, integers, rationals), open and closed intervals, neighbourhoods, supremum, infimum, boundedness, compactness.
- Algebra of complex numbers: modulus, phase, Argand diagrams, de Moivre's theorem and roots of complex numbers.
- Real valued functions: Definition of function, properties of functions: one-to-one, onto, inverse function, composition of functions, parametric functions.
- Limits and continuity: Definition of limit, limit theorems, limit points, definition and meaning of continuity, examples of discontinuous functions (e.g., Heaviside step function), Squeezing Theorem, Intermediate Value Theorem, Bisection Method.
- The derivative and differentiation techniques: Differentiation from first principles, derivative of sums, products, quotients, inverse of a function, chain rule, smoothness of a function, Rolle’s theorem, Mean Value Theorem.
- Properties of transcendental functions: Including trigonometric, exponential, logarithmic and hyperbolic functions; derivatives and inverse functions.
- Applications of differentiation: Finding roots of equations (Newton’s method), Indeterminate forms (L'Hopital's rule); implicit differentiation; optimisation applications, the Second Derivative Test.

**Prerequisites:** MS4013

---

**MS4025 - APPLIED ANALYSIS**
ECTS Credits: 6

**Mathematics & Statistics**

**Rationale and Purpose of the Module:** To introduce the student to standard techniques of complex analysis, integral equations and Green's functions - and to demonstrate applications of these techniques.

**Syllabus:**
- Complex numbers: modulus, phase, Argand diagrams, de Moivre’s theorem and roots of complex numbers.
- Algebra of Complex numbers: modulus, phase, Argand diagrams, de Moivre’s theorem and roots of complex numbers.
- Real valued functions: Definition of function, properties of functions: one-to-one, onto, inverse function, composition of functions, parametric functions.
- Limits and continuity: Definition of limit, limit theorems, limit points, definition and meaning of continuity, examples of discontinuous functions (e.g., Heaviside step function), Squeezing Theorem, Intermediate Value Theorem, Bisection Method.
- The derivative and differentiation techniques: Differentiation from first principles, derivative of sums, products, quotients, inverse of a function, chain rule, smoothness of a function, Rolle’s theorem, Mean Value Theorem.
- Properties of transcendental functions: Including trigonometric, exponential, logarithmic and hyperbolic functions; derivatives and inverse functions.
- Applications of differentiation: Finding roots of equations (Newton’s method), Indeterminate forms (L'Hopital’s rule); implicit differentiation; optimisation applications, the Second Derivative Test.

**Prerequisites:** MS4013

---

**MS4027 - FUNDAMENTALS OF FINANCIAL MATHEMATICS**
ECTS Credits: 6

**Mathematics & Statistics**

**Rationale and Purpose of the Module:** This course is an introduction to financial mathematics. Using discrete-time stochastic models, the pricing and
hedging of financial derivatives in arbitrage-free markets is studied.

**Syllabus:** Introduction to Derivative Securities: Futures, Forwards, European, path-dependent, and American stock options. Introduction to Interest Rate Derivatives, with a focus on bonds and Forward Rate Agreements. Using arbitrage arguments to prove properties of options, inequalities, as well as the put-call parity. Introduction to binomial trees and risk-neutral valuation of options via replication arguments (delta-hedging).

Probability theory on finite sample spaces: conditional expectations, martingales, risk-neutral pricing. Use the concept of conditional expectation to formulate and prove the Fundamental Theorems of Asset Pricing I and II.

Value and super-replication of American put options.

Simple time-series models (ARMA(p,q)) for modelling and trading trends and mean-reversion.

**Prerequisites:** MS4035

---

**MS4035 - PROBABILITY MODELS**  
**ECTS Credits:** 6

**Mathematics & Statistics**

**Rationale and Purpose of the Module:** This module replaces module MS4213 Probability Theory. It is being created as part of major changes to LM058/LM060, brought about in part by Project Maths. The new first year module MS4222 now contains some probability and this module builds on and extends that knowledge. The intention in this module is to firmly establish the connections between probability theory and its role in statistical applications.

**Syllabus:** Continuous Random Variables: expectation and variance; uniform, normal, exponential, gamma, beta, Cauchy, Weibull, distribution of a function of a random variable. Jointly Distributed Random Variables: joint distribution functions, sums of independent random variables, conditional densities, functions of jointly distributed random variables, (sum, difference, product, and quotient of two random variables).

Properties of Expectation: computing probabilities and expectations by conditioning, conditional variance, conditional expectation and prediction.

Sampling Distributions: the central limit theorem, the t-, chi-squared and F distributions and their use as sampling distributions; joint distribution of order statistics, distribution of sample range.

Estimation: method-of-moments, fitting standard distributions to discrete and continuous data, pivotal quantities, confidence intervals.

Simulation: Monte Carlo methods, variance reduction techniques, applications of simulation.

**Prerequisites:** MS4222

---

**MS4043 - METHODS OF LINEAR ANALYSIS**  
**ECTS Credits:** 6

**Mathematics & Statistics**

**Rationale and Purpose of the Module:** The aim of this module is to introduce some more advanced concepts in Linear Algebra and Numerical Linear Algebra


---

**MS4101 - MATHEMATICAL LABORATORY**  
**ECTS Credits:** 6

**Mathematics & Statistics**

**Rationale and Purpose of the Module:** To introduce students to a symbolic algebra package (Maple) as a mathematical problem-solving tool.

**Syllabus:** [Using a symbolic algebra package (MAPLE) for the analysis and solution of simple mathematical models.] Systematic approach to scientific problem-solving. Extensive use will be made of case studies and assessment will be largely project based.

---

**MS4105 - LINEAR ALGEBRA 2**  
**ECTS Credits:** 6

**Mathematics & Statistics**

**Rationale and Purpose of the Module:** The aim of this module is to introduce some more advanced concepts in Linear Algebra and Numerical Linear Algebra


Prerequisites: MS4102

MS4111 - DISCRETE MATHEMATICS 1
ECTS Credits: 6

Mathematics & Statistics

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

Syllabus: Review of sets and operations on sets, power sets.
Propositional logic, truth tables, propositional calculus, equivalence.
Predicate logic, quantifiers, equivalence, application to (mathematical) proof.
Cartesian product of sets, relations, equivalence relations, matrix representation of relations, composition of relations, functions, types of functions.
Number systems, natural numbers, integers, rationals, reals, axioms for N, proof by induction, recursive definitions and algorithms, recurrence relations.
Representations of N (binary, octal, etc), other number "fields".
Introductory combinatorics, permutations, combinations.

MS4117 - DISCRETE MATHEMATICS 2
ECTS Credits: 6

Mathematics & Statistics

Rationale and Purpose of the Module: To give the student an understanding of the mathematics and applications of Graph Theory. The applications to networks and to algorithms in Computer Science will be emphasised.

Syllabus: Graphs, directed graphs and their computer representation.
Planar, Hamiltonian and Eulerian graphs.
Graph algorithms (Kruskal, Dijkstra, DFS, BFS etc)
Graph coloring with applications to scheduling.
Network flows and matchings.
Other topics will be covered from time to time: Ramsey Theory, random graphs, Huffman codes, graph drawing, Petri nets.

Prerequisites: MS4111

MS4131 - LINEAR ALGEBRA 1
ECTS Credits: 6

Mathematics & Statistics

Rationale and Purpose of the Module: The aim of this module is to introduce students to the main ideas of Linear Algebra and its many applications. The emphasis is on developing the student’s ability to perform calculations on and with matrices, particularly 2x2 and 3x3 matrices, and on and with vectors in 2 and 3 dimensions. These ideas are then extended to higher dimensions.

Vectors in 2 and 3 dimensions: geometric interpretation of vectors, vector arithmetic, Euclidean norm, Euclidean scalar product, angle, orthogonality, projections, cross product and its uses in the study of lines and planes in 3 dimensions.
Lines and planes in 3-dimensional space: parametric equation of a line, distance between a point and a line, point-normal form and general form of the equation of a plane, distance between a point and a plane.

Extension to vectors in n dimensions;
Systems of linear equations and their solution: Gaussian elimination methods (Gauss, Gauss-Jordan) and inverse matrix method;
Matrices acting on vectors: eigenvalues and eigenvectors particularly in 2 and 3 dimensions.
Applications: least squares fit, rotation matrices.

MS4214 - STATISTICAL INFERENCE
ECTS Credits: 6

Mathematics & Statistics

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

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

-----------------------------------------------------------------------------------------------------------------------------

**MS4215 - ADVANCED DATA ANALYSIS**

**ECTS Credits:** 6

**Mathematics & Statistics**

**Rationale and Purpose of the Module:** Applies the theory developed in MS4213 and MS4214 to the development of advanced data analytic methods with particular emphasis on linear models. Students are introduced to a range of statistical packages.

**Syllabus:** Simple Linear Regression: calibration, reverse prediction, regression through the origin, analysis of residuals, regression diagnostics, leverage and influence. Matrix formulation of the linear model: Multiple regression, partial correlation, polynomial regression. Analysis of Variance: One-way ANOVA, multiple comparisons, Two-way ANOVA, Interactions, Analysis of covariance. Introduction to Generalized Linear Models including nonlinear regression, logistic regression and log-linear models.

**Prerequisites:** MS4213, MS4214

-----------------------------------------------------------------------------------------------------------------------------

**MS4315 - OPERATIONS RESEARCH 2**

**ECTS Credits:** 6

**Mathematics & Statistics**

**Rationale and Purpose of the Module:** This module introduces further OR techniques for decision-making. The student will be able to apply these techniques to real life problems.

**Syllabus:** Integer programming - pure integer programming algorithms, branch & bound solutions to mixed integer programming.

Deterministic dynamic programming - forward and backward recurrence formulations.

Probabilistic dynamic programming - finite and infinite stage problems.

Game Theory - Concepts of equilibrium, matrix games, extensive form games and repeated games.

Applications of game theory - models of economic competition (Cournot, Bertrand), evolutionary game theory.

**Prerequisites:** MS4213

-----------------------------------------------------------------------------------------------------------------------------

**MS4403 - ORDINARY DIFFERENTIAL EQUATIONS**

**ECTS Credits:** 6

**Mathematics & Statistics**

**Rationale and Purpose of the Module:** To introduce and consolidate the concepts and techniques necessary for solving ordinary differential equations (including non-linear ordinary differential equations and phase plane techniques).

**Syllabus:** Classification, initial and boundary value problems.

Review of first order equations: separable equations, linear and non-linear equations, integrating factors, exact equations, homogeneous equations; existence and uniqueness; applications e.g., in mechanics, population dynamics.

Second order linear equations, homogeneous with constant coefficients, linear independence and Wronskian, inhomogeneous equations, variation of parameters, applications in oscillators, higher order linear equations, systems of equations.

Series solution of second order linear equations, regular and singular points, Bessels equation.

Sturm-Liouville theory

Nonlinear ODEs: ad-hoc solution techniques, introduction to the concepts of stability and phase plane techniques.

**Prerequisites:** MS4402

-----------------------------------------------------------------------------------------------------------------------------

**MS4407 - PERTURBATION TECHNIQUES AND ASYMPTOTICS**

**ECTS Credits:** 6

**Mathematics & Statistics**

**Rationale and Purpose of the Module:** To learn the basic concepts and techniques of asymptotic and perturbation methods.

**Syllabus:** Non-dimensionalisation, scaling, ordering, definition of asymptotic series, algebraic equations, integrals, Laplace's method, method of steepest descent, regular and singular perturbations, multiple scales, strained coordinates, boundary layer techniques.

**Prerequisites:** MS4403, MS4404

-----------------------------------------------------------------------------------------------------------------------------

**MS4613 - VECTOR ANALYSIS**

**ECTS Credits:** 6

**Mathematics & Statistics**

**Rationale and Purpose of the Module:** To introduce the basic concepts and techniques of asymptotic and perturbation methods.

**Syllabus:** Non-dimensionalisation, scaling, ordering, definition of asymptotic series, algebraic equations, integrals, Laplace's method, method of steepest descent, regular and singular perturbations, multiple scales, strained coordinates, boundary layer techniques.

**Prerequisites:** MS4403, MS4404

-----------------------------------------------------------------------------------------------------------------------------
Rationale and Purpose of the Module: * To review the basic tools of linear algebra.  
* To introduce the student to the laws of physics in vector form. 
* To give the student a solid grounding in vector analysis.

Syllabus: [Vectorial Mechanics:] rotation of axes, index notation, review of vector and scalar algebra (scalar vector and triple scalar products); vector functions of a real variable, functions of time; differentiation of vectors, derivative of dot and cross products, tangent to a curve, arclength, smoothness, curvature, applications in mechanics. 
[Fields:] scalar and vector fields; functions of several variables, maxima/minima, contour maps, directional derivative and gradient vector of scalar fields; divergence and curl of vector field; applications in electromagnetism and fluid mechanics; vector identities; cylindrical and spherical coordinates. 
[Line, surface and volume integrals] line integrals and work; conservation of energy and potential function; applications to planetary dynamics, area, surface and volume integrals; Gauss's Greens and Stoke's theorems. Multiple integrals in radial, cylindrical and spherical coordinates, scalar and vector potentials, Helmholtz's theorem. 
[Tensor Algebra and Calculus:] Review of matrix algebra introducing suffix notation; definition of determinant; evaluation of determinants by row and column expansions; eigenvalues and eigenvectors, introduction to Cartesian tensors. 

Prerequisites: MA4607, MS4404

MT4105 - QUALITY SYSTEMS  
ECTS Credits: 6  
School of Engineering

Rationale and Purpose of the Module: This course provides a concise introduction to quality management systems such as ISO 9001 and shows how these are integral to the success of Irish industry. Other management system including environment and health and safety are also introduced.

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

MS4627 - MATHEMATICS OF NATURAL PHENOMENA  
ECTS Credits: 6  
Mathematics & Statistics

Rationale and Purpose of the Module: To introduce the concepts of modelling natural phenomena (biological and geophysical systems)

Syllabus: Evolutionary game theory: populations, strategies, evolutionary success  
Dimensional analysis: scaling, similarity.  
Fractals  

Waves: frequency, wave vector, phase velocity, group velocity  
Stability: steady solution of PDEs and small perturbations, harmonic disturbances, normal modes  
Boundary layer theory: flow near a plate, the Blasius problem  

Prerequisites: MS4602, MS4022

MT4101 - INTRODUCTION TO MATERIALS  
ECTS Credits: 6  
School of Engineering

Rationale and Purpose of the Module: To put the subject of Materials Science into historical and modern perspective  
To acquaint students with the range of materials available and their classification  
To explain the origins of materials, their processing, properties and applications

Syllabus: [Historical background to development of materials and of the subject of Materials Science].  
[Classes of modern materials]:  
- [metals] and alloys  
- [polymers] and rubbers.  
- [ceramics and glasses]  
- [composites] including concrete, wood, fibre-reinforced plastics and metal matrix composites.  
[Origin of these materials]:  
- brief outline of extraction of metals from ores and of processing by casting and mechanical treatment.  
- introduction to polymerisation reactions and processing techniques of `plastics'  
- overview of manufacture of ceramics, refractories and glasses.  

[Properties] of the different classes [and standard testing techniques]:  
- mechanical properties  
- physical properties  
- chemical properties.  

[Applications] of different materials [related to] their [properties]  

Effects of temperature on polymers and metals. Mechanical and thermal treatments and properties of alloys.
MU4001 - CRITICAL ENCOUNTERS WITH IRISH MUSIC AND DANCE  
ECTS Credits: 6  
Humanities  
Rationale and Purpose of the Module: This module is an introduction to the growing field of traditional music and dance studies and will give the student an overview of some of the important features of these traditions as well as current areas and modes of research in this context. The investigations presented in these modules will be particularly informed by the international disciplines of Arts practice research, ethnomusicology and ethnochoreology. Students here will also be introduced to responsible and accountable academic and research practices.

Syllabus: Issues addressed in this module will be taken from current research engagements with the concept of world music and dance and will examine a selection of diverse practices that are seen to constitute and sometimes challenge this category. These will critically engage historical narratives, conceptual structuring and evolving identities of the concepts and traditions in question. A particular Arts practice lens will be engaged so students can experience the aesthetic and structure of the tradition per formatively. Students will be develop writing and presentation skills associated with such academic engagement and be introduced to concepts of research as a creative, scholarly practice.

MU4017 - SECOND INSTRUMENT STUDIES ONE  
ECTS Credits: 6  
Humanities  
Rationale and Purpose of the Module: This module allows students on the BA Performing Arts to develop performance skills in a second instrument. Students will have the opportunity to critically engage embodied expressions of performance practice on an instrument and or practice other than that in their core Practicum A module. Students will engage these studies in a environment informed by recent principles in arts practice research. This module will give students invaluable new perspectives on their creative and artistic potential. This is an elective module to be offered throughout the BA in Performing Arts programme and is subject to the Irish World Academy being able to source appropriate expertise and resources.

Syllabus: Students in this module will develop a second instrumental performance area in small group and one-on-one contexts. No previous experience of the adopted instrumental practice is necessary. Students will develop and document an appropriate practice regime as well as use reflective tools such as auto-ethnographic journals.

MU4021 - INTRODUCTION TO SONGWRITING  
ECTS Credits: 6  
Humanities  
Rationale and Purpose of the Module: The purpose of this module is to introduce students to the relevant skills and basic creative processes entailed in songwriting. By creating new work in a collaborative environment, students will develop as reflective artists and composers, engaging in meaningful self and peer-to-peer critique.

Syllabus: Through weekly workshops, students will experiment with different methods of developing original songs, considering simple elements of melody, lyrics and structure of song. Through weekly lectures and engagement with post-graduate students of MA Songwriting, students will be exposed to a range of different songwriters of varying genres and styles. They will be encouraged to locate their own creative practice within the wider experience of songwriting, engaging in reflective practice through group discussion, and individual journaling and self-evaluation.

MU4023 - VOICE STUDIES: HISTORICAL AND CROSS CULTURAL PERSPECTIVES  
ECTS Credits: 6  
Humanities  
Rationale and Purpose of the Module: This module is an introduction to the field of voice studies and will provide the student with historical and cross-cultural perspectives on singing and voice training. Informed by a transdisciplinary understanding of singing across music cultures, the student will engage with important sources and current research in areas of vocal pedagogy, ethnomusicology and arts practice research.

Syllabus: This module will offer a critical engagement with historical, contemporary and cross-cultural perspectives on singing and voice training, introducing the student to contextual theories and ideologies related to their primary field of practical study.

MU4033 - WORLD MUSIC AND DANCE SURVEY 1  
ECTS Credits: 6  
Humanities  
Rationale and Purpose of the Module: This module introduce students to aspects of sound and movement from around the world, questioning the nature of what is ‘World Music and Dance’ in the 21st century digital age.

Syllabus: This module will examine a selection of music and dance expressions from diverse places round the
globe. Students will study the music and dance in the context of ‘world music’ with a specific focus on India, England, Scandinavia, West Africa, Scotland, Brittany, Galicia, North America and Indonesia. This module will be assessed through course-work and exam.

---

**MU4135 - IRISH TRADITIONAL MUSIC 1**

**ECTS Credits:** 6

**Humanities**

**Rationale and Purpose of the Module:** This module is an introduction to the growing field of traditional music and dance studies and will give the student an overview of some of the important features of these traditions.

**Syllabus:**
Issues addressed in this module will be dance tune types and structure, English language song tradition, instrumentation, traditional music and dance in America in the first half of the twentieth century, the harp tradition to 1800, modern step dancing, ceili dancing.

---

**MU5003 - TECHNIQUE, REPertoire AND STYLE - 3**

**ECTS Credits:** 12

**Humanities**

**Rationale and Purpose of the Module:** The module focuses on the individual instrument. The purpose of the module is the facilitation of performance tuition to the highest standard.

The module provides progressive tuition, within the framework outlined in Technique, Repertoire & Style 1 and Technique, Repertoire & Style 2.

The ultimate goal of the module is to improve the quality of the music making and artistry demonstrated by the student and to prepare for public performances aiming towards professional level.

**Syllabus:** The module comprises of intensive study within the framework of studio teaching and master classes. The module is based on skill and competency of execution. Contact time with individual teachers concentrates on increased repertoire and more advanced skills and technique.

The knowledge is structured within three key areas:

1. Instrumental skills aiming towards technical fluency and mastery
2. Repertoire knowledge relevant to the instrument
3. Stylistic knowledge working towards informed choices of interpretation

The foundations of repertoire and style formed in Technique, Repertoire & Style 3 will be built upon the consolidation of skills learned in Technique, Repertoire and Style 1 & 2, as well as development of more advanced skills and technique.

The materials and pedagogical direction of this module, because of its one-to-one tuition and highly individualistic approach is open to the teachers interpretation and revision in actual practice.

---

**MU5023 - MUSIC THERAPY FIELDWORK PRACTICE 2**

**ECTS Credits:** 12

**Humanities**

**Rationale and Purpose of the Module:** To provide students with the opportunity to develop skills in

1. Providing weekly regular clinical work to clients in a health, welfare, community or education setting
2. Learning in context to apply the framework of assessment, programme planning, implementation, evaluation and reporting

**Syllabus:** Students will continue a fieldwork placement alongside a qualified music therapist in a health, welfare, community or educational setting in Ireland up to two days per week. In this supervised fieldwork placement students will develop competencies in planning and leading sessions with music therapy clients. Students will gain information about the role of the facility in addressing needs of clients and the role of music therapy within the broader operational remit of the facility.

---

**MU5033 - MUSIC THERAPY PRACTICE 2**

**ECTS Credits:** 12

**Humanities**

**Rationale and Purpose of the Module:** This module is focussed on psychodynamic and psychosocial approaches within music therapy practice including the following areas: adults in mental health contexts, medical contexts and community work, music therapy in addressing the needs of medical patients.

**Syllabus:** Through a series of expert lectures and self study, students will develop an understanding of psychodynamic and psychosocial approaches within music therapy practice. Core theoretical frames to inform family work, and work with adults in mental health contexts, medical contexts and community work will be presented. Adult mental disorders û major diagnostic categories eg Schizophrenia, Depression and Bi-Polar disorder û will be covered. The role of music therapy in addressing the needs of medical patients will be presented. Students will attend a weekly experiential group. Clinical improvisation skills will be extended.

**Prerequisites:** MU5211

---

**MU5043 - MUSIC THERAPY PROJECT 1**

**ECTS Credits:** 6

**Humanities**

**Rationale and Purpose of the Module:** For students to develop a music therapy research from idea to ethical clearance stage.

**Syllabus:** Development of research from idea through to ethical clearance. Students will examine issues in research design including choice of data collection methods and methods to analyse data. Students will consider issues around ethics in research, including informed consent, management of sensitive materials, and the role of the researcher in managing participation.

**Prerequisites:** MU5071

---

**MU5053 - ENSEMBLE 3**

**ECTS Credits:** 12

**Humanities**

**Rationale and Purpose of the Module:** The module involves progressive training in String Chamber Ensemble and String Chamber Orchestra according to the framework outlined in Ensemble 1 & 2.
MU5061 - ARTS IN HEALTH  
ECTS Credits: 6  

Humanities  

Rationale and Purpose of the Module:  The aim of this module is to provide an overview of the history and the theory of ethnomusicology since the 19th century and to understand its close connections to social and cultural theory of ethnomusicology since the 19th century and to understand its close connections to social and cultural anthropology in order to equip the students with knowledge of the principle theories that have been propounded by ethnomusicologists and with issues currently under debate.  

Syllabus: Readings include both exemplary original texts drawn from the history of the field and more recent historical and theoretical overviews. Students are also asked to read and review two book-length musical ethnographies selected from a recommended list of recent works. A 5000 word essay will address a particular topic of the student's choice, designed in consultation with the course director.

MU5211 - CLINICAL ORIENTATION  
ECTS Credits: 12  

Humanities  

Rationale and Purpose of the Module: Introduction to Music Therapy concepts and methods as they relate to clinical practice.

Syllabus: The module is focused on the development of practical music making skills related to music therapy practice, observational skills and assessment and treatment planning skills.

MU5361 - RITUAL CHANT AND SONG PRACTICUM 1  
ECTS Credits: 12  

Humanities  

Rationale and Purpose of the Module:  - the development of skills pertinent to vocal accompaniment, as appropriate to specialist repertoires.  
- the provision of training in sight-singing, aural training and transcription from oral dictation  
- the development of a contextual approach to ritual vocal performance  

Syllabus: This module takes the student from his/her point of entry and expands on technical mastery and repertoire knowledge with the view of gaining insight into performance styles relevant to musical history and tradition in the classical genre.

The module is based on skill and competency of execution. The student may have to begin the module with extensive revisions in technique and a somewhat different approach to the instrument owing to the pedagogy of the professor involved.

The knowledge is structured within three key areas:
MU5411 - ENSEMBLE I  
ECTS Credits: 12  
Humanities  

Rationale and Purpose of the Module: This module features training the genre of string chamber ensemble and string chamber orchestra. An inherent part of any string players milieu is the art of ensemble playing. It must be constantly explored and used to be value as an artistic form and musical expression.  

Solo playing brings to bear the focus of individual decisions on the music itself. Ensemble playing requires a specialised skill and a particularly developed musical intelligence based on the ability to weigh musical options in the light of other individuals playing in the same continuum. 

Goals of the module include public performances and periodic interaction with professional members of the Irish Chamber Orchestra. 

Syllabus: The module is structured around two key elements / segments: 
1. String Chamber Ensemble  
2. String Chamber Orchestra  

The String Chamber Ensemble segment aims to develop and hone skills relative to the genre of string quartets, trios, quintets or larger ensemble pieces. Students are expected to work constructively in groups and take responsibility for their individual preparation and the organisation of group rehearsal times. The chamber groups are taught and coached in the context of laboratory work in forms of studio master classes with their respective teachers. 

The String Chamber Orchestra segment involves periodic interaction with members of the Irish Chamber Orchestra. The presence of the Irish Chamber Orchestra on the university campus gives young string players an insight into the professional world and working experience of an internationally acclaimed chamber ensemble. The materials and repertoire of this module and the balance of the two key segments within each semester will be at the discretion of the programme director and studio teachers based on the distribution of instrumentalists within the student body and the available periods within the work schedules of the Irish Chamber Orchestra. 

MU5501 - COMMUNITY MUSIC IN CONTEXT  
ECTS Credits: 12  
Humanities  

Rationale and Purpose of the Module: To provide instruction in foundations, history and principles of community, to offer students a brief and broad experience of the field; to combine practical and academic perspectives on Community Music; to offer this programme within an environment sensitive to an ethnomusicalological and performance perspective and which encourages cross-platform performance and learning. 

Syllabus: History, culture and political developments and issues in Community Music; gender considerations, shifting demographics, models and functions of community music and community arts, diverse learners and community contexts, case studies. 

MU5611 - TRADITIONAL IRISH MUSIC PRACTICUM  
ECTS Credits: 12  
Humanities  

Rationale and Purpose of the Module: To encourage creativity and individuality in performance practice; to develop performing skills in the context of individual and group classes; to allow the student under supervision to design and follow a specially prepared music programme tailored to his/her musical ambitions and educational needs; to develop ensemble skills. 

Syllabus: In this module the student will create and design their own performance programme under the supervision of the course director. Also, students will take tutorials with or tutors on the programme to facilitate their work-in-progress and to provide support for the successful realisation of individual performance projects. This module is in preparation for a public performance. 

MU6003 - PRACTICAL SKILLS OF MUSIC 3  
ECTS Credits: 3  
Humanities  

Rationale and Purpose of the Module: To provide further practical guidance in the area of school and classroom music. To develop extra skills specifically related to the facilitation of music learning, teaching, direction and performance. To further develop an awareness in the student of his/her position as a music educator and as a community musician within the entire school community. To further facilitate competency in essential aural, compositional and performance skills. 

Syllabus: Students will acquire further skills related to
Rationale and Purpose of the Module: Humanities in ab sessions. Cultural issues and cross-curriculum aspects are explored performing platforms, the use of ICT and of music teaching and learning styles, classroom, laboratory, numeracy will also provide a focus in practicum. Varieties music lesson. The use of music technology as a teaching harmony, counterpoint, composition, melodic and traditional Irish, popular and world musics. Dance, theatre, improvisation, accompaniment, conducting, harmony, counterpoint, composition, melodic and rhythmic writing and recognition will be central in the music lesson. The use of music technology as a teaching and learning tool, and the concept of literacy and numeracy will also provide a focus in practicum. Varieties of teaching and learning styles, classroom, laboratory, performing platforms, the use of ICT and of music technology in the classroom, international perspectives, cultural issues and cross-curriculum aspects are explored in ab sessions.

**MU6031 - PRACTICAL SKILLS OF MUSIC 1**  
*ECTS Credits: 6*

**Humanities**

Rationale and Purpose of the Module: To provide practical guidance in the area of classroom music. To develop skills specifically related to the facilitation of music learning, teaching and performance. To develop an awareness in the student of his/her position as a music facilitator in the school at large. To facilitate competency in essential aural, compositional and performance skills.

**Syllabus:** This module explores and utilises students' own performing skills and creative music making abilities in order to address the facilitation and production in the school setting of a variety of music making possibilities. Students will research and explore ensemble music, choral singing, school bands, orchestras, percussion and recorder groups, singing including vocal health, traditional Irish, popular and world musics. Dance, theatre, improvisation, accompaniment, conducting, harmony, counterpoint, composition, melodic and rhythmic writing and recognition will be central in the music lesson. The use of music technology as a teaching and learning tool, and the concept of literacy and numeracy will also provide a focus in practicum. Varieties of teaching and learning styles, classroom, laboratory, performing platforms, the use of ICT and of music technology in the classroom, international perspectives, cultural issues and cross-curriculum aspects are explored in ab sessions.

**MU6041 - MUSIC PEDAGOGY**  
*ECTS Credits: 6*

**Humanities**

Rationale and Purpose of the Module: To consider topics of pedagogy from the perspectives of specific teaching of music so as to enhance the quality of teaching practice experience. To enable students to undertake structured observation in the classroom. To develop the ability to reflect critically on one's own teaching and one's role within the school. To examine aspects of curriculum, methodology and assessment as they relate to music education. To apply current research to practice.

**Syllabus:** This module facilitates the student teacher's initial experiences in the school and in the school music department. Junior and Leaving Certificate cycle music syllabi are reviewed, critiqued and addressed in relation to issues of implementation. Transition year music programmes are explored and designed through research and reflection. Structures of subject knowledge, innovation in the classroom, practice room and concert hall/performing platform are addressed. Curriculum development, mixed ability teaching, alternative approaches to assessment and reflective evaluation, and current research are discussed and presented in a variety of national and international contexts. Varieties of teaching and learning styles, classroom, laboratory, concert hall organisation, the use of ICT and of music technology in the classroom, international perspectives, cultural issues and cross-curriculum aspects are explored in lecture and lab sessions.

**Syllabus:** The study of research methods pertains to an investigation of music therapy as an arts-dependent practice and covers contexts for arts-based research, the research process, skill-development in critical analysis, and research scholarship including writing and/or discussing research outcomes and current issues in research. This course is a prerequisite for MU5043 and introduces the beginner researcher to the tools, knowledge and critical thinking required to conduct research in their preferred clinical area of interest.

**MU6061 - MUSIC ETHNOGRAPHY**  
*ECTS Credits: 6*

**Humanities**

Rationale and Purpose of the Module: This module trains students in the epistemology, methodology, methods and techniques for sustained ethnographic inquiry.

**Syllabus:** The study of research methods pertains to an investigation of music therapy as an arts-dependent practice and covers contexts for arts-based research, the research process, skill-development in critical analysis, and research scholarship including writing and/or discussing research outcomes and current issues in research. This course is a prerequisite for MU5043 and introduces the beginner researcher to the tools, knowledge and critical thinking required to conduct research in their preferred clinical area of interest.

**NM4011 - PRINCIPLES FOR CONTEMPORARY NURSING STUDIES**  
*ECTS Credits: 6*

**Nursing & Midwifery**

**ACADEMIC CONTENT IS NOT CURRENTLY AVAILABLE FOR THIS MODULE - UPDATES ARE IN PROGRESS**

**NM4077 - LEADING AND MANAGING IN QUALITY PRACTICE**  
*ECTS Credits: 6*

**Nursing & Midwifery**

**Rationale and Purpose of the Module:** The aim of the module is to explore the principles underpinning leadership, management, quality and safety in healthcare delivery.

**Syllabus:** Roles and responsibilities of health and social care professionals, delegating and supervising care in the healthcare teams, leadership strategies/styles and analysis for effective management, teambuilding, team working, collaboration, advocacy and conflict
management, managing change in the health service; Manage organisations and systems; Principles of governance, audit, quality improvement processes and measurement of standards; Concepts underpinning a supportive clinical work environment; supporting quality, assessing and managing clinical risk and promoting safety: Time management, effective and efficient use of resources, health service reform: Contemporary issues in nursing, midwifery and health care management.

NM4091 - PHILOSOPHIES UNDERPINNING PERSON CENTRED NURSING
ECTS Credits: 3

Nursing & Midwifery

ACADEMIC CONTENT IS NOT CURRENTLY AVAILABLE FOR THIS MODULE - UPDATES ARE IN PROGRESS

NM4121 - FOUNDATIONS FOR ENGAGED LEARNING
ECTS Credits: 3

Nursing & Midwifery

ACADEMIC CONTENT IS NOT CURRENTLY AVAILABLE FOR THIS MODULE - UPDATES ARE IN PROGRESS

NM4151 - BIOLOGICAL SCIENCES APPLIED TO NURSING AND MIDWIFERY 1
ECTS Credits: 6

Nursing & Midwifery

Rationale and Purpose of the Module: To provide the foundation for understanding cell biology and tissues leading to anatomy and physiological functioning of the human system to assist in the study of the effects of illness and disease on the individual.

Syllabus: Introduction to the body as a whole, tissues, organs and systems. Biochemistry of the cell including: cell structure, the cell surface, the cell cytoplasm, and the biochemical mechanisms controlling the movement of substances into and out of the cell. Tissue structure and function including; epithelial, connective, muscle and nervous tissue. The integumentary system, skeletal system, and joints. Muscles: structure and function. Structure and function of the circulatory system, respiratory system, lymphatic system. Anatomy, physiology and biochemistry of the innate and adaptive immune system. Contribution of each system to the maintenance of homeostasis.

NS3201 - MICROBIOLOGY, IMMUNOLOGY AND INFECTION CONTROL
ECTS Credits: 3

Nursing & Midwifery

Rationale and Purpose of the Module: The aim of this module is to provide the student with a knowledge and understanding of microbiology with application to health care settings nursing and midwifery practice

Syllabus: Micro-organisms Nature of microorganisms and their growth, basic understanding of bacteria, fungi and viruses, general pathogenesis, portals of entry; cycle of infection, basic epidemiology and how an infectious agent is transferred through a population; control of spread of infection, cultivation and identification of pathogens. Pathogenesis in key infections. Infection control in the hospital and community setting, guidelines in isolation precautions. Carrier status amongst health care professionals: practice and developments. Disinfection and sterilisation of equipment. Antibiotics: mode of action in relation to specific diseases; antibiotic resistance; public health measures to ensure antibiotic efficacy: Directly Observed Therapy; reserved drugs; public and professional awareness. Microbiology in relation to nursing and midwifery care and public health awareness: such as HIV, CJD, Cl. diff., TB, and MRSA. Immunology: the immune response reviewed; antibody diversity; allergy and anaphylactic shock; the immuno-suppressed patient; immunisation in current public health programmes.

Clinical Skills: Standard precautions
Introduction to aseptic technique
Specimen observation /collection/testing, labelling, transport (sputum, urine, and blood)
Wound care and wound management
Removal of sutures and clips

NS4013 - HEALTH STUDIES
ECTS Credits: 6

Nursing & Midwifery

Rationale and Purpose of the Module: To provide nurses and midwives with the necessary foundation to develop competence in health education and health promotion.

Syllabus: Concepts of health and ill-health; Measuring health and health science; Determinants of and influences upon health. The social construction of Life styles; The history of health education and health promotion; Models and approaches to improving health; Assessing needs and programme planning; Ethical
issues; inequalities, disadvantage and empowerment; Settings for programmes; health policy and politics.

**NS4024 - INTRO. TO THE PRINCIPLES AND NATURE OF TEACHING AND LEARNING FOR NURSES AND MIDWIVES**
ECTS Credits: 9

**Nursing & Midwifery**

Rationale and Purpose of the Module: The aim of this module is to provide the students with the teaching skills necessary to facilitate teaching and learning within the nurse practice/learning environment.


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

**NS4037 - PROMOTING SUPPORTING AND PROTECTING BREASTFEEDING**
ECTS Credits: 6

**Nursing & Midwifery**

Rationale and Purpose of the Module: To enable the student to critically consider the promotion, support and protection of breastfeeding. Fulfil the requirements of the Baby Friendly Hospital Initiative including the provision of safe artificial feeding

**Syllabus:** Theoretical content: Social, cultural, psychological and political influences on aspects of breastfeeding, infant feeding; National and International Breastfeeding policies and their management, health benefits including BFHI; The importance of breast-feeding to mother and baby, Health care practices that support breastfeeding and artificial feeding; Counselling skills to support breastfeeding; Anatomy and physiology of lactation, Biochemistry of human milk, Impact of birthing practices on breastfeeding; Breastfeeding facilitation for healthy mothers and newborns; Breastfeeding management under difficult circumstances; Breastfeeding management when the mother is ill; Infants with special needs; Alternative methods of infant feeding when breastfeeding is not possible; Infant nutrition and weaning practices; Hospital and community support; Drug therapy and breastfeeding, maternal nutrition during lactation, maternal employment and breastfeeding.

Clinical skills Facilitating an antenatal workshop on positioning and attachment for breastfeeding babies. Use of support mechanisms for successful breastfeeding. Breastfeeding under special circumstances (breastfeeding the preterm baby, twins, baby with cleft lip and palate). Facilitating a postnatal breastfeeding clinic. Lactation Consultants role and challenges in protecting breastfeeding. Promoting, supporting and protecting breastfeeding in the community setting

Clinical skills
Communication skills
Positioning and attachment workshop
Breastfeeding under special circumstances (breastfeeding the preterm baby, multiple births, baby with cleft lip and palate)
Facilitating a postnatal breastfeeding clinic
Hand expression, pump expression, cup feeding, breast milk storage; safe formula feeding

**NS4047 - PREPARATION FOR PARENTHOOD**
ECTS Credits: 6

**Nursing & Midwifery**

Rationale and Purpose of the Module: To enable the student to critically consider the promotion, support and protection of breastfeeding. Fulfil the requirements of the Baby Friendly Hospital Initiative including the provision of safe artificial feeding

**Syllabus:** Philosophy and historical development of childbirth education, Principles of adult education, teaching and learning strategies for pregnancy childbirth and transition to parenthood, health promotion strategies, sexuality and cultural perspectives on childbearing and using, culturally connected teaching strategies, childbirth education for specific social groups e.g. teenagers, travellers. Teaching relaxation in parent education classes. Curriculum development for parenthood education Clinical. Tutorials: micro teaching, presentation strategies and skills Micro teaching Presentation skills Giving feedback, class planning, evaluation of teaching, giving feedback, relaxation techniques

**NS4063 - CARE OF THE NEONATE**
ECTS Credits: 3

**Nursing & Midwifery**

Rationale and Purpose of the Module: To examine the midwife's role and responsibility in assessment, planning, implementation and evaluation of student with the care knowledge and skills to assess, plan, implement and evaluate care of the neonate.

**Syllabus:** Adaptations to extrauterine life, thermoregulation, initial steps of neonatal resuscitation; Role of the midwife in assessing, planning, implementing and evaluating care for healthy newborn babies from birth to discharge. Thermoregulation, Prevention of infection in. Meeting the safety needs of the neonate. Nutritional requirements of the term neonate, physiology of lactation; promoting, supporting and protecting breastfeeding; formula feeding, parent infant attachment and psychology and perception of neonate. Principles of drug administration for the neonate. Discharge advice. Newborn bloodspot screening technique. Sudden Infant Death Syndrome. Role of the public health nurse. Vaccinations and immunisations. Transition to parenthood; parent infant attachment; infant cues and responses. Meeting diverse parenting needs, neonatal record keeping. Communicating and documenting, screening of the newborn, sudden Infant Death Syndrome, public health and the neonate, vaccinations and immunisations Assess, plan, implement and evaluate care for healthy newborn babies from birth to discharge recording clinical practice.

Clinical skills:
Examination of the neonate at birth including initial steps of resuscitation Ongoing
Checking and use of the resuscitaire On-going assessment and monitoring of the neonate including neonatal vital signs
Care of the neonate, administration of Vitamin K Breastfeeding practices Formula
Expressing and storing of breast milk
Infant feeding practices Metabolic skills
Newborn bloodspot screening technique

**NS4203 - BIOLOGICAL SCIENCES 3 ANATOMY, PHYSIOLOGY AND PATHOPHYSIOLOGY**
ECTS Credits: 6

**Nursing & Midwifery**

**Rationale and Purpose of the Module:** The aim of this module is to provide students with a foundation for understanding normal human anatomy and physiological function, considered essential for the later study of illness and disease in the individual.

**Syllabus:**
- Pregnancy, childbirth, lactation. Special Senses: Structure and function e.g. eye, ear, nose, tongue, and equilibrium.

**NS4205 - MATERNITY, PEDIATRIC AND OLDER PERSON NURSING**
ECTS Credits: 6

**Nursing & Midwifery**

**Rationale and Purpose of the Module:** The aim of this module is to facilitate students understanding of maternity, paediatric, and older person nursing so that they may provide appropriate care to individuals and families.

**Syllabus:**
- Introduction to the principles of peri-natal care; effects of pregnancy upon maternal health. Nursing care and management of mother and baby introduction to the nursing principles to the care and management of children experiencing acute and chronic illness their experiences of hospitalisation; family centred care; child protection. Dignity, advocacy and protection of the older adult; introduction to the principles of nursing the older person and family/carer across the care continuum. Attitudes towards ageing, and the normal process of aging, age related disorders, e.g. confusion, polypharmacy, falls, dignity, advocacy and restraint. Applied pharmacology.
- Clinical Skills
  - Abdominal palpation
  - Fetal heart monitoring
  - Mechanisms of labour
  - Examination of the baby and child
  - Bathing a baby
  - Bottle and breastfeeding
  - Assessment of the older person - and use of assessment tools
  - Communication and therapeutic strategies to support the older person with cognitive impairment
  - End of life care
  - Last offices

**NS4213 - PRINCIPLES OF NUTRITION NURSING**
ECTS Credits: 3

**Nursing & Midwifery**

**Rationale and Purpose of the Module:** The aim of this module is to introduce students to the role of nutrition in health care and disease prevention so that the specialist needs of a person experiencing dietary difficulties can be addressed

**Syllabus:**
- Nutrients, their functions, metabolism, food sources and optimal nutrition for the promotion and maintenance of health and prevention of disease. Absorption, digestion, and vital functions of the macronutrients (protein, carbohydrate and fat) and the micronutrients (vitamins and minerals). Changes in nutritional needs throughout the life cycle including special considerations during pregnancy, lactation, and aging. Nutritional standards, the role of nutrition in disease prevention and clinical nutrition topics including PKU, malnutrition, and dietary recommendations for diabetes. Interventions to maintain nutritional status in illness. Nutrition as an interdisciplinary approach to health care and disease prevention and its application to the individual, in community health and education. Introduction to the use of computer-based diet analysis to evaluate personal dietary intakes. The role of the nurse in meeting the specialist nutritional needs of a person experiencing dietary difficulties. Applied pharmacology.
- Clinical Skills
  - Last offices

**NS4215 - SPECIALISED NURSING CARE**
ECTS Credits: 6

**Nursing & Midwifery**

**Rationale and Purpose of the Module:** The aim is to facilitate the student understanding of oncology, palliative care, mental health, and intellectual disability so that they may provide appropriate care to these groups of individuals. In order to prepare general nurses to support patients/clients with specific and complex needs the process of identifying needs, planning, prioritising, implementing and evaluating nursing care will be considered.

**Syllabus:**

**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.

**Syllabus:**
cognitive behavioural therapy. Contingency contracting.
Cognitive behavioural assessment: observation, interviewing, measurement and problem definition.
Functional behavioural analysis. Treatment strategy groups. Relaxation techniques. Cognitive restructuring: e.g. monitoring thoughts and feelings, questioning evidence, examining alternatives, thought stopping.
Learning new behaviour: e.g. modelling, shaping, token economy, role-playing, and social skills training.
Cognitive behavioural therapy in nursing.

Rationale and Purpose of the Module: Cognitive behavioural therapy in nursing.
Nurse role in facilitating and implementing pain management interventions and evaluating outcomes. Pain management of groups with special needs, e.g. child, older person. Applied pharmacology.
Clinical Skills Syllabus:
Catheterisation, catheter care, catheter removal, Bladder care
Continence care
Enema/suppository administration,
Stoma care
Naso-gastric aspiration

---

**NS4223 - RENAL AND GASTROENTEROLOGY**
**NURSING**
ECTS Credits: 6

**Nursing & Midwifery**

**Rationale and Purpose of the Module:** The purpose of this module is to facilitate students understanding of gastro-enterological and renal disorders and the application of appropriate nursing care to an individual with such condition(s).

**Syllabus:** Gastro-enterological disorders: e.g. cirrhosis, oesophageal varices, peptic ulceration, appendicitis, colitis, pancreatitis, gastroenteritis; intestinal obstruction; nursing care and management. Renal disorders: infection and obstruction, acute and chronic renal failure; nursing care and management. Dialysis, organ transplants. Applied pharmacology. Nurses’ role and responsibilities in investigative and diagnostic procedures.

---

**NS4228 - PAIN MANAGEMENT**
**ECTS Credits:** 6

**Nursing & Midwifery**

**Rationale and Purpose of the Module:** This module offers the student an opportunity to further develop knowledge and understanding of the complexities and challenges of pain management in order to provide additional theoretical support to underpin their practice. The module also aims to build upon the knowledge gained in years one, two and three of the programme enabling the student to address complex care management issues.

**Syllabus:** The multidimensional nature of pain; The physiology of nociceptive and neuropathic pain. The effects of pain physical, psychological social and spiritual aspects individual reactions and manifestations; Pain tolerance and pain responses; Barriers to effective pain management.; Interventions to alter sensory input and reduce pain perception. The role of the nurse as a member of the healthcare team e.g. Assessment and measurement of pain planning and implementing pain management interventions and evaluating outcomes. Pain management of groups with special needs, e.g. child, older person. Applied pharmacology.

---

**NS4305 - NURSING THE CHILD AND ADULT WITH BEHAVIOURAL DISORDER**
**ECTS Credits:** 6

**Nursing & Midwifery**

**Rationale and Purpose of the Module:** The aim of the module is to critically evaluate current attitudes policies and practices that support persons with an intellectual disability and associated behavioural or mental health difficulties.

**Syllabus:** Human behaviour, adaptive and maladaptive responses Role of the RNID in supporting and assisting the individual with an intellectual disability experiencing mental health difficulties, e.g. phobias, eating disorders, stereotypical, aggressive and violent behaviours.
Behavioural and cognitive therapies and the nursing process. Mental health difficulties across the life span.
Concept of dual diagnosis in intellectual disability.
Nursing care and management of the child and adult with an intellectual disability experiencing mental health difficulties, e.g. phobias, eating disorders, stereotypical, aggressive and violent behaviours; anxiety disorders; psychosexual disorders; perceptual and mood disorders, schizophrenia, depression. Habit and conduct disorders, attention deficit disorders with or without hyperactivity. Applied pharmacology.
Clinical skills
Risk assessment skills of observation and monitoring behavioural management strategies

---

**NS4315 - NURSING AND ALLIED THERAPIES**
**ECTS Credits:** 6

**Nursing & Midwifery**

**Rationale and Purpose of the Module:** The purpose of this module is to apply and analyse creative mediums which support the development of life skills for persons with an intellectual disability.

**Syllabus:** The role of the nurse in facilitating and processing diversional and recreational activities for persons with an intellectual physical/sensory disability. The role of creative mediums in health promotion, inclusion, choice and empowerment and reflection for people with intellectual disabilities. The use of drama to promote education, skill development and advocacy in the lives of people with an intellectual disability. Occupational and recreational social and self-help skills, for example swimming. Introduction to movement as an educational medium; expressive and creative movement skills for example drama, dance and mime, Creative games in group work. Strategies and techniques for implementing creative sessions for persons with an intellectual disability for example arts and crafts, puppetry.

Clinical Skills
Arts and crafts
Drama
Dance
 Mime
Puppetry skills

---

**NS4323 - NURSING ADOLESCENTS AND ADULTS WITH INTELLECTUAL DIS**
**ECTS Credits:** 6

**Nursing & Midwifery**

**Rationale and Purpose of the Module:** The aim of this module is for each student to develop knowledge and skills required to support the person with an intellectual disability through adolescence and adulthood with their development.
The physical health status of persons with mental illness.

Syllabus:
Pharmacology.
Understanding of physical illnesses which are common in patient care and work skills training. Therapeutic and creative activities including leisure and recreational provision for adolescents and adults. Life skills development. Interpersonal relationships and sexuality; sex education. Moral development: values and spirituality. Relationship between spiritual well-being and physiological/psychological health.

Clinical Skills Syllabus:
- Catheterisation, enema/suppository administration and stoma care
- Assess living skills
- Life skills development
- Interpersonal relationships and sexuality: sex education

---

**NS4423 - ALTERED HOMEOSTASIS AND MENTAL HEALTH**

ECTS Credits: 6

**Nursing & Midwifery**

Rationale and Purpose of the Module: The purpose of this module is to develop Mental Health students' appreciation of the importance of holistic approach to patient care and to develop knowledge and understanding of physical illnesses which are common in mental health care.

Syllabus:
The inter-relationship between mental and physical health.
The physical health status of persons with mental illness.
The role of the nurse in promoting the health of this service user group. The aetiology, signs, symptoms, treatment and nursing care of physical illnesses which commonly present in mental health care e.g. diabetes, thyroid disorders, respiratory and circulatory disorders, urinary tract infections, incontinence and constipation. Somatoform disorders: presenting features and nursing care of persons with somatoform disorders. Applied pharmacology.

Clinical Skills
- Catheterisation, catheter care, catheter removal.
- Stoma care

---

**PA4001 - INTRODUCTION TO PUBLIC ADMINISTRATION 1**

ECTS Credits: 6

Politics and Public Admin

Rationale and Purpose of the Module: This module will introduce students to the study of Public Administration. It will identify the characteristics of Public Administration as an academic study and a practitioner focus. It will present the main ideas and concepts in the traditional model of public administration - bureaucracy, politics-administration dichotomy, scientific management - and their application. The module will then explore the rationale for contemporary ideas about public management and governance, reforming public sector organisations and attempts to deliver public services efficiently and effectively.

This module will be offered on the new BA Arts programme

Syllabus:
- Part 1 Introduction:
  - What is Public Administration?
  - Differences between ‘public’ and ‘private’ Characteristics of public goods
  - The role and functions of government

- Part 2 - Traditional Model of Public Administration
  - Patronage and spoils to the Northcote-Trevelyan reforms
  - Max Weber and bureaucracy
  - Woodrow Wilson and the politics-administration dichotomy
  - Public choice critique

- Part 3 - Reforming Public Administration
  - Managerialism
  - New Public Management
  - E-governance
  - Accountability: theory and practice
  - Street level bureaucracy
  - New Public Governance
Rationale and Purpose of the Module: Using a comparative and thematic approach (within a Joint European Module subscribed to by 11 European universities) this course aims to explore various systems of subnational government, the changing relationships between the different levels of government and to examine the origin, nature and implications of the challenges facing sub-national governments in Europe.

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

PD4003 - ERGONOMICS FOUNDATION
ECTS Credits: 6

School of Design

Rationale and Purpose of the Module: Upon completion of this module students will be able to; Explain the ergonomics approach. Compute basic statistical metrics to describe inter individual differences in physical and cognitive abilities. Apply statistical data describing populations abilities in the design of products or work systems. Explain the physiological basis of energy liberation in the cardiovascular system. Understand the basis for human motor control and be able to explain and apply Fitts equation. Derive an expression to explain information processing rates in humans and apply the theory in the design of displays and controls.

Syllabus: History of Ergonomics Domains of specialisation in ergonomics. Human variability and user fit, anthropometry, conducting anthropometric surveys, fitting trials, the normal distribution and statistical aspect of variability, standards in anthropometry. Minority groups, needs of older and younger people, user centred design, inclusive design, design for all. Biomechanics of body forces, hand tool design, internal and external forces of the upper limb, muscle fatigue, endurance models, modelling fatigue. Psychophysical studies of user physical interaction, theories of comfort and discomfort, repetitive strain injuries, conducting studies, Ethics and user studies.

to usability, generations of user interfaces, human factors methods to study user interaction, models of usability, usability engineering lifecycles, principles of usable design, designing for usability, methods for usability evaluation, planning and conducting usability evaluations, analysing usability data, reporting on user studies, usability informing design, heuristics, standards and usability, systems analysis of user products, product experience, product attachment, designing for comfort, affective meaning, Kansei methods, observing the user experience, measuring user experience.

PD4005 - ADVANCED MODELLING OF FORM
ECTS Credits: 6

School of Design

Rationale and Purpose of the Module: The module aims to develop students skills in expression of organic form in a 3 dimensional digital environment. Enhancing these skills will further augment the learners appreciation of complex 3D form and downstream uses of Computer Aided Design in manufacturing, rapid prototyping & digital representation & visualisation.


*PD4005 Must be taken with PD4105 and PD4115

PD4015 - USABILITY ENGINEERING
ECTS Credits: 6

School of Design

Rationale and Purpose of the Module: Upon completion of this module students will be able to; Plan and conduct usability evaluations of products Critically evaluate the quality of their ergonomics research skills Determine and apply relevant ISO standards for usability evaluation Appreciate the principles of inclusively in design Appreciate the implications of the psychology of individual differences on product design Test and apply theories of user experience in product design Use human factors methods to inform the design process to achieve high levels of user satisfaction.

Syllabus: The user and product interaction, introduction to usability, generations of user interfaces, human factors methods to study user interaction, models of usability, usability engineering lifecycles, principles of usable design, designing for usability, methods for usability evaluation, planning and conducting usability evaluations, analysing usability data, reporting on user studies, usability informing design, heuristics, standards and usability, systems analysis of user products, product experience, product attachment, designing for comfort, affective meaning, Kansei methods, observing the user experience, measuring user experience.

PD4024 - DESIGN FOR ENVIRONMENTAL SUSTAINABILITY
ECTS Credits: 6

School of Design

Rationale and Purpose of the Module: To familiarise students with issues relating to energy consumption, and the realisation of current exhaustible engineering activities which is essential for a change towards sustainable production. To present environmental impact assessment and ecological foot-printing of products and processes used in the critical realisation of current unsustainable engineering trends. To equip students with abilities to perform environmental audits on products and processes. To outline all relevant legislative requirements relating to environmental aspects of products and processes, which is a key component of an environmental audit. To provide an understanding and realisation of how sustainable design begins with the concept stages of a product.

To equip students with the skills and capacities to meet the emerging technological trends, professional practice, current industry requirements and to realise design ideas to a professional standard. To practically apply the design process to develop innovation and industrial demands. To introduce tools, techniques and methods applicable to a variety of fields. The real-world problems will focus on professional practice, current industry requirements and emerging technological trends. To equip students with the skills and capacities to creatively solve real-world problems across a wide variety of fields. To introduce tools, techniques and methods applicable to innovation and industrial demands. To practically apply the design process to develop and realise design ideas to a professional standard. To develop and advance design skills in emerging market areas including medical devices, consumer products and electronics. To expand student knowledge and practical application of mechanical reasoning, manufacturing and materials, and design detailing. To develop critical thinking skills and complex problem solving abilities. To develop advanced design skills, including real-world research, ethnography, sketching, model-making, design visualisation, professional practice, communication, prototyping and user testing, advanced human factors. The teaching model will predominantly be a learning by doing process, where a mix of lectures, projects, workshops and design projects will blend to provide students with a mix of practical and applicable professional skills. This approach will teach students core skills needed to identify new opportunities, abstract problems, generate and develop a wide range of solutions, as well as building and realising the most appropriate solutions.

**School of Design**

**Rationale and Purpose of the Module:** The aim of this module is to build on the design skills developed through the previous Design Studio modules through a series of industry focused projects. These projects, conducted with Industry partners will bring the students through the entire design process from early research and conceptualisation to final design and design for manufacture. The real-world problems will focus on professional practice, current industry requirements and emerging technological trends. To equip students with the skills and capacities to creatively solve real-world problems across a wide variety of fields. To introduce tools, techniques and methods applicable to innovation and industrial demands. To practically apply the design process to develop and realise design ideas to a professional standard. To develop and advance design skills in emerging market areas including medical devices, consumer products and electronics. To expand student knowledge and practical application of mechanical reasoning, manufacturing and materials, and design detailing. To develop critical thinking skills and complex problem solving abilities. To develop advanced design skills, including real-world research, ethnography, sketching, model-making, design visualisation, professional practice, communication, prototyping and user testing, advanced human factors. The teaching model will predominantly be a learning by doing process, where a mix of lectures, projects, workshops and design projects will blend to provide students with a mix of practical and applicable professional skills. This approach will teach students core skills needed to identify new opportunities, abstract problems, generate and develop a wide range of solutions, as well as building and realising the most appropriate solutions.


*PD4105 Must be taken with PD4005 and PD4115

**PD4115 - DESIGN STUDIO 6 (COMMUNITY)**

**ECTS Credits:** 6

**School of Design**

**Rationale and Purpose of the Module:** This module facilitates students to see the impact their work will have on individual users and society as a whole. Focusing on team projects and collaborative work, students will work through design issues and complex problems to develop solutions that improve the lives of users and community (both local and international).

To introduce tools, techniques and methods applicable to innovation and effective problem solving.

To develop the skills and capacities for effective team working.

To demonstrate to students the link between design and user behaviour.

To advance design skills, including research skills, sketching, model-making & prototyping, design visualisation, presentation, communication and user testing.

To explore and implement complex real-world research techniques to gather information, and then to apply tools to synthesise, analyse and transform the information into usable design guides.

To allow students to integrate all stages of the design process. To introduce students to the tools, concepts and techniques underpinning Service Design, Universal/ Inclusive Design and Design for Social Innovation. To introduce students to responsible design practice (ethics, social & cultural inclusion, diversity of practice). To develop skills in systems thinking and critical analysis.

Learning by doing is the predominant teaching model with a combination of projects, workshops, field trips and lectures to introduce students to the complex topics behind understanding and designing for user and societal needs. The practical approach encourages students to address problems from different and holistic perspectives as well as generating and realising the most appropriate solutions to current contemporary problems.


*PD4115 Must be taken with PD4005 and PD4105

**PH4003 - MECHANICAL ENERGY**

**ECTS Credits:** 6

**Physics**

Mechanical vibrations, simple harmonic and damped
simple harmonic motion, quality factor, forced oscillations, coupled oscillations. Waves, transverse and longitudinal waves, phase and group velocity, energy transported by waves, reflection and transmission of waves. Review of the principles of mechanics: inertial forces. Rigid bodies: rotation and moments of inertia, angular momentum and kinetic energy, torque. Fluid dynamics: Bernoulli equation, equations of motion in integral form, equations of motion in differential form, kinematics, vorticity, potential flow, dimensional analysis, viscous flows, exact solutions, pipe flow, laminar boundary layers, boundary layer solution methods, turbulence. Fluid heat transfer and a thorough understanding of how these disciplines apply to the design and analysis of complex thermal fluid systems.

Applications to Ocean, Hydro and Wind renewable energy systems.

PH4005 - INTRODUCTION TO COMPUTATIONAL PHYSICS
ECTS Credits: 6

Physics

Rationale and Purpose of the Module: Physicists at undergraduate level regularly deal with systems that have analytical solutions. However, in many instances analytical solutions are not possible and so these systems require numerical solution. In addition, physicists frequently encounter large data-sets that require analysis that is unfeasible to analyse manually and is beyond the capabilities of a spreadsheet. A physicist should be able to identify these difficulties and implement the appropriate computational methods as necessary.

This module allows students:
- to develop programming skills appropriate to physics.
- to recognise and solve problems from physics that require numerical techniques rather than analytical approaches.
- to develop skills in the application of numerical techniques to physical problems and data analysis.
- to enhance competency in the creation of electronically prepared scientific reports and the associated presentation of data.

Syllabus: [Introduction to computation in physics:] The necessity of numerical techniques in physics; How computers store and manipulate data; storage of numbers and roundoff error; comparison of common programming languages used in physics.

[Introduction to Programming:] Basic syntax and structures in a programming language; functions; file reading/writing; data visualisation.

[Software for writing physics reports:] Mathematical typesetting; Labels and references; citations; including figures and captions.

[Basic numerical techniques:] Root solving; matrix manipulations; curve fitting and interpolation; numerical integration and differentiation.

[Advanced numerical techniques:] Solving ordinary differential equations; solving for eigenvectors and eigenvalues; the fast Fourier transform.

---

PH4007 - SOLAR AND NUCLEAR ENERGY
ECTS Credits: 6

Physics

Solar energy and conversion, solar radiation, net radiation flux at Earth, basic principles of energy conversion. Photovoltaic conversion, solar electricity generation, photovoltaic electric principles, photovoltaic system wiring, batteries, photovoltaic controls. Energy supply systems, simulation of system performance, photovoltaic power production, sizing photovoltaic systems.


---

PH4011 - PHYSICS FOR ENGINEERS 1
ECTS Credits: 6

Physics

Rationale and Purpose of the Module: The module is an introductory physics course covering Mechanics, Heat, Electricity and Magnetism for engineering students.


---

PH4013 - EARTH SCIENCE
ECTS Credits: 6

Physics

The origin of the universe, formation of hydrogen and heavier atoms, formation of rocks and minerals. Quantification of resources: minerals, oil, gas, coal, wind, biomass, marine energy. Theory of Peak Oil and the Hubbert Curve. The Solar System: the Earth's relationship to the Sun, Moon and other bodies of the solar system. Earth, air and water interactions: The structure and composition of the atmosphere. The effects of atmospheric convection, atmospheric dust and cloud.
PH4021 - PHYSICS OF SOLIDS
ECTS Credits: 6

Physics

Rationale and Purpose of the Module: The purpose of the module is to introduce the student to the structure and properties of solid materials. The objectives are to discuss the major classes of solids and their properties and applications, and to present the physical principles needed for an understanding of the observations.


Prerequisites: PH4171, PH4042

PH4041 - OPTICS
ECTS Credits: 6

Physics

Rationale and Purpose of the Module: The aim of this course is to develop and extend the students knowledge of the principles of physical optics and introduce the students to contemporary optics.


Prerequisites: PH4102

PH4051 - MEASUREMENT AND PROPERTIES OF MATTER
ECTS Credits: 6

Physics

Rationale and Purpose of the Module: The purpose of this module is to first introduce fundamental principles of physical measurement and data analysis which are important throughout the course and to introduce the mechanical and thermal properties of solids, liquids and gases.


PH4061 - QUANTUM MECHANICS
ECTS Credits: 6

Physics

Rationale and Purpose of the Module: The purpose of the module is to extend the students understanding of quantum mechanics and to introduce students to...
applications of quantum mechanics in solid state physics.


*Prerequisites:* PH4171, PH4042, PH4132

---

**PH4071 - SEMICONDUCTORS 1**  
**ECTS Credits:** 6  
**Physics**

**Rationale and Purpose of the Module:** The purpose of this module is to introduce students to the fundamentals of semiconductor process technology focusing on silicon technology and integrated circuit processes.

**Syllabus:** Semiconductor technology: overview of advances in integrated circuits, the road map, Moosers law. General nature of semiconductor materials: elemental materials and their uses in research and industry, compound materials and alloys and their applications, influence of purity on electrical properties of semiconductors. Structure of semiconductors: amorphous, crystalline and polycrystalline solids, unit cells, lattice types, body centred cubic, face centred cubic, the diamond lattice, Si and Ge, Miller indices. Electrical properties: contribution of mobility and free carrier density to resistivity, electrical properties of conductors, semiconductors and insulators. Semiconductors: pure semiconductors, important elements from group 3, group 4 and group 5 of the periodic table, valence electrons, covalent bonding, p-type semiconductors and n-type semiconductors, energy levels for p-type and n-type semiconductors, intrinsic, extrinsic, thermal equilibrium, carrier lifetime. Doping of silicon: donors and acceptors, majority carriers and minority carriers, hot point probe, 4-point probe sheet resistance, carrier transport.

- Lithography: lithography processes (light sources, exposure systems, photoresist), aerial image, latent image, relief image, pattern definition, pattern transfer (etching, deposition, implantation etc.). Optical lithography techniques: optical resists, key resist parameters, positive and negative resist, DNQ system and deep UV system.
- Resist processing: priming, spinning, baking, exposing, developing, hard baking, stripping. Exposure: types of exposure (UV light to deep UV, X-rays, electrons, ions), method of exposure, development (positive, negative). Printing: Fresnel system, contact and proximity printing, Fraunhofer system, projection printing, advantages and disadvantages. Advanced lithography: focused ion beam, electron beam, etc.

*Prerequisites:* PH4042, PH4132

---

**PH4081 - NANO TECHNOLOGY 1**  
**ECTS Credits:** 6  
**Physics**

**Rationale and Purpose of the Module:** The aim of this course is to combine basic science of size effect in materials in the micro to nanoscale dimension leading to various cutting-edge applications. The main objective is to introduce the students about the scientific importance and technological potential of developments in micro- and nano structuring of materials.


*Prerequisites:* PH4061, PH4021

---

**PH4091 - PHYSICS OF MODERN MEASUREMENT**  
**ECTS Credits:** 6  
**Physics**

**Rationale and Purpose of the Module:** The purpose of the module is to provide an introduction to the physical principles and applications of advanced surface analytical techniques.

**Syllabus:** Microscopy: image formation, resolution, light microscopy, near-field scanning optical microscopy (NSOM), scanning electron microscopy (SEM), transmission electron microscopy (TEM), scanning transmission electron microscopy (STEM), scanning tunnelling microscopy (STM), scanning force microscopy (SFM). Diffraction and scattering: elastic and inelastic scattering, Braggs law, the reciprocal lattice, Laue equations, x-ray diffraction (XRD), neutron diffraction, selected area electron diffraction in the transmission electron microscope (SAD), electron probe x-ray microanalysis (EPMA), extended x-ray absorption fine structure (EXAFS), extended x-ray absorption fine structure (EXAFS), surface extended x-ray absorption fine structure (SEXAFS/NEXAFS), low-energy electron diffraction (LEED), reflection high-energy electron diffraction (RHEED), particle-induced x-ray emission (PIXE), x-ray fluorescence (XRF). Spectroscopy: vibrational, optical, electronic, magnetic, transition rules, energy-dispersive x-ray spectroscopy in the scanning electron microscope (EDS), electron energy-loss spectroscopy in the transmission electron microscope (EELS), x-ray photoelectron spectroscopy (XPS), selected area electron diffraction in the transmission electron microscope (STEM), scanning force microscopy (STM), scanning tunnelling microscopy (STM), scanning force microscopy (SFM). Diffraction and scattering: elastic and inelastic scattering, Braggs law, the reciprocal lattice, Laue equations, x-ray diffraction (XRD), neutron diffraction, selected area electron diffraction in the transmission electron microscope (SAD), electron probe x-ray microanalysis (EPMA), extended x-ray absorption fine structure (EXAFS), extended x-ray absorption fine structure (EXAFS), surface extended x-ray absorption fine structure (SEXAFS/NEXAFS), low-energy electron diffraction (LEED), reflection high-energy electron diffraction (RHEED), particle-induced x-ray emission (PIXE), x-ray fluorescence (XRF). Spectroscopy: vibrational, optical, electronic, magnetic, transition rules, energy-dispersive x-ray spectroscopy in the scanning electron microscope (EDS), electron energy-loss spectroscopy in the transmission electron microscope (EELS), x-ray photoelectron spectroscopy (XPS),
PH4131 - MECHANICS/HEAT/ELECTRICITY/MAGNETISM
ECTS Credits: 6

Physics

Rationale and Purpose of the Module: This module provides an understanding of the basic concepts of the mechanical, thermal, electrical and magnetic properties of matter, knowledge of which is the foundation of the engineering and technology on which our present society is dependent. The principles covered in this course find application throughout the student’s degree programme. The principles are a key foundation of the degree programme and are extensively developed in theory and practice in the subsequent years of the programme.


Electricity: charge, electric field, Coulomb’s law, Gauss’s law. Electric potential, capacitance, Ohm’s law, Kirchhoffs Laws, dc circuit analysis, Joule heating. RC circuits.

Magnetism: magnetic field, magnetic force and torque, the galvanometer. Ampere’s law. Electromagnetic Induction: inductance. Faraday’s law, Lenz’s law, the generator and motor, back emf.

PH4161 - ATOMIC / MOLECULAR / LASER PHYSICS
ECTS Credits: 6

Physics

Rationale and Purpose of the Module: This module develops the student’s knowledge of atomic and molecular physics, particularly where these are relevant to spectra and laser physics. Based on this the module introduces the fundamentals of laser physics and laser applications including holography.


Prerequisites: PH4132, PH4021

PH4171 - MECHANICS
ECTS Credits: 6

Physics

Rationale and Purpose of the Module: The purpose of this module is to enhance students understanding of key concepts and models associated with classical mechanics, vibrations and waves. The objectives are to develop the mechanics of single particles and of systems of particles including vibrations and waves and rigid bodies, and to introduce Lagrangian and Hamiltonian methods which also provide background for quantum mechanics.


Prerequisites: PH4131

PH4607 - SOLID STATE PHYSICS 1
ECTS Credits: 6

Physics

Rationale and Purpose of the Module: The purpose of this module is to enhance the students’ understanding of key concepts in solid state physics and the quantum theory of solids.


Prerequisites: PH4061

PH4613 - FORCES, POTENTIALS AND FIELDS
ECTS Credits: 6

Physics

Rationale and Purpose of the Module: The purpose of this module is to enhance students understanding of key concepts and models associated with forces, potentials and fields. The objectives are to introduce and model
PHYSICS OF MATERIALS  
ECTS Credits: 6

Physics

Rationale and Purpose of the Module: The purpose of the module is to introduce the student to the structure and properties of solid materials. The objectives are to discuss the major classes of solids and their properties and applications, and to present the physical principles needed for an understanding of the observations.


PHYSICS OF ADVANCED METROLOGY  
ECTS Credits: 6

Physics

Rationale and Purpose of the Module: The purpose of the module is to provide an introduction to the physical principles and applications of advanced surface analytical techniques.

Syllabus: Microscopy: image formation, resolution, light microscopy, near-field scanning optical microscopy (NSOM), scanning electron microscopy (SEM), transmission electron microscopy (TEM), scanning transmission electron microscopy (STEM), scanning tunnelning microscopy (STM), scanning force microscopy (SFM). Diffraction and scattering: elastic and inelastic scattering, Bragg's law, the reciprocal lattice, Laue equations, x-ray diffraction (XRD), neutron diffraction, selected area electron diffraction in the transmission electron microscope (STEM), electron probe x-ray microanalysis (EPMA), extended x-ray absorption fine structure (EXAFS), surface extended x-ray absorption fine structure (SEXAFS/NEXAFS), low-energy electron diffraction (LEED), reflection high-energy electron diffraction (RHEED), particle-induced x-ray emission (PIXE), x-ray fluorescence (XRF). Spectroscopy: vibrations in molecules and solids, selection rules, energy-dispersive x-ray spectroscopy in the scanning electron microscope (EDS), electron energy-loss spectroscopy in the transmission electron microscope (EELS), x-ray photoelectron spectroscopy (XPS), ultraviolet photoelectron spectroscopy (UPS), Auger electron spectroscopy (AES), Fourier transform infrared spectroscopy (FTIR), Raman spectroscopy, nuclear magnetic resonance (NMR), Rutherford backscattering spectroscopy (RBS), secondary ion mass spectroscopy (SIMS), inductively coupled plasma mass spectroscopy (ICPMS), positron annihilation spectroscopy (PAS).

PHYSICS OF ADVANCED METROLOGY  
ECTS Credits: 6

Physics

Rationale and Purpose of the Module: The purpose of this module is to enhance the students' understanding of key concepts in solid state physics and the quantum theory of solids.


PHYSICS OF ADVANCED METROLOGY  
ECTS Credits: 6

Physics

Rationale and Purpose of the Module: The purpose of this course is to apply the basic science of size effects in materials in the micro to nanoscale dimension to various cutting-edge applications. The main objective is to introduce the students to the scientific importance and technological potential of developments in micro- and nano structuring of materials.


**PH5098 - SEMICONDUCTOR PROCESSING 1**

**ECTS Credits:** 6

**Physics**

**Rationale and Purpose of the Module:** The purpose of this module is to introduce students to the fundamentals of semiconductor process technology focusing on silicon technology and integrated circuit processes.

**Syllabus:** Semiconductor technology: overview of advances in integrated circuits, the road map, Moores law. General nature of semiconductor materials: elemental materials and their uses in research and industry, compound materials and alloys and their applications, influence of purity on electrical properties of semiconductors. Structure of semiconductors: amorphous, crystalline and polycrystalline solids, unit cells, lattice types, body centred cubic, face centred cubic, the diamond lattice, Si and Ge, Miller indices. Electrical properties: contribution of mobility and free carrier density to resistivity, electrical properties of conductors, semiconductors and insulators. Semiconductors: pure semiconductors, important elements from group 3, group 4 and group 5 of the periodic table, valence electrons, covalent bonding, p-type semiconductors and n-type semiconductors, energy levels for p-type and n-type semiconductors, intrinsic energy level, intrinsic carrier density, thermal equilibrium, carrier lifetime. Doping of silicon: donors and acceptors, majority carriers and minority carriers, hot point probe, 4-point probe sheet resistance, carrier transport. Lithography: lithography processes (light sources, exposure systems, photore sist), aerial image, latent image, relief image, pattern definition, pattern transfer (etching, deposition, implantation etc.), Optical lithography techniques: optical resists, key resist parameters, positive and negative resist, DNQ system and deep UV system. Resist processing: priming, spinning, baking, exposing, developing, hard baking, stripping. Exposure: types of exposure (UV light to deep UV, X-rays, electrons, ions), method of exposure, development (positive, negative). Printing: Fresnel system, contact and proximity printing, Fraunhofer system, projection printing, advantages and disadvantages. Advanced lithography: focused ion beam, electron beam, etc. Thermal oxidation of silicon: the oxidation process, type of furnaces, wet oxidation, dry oxidation, factors influencing oxidation rates, silica film thickness measurements. Thin film deposition: evaporation, sputtering, chemical vapour deposition. Diffusion: diffusion processes, constant source diffusion, limited source diffusion, solid solubility limits. Epitaxial silicon deposition: LPCVD amorphous silicon, importance of epitaxy. Ion implantation: implantation technology, channelling, lattice damage and annealing.

**PM4013 - PRINCIPLES OF HUMAN RESOURCE MANAGEMENT**

**ECTS Credits:** 6

**Personnel & Employment Relations**

**Rationale and Purpose of the Module:** This module examines both the role of the HR function in the management of people at work and the importance of managing people in contributing to organisational effectiveness. This module is designed to provide students with an appreciation and understanding of Human Resource Management (HRM) in organisations. There is a strong focus on contextualising HRM within the prevailing macro environment, to demonstrate how this influences the range of HR policies and systems enacted by organisations.

The syllabus covers core issues surrounding managing people at work. In so doing, the module starts with a consideration of key labour market issues in Ireland and how these affect the nature of HRM in organisations. Arising from a labour market analysis, core HR activities are next explored including the processes of human resource planning, recruitment and selection. The module then examines critical elements of managing and rewarding performance, designing jobs and developing people at work. The nature of work is set down and finally, the regulatory environment for HRM in Ireland is indicated.

**PM4017 - HUMAN RESOURCE PRACTICE**

**ECTS Credits:** 6

**Personnel & Employment Relations**

**Rationale and Purpose of the Module:** This purpose of this module is to develop practical skills/capabilities considered essential for HR practitioners. These skills are primarily in the key areas of selection, appraisal, discipline and grievance and applying regulations governing HR to all processes and activities. Another core purpose of the module is to increase the knowledge and skill and overall capability of the participants in key operational areas of HR such as performance management, health and safety, employment regulation, employee welfare issues.

**Syllabus:** Overview of key HR processes; key operational areas: selection, performance management conflict, key regulatory considerations; Key communication skills revisited- active listening, questioning styles, recording information; job analysis; recruitment process- designing job descriptions, person specifications, sourcing applicants, interacting with recruitment agencies, application forms; evaluative standards for selection methods: reliability, validity, practicality, integration, interpretability; selection methods: references; selection process- short listing, designing matrices, designing interview assessments, interviewing techniques, applying appropriate communication skills to selection interview; individual characteristics and bias; preparing and setting up interview; regulatory considerations, documentation; performance review- preparation, documentation, conducting the performance review, follow up; workplace counselling; disciplinary interviewing.

**Prerequisites:** PM4013

**PM4027 - SOCIAL PSYCHOLOGY OF...**
ORGANISATIONS
ECTS Credits: 6

**Personnel & Employment Relations**

**Rationale and Purpose of the Module:** This Module seeks to present a broad introduction to social psychology, the scientific study of human social influence and interaction. It provides basic exposure to social psychological issues using the organisation as an operational paradigm for generating understanding and insight. Perspectives from social psychology are drawn upon to examine aspects of contemporary social and organisational life. This module aims to give a critical understanding of current social psychology research and develop a reflective understanding of key organisational developments.

At the end of the module students should have a sound knowledge of research in social psychology in the organisational context and will be expected to be able to apply these ideas, and use them to understand and address relevant social issues.

**Syllabus:** The Nature and History of Social Psychology; Approaches to the Study of Social psychology; Personal and Social Identity in Workplaces; Self-awareness and Self-regulation; Social influence, Conformity, Compliance and Obedience; Helping Behaviours and Organisational Citizenship, Pro-social, Anti-social and Withdrawal Behaviour; The Role of Attribution and Cognitive Dissonance in Organisational Decision-making; Stereotyping and Prejudice in Employment and Workplace Interactions.

**Prerequisites:** PM4022

---

**PM4603 - EMPLOYEE RELATIONS FOR ENGINEERING AND SCIENCE**
ECTS Credits: 6

**Personnel & Employment Relations**

**Rationale and Purpose of the Module:** The module aims to enable students develop knowledge and skills in psychology (both as a discipline and as a professional field) applied to work and organisations. It aims to develop knowledge and skills of understanding individuals in context, considering cognitive, emotional, motivational and behavioural responses to varying working environments and contexts. It aims to develop theoretical and applied knowledge about key psychological concepts and theories concerning, work, the workplace, and working life.

**Syllabus:** 1 Introduction to Work & Organizational Psychology: Psychology as a Science: The art of thinking critically in an applied field
2 Studying Individuals at Work
   - Context & Behaviour
   - Cognition
   - Motivation
   - Emotion
3.Taking an Active Approach to Work
   - Active Behaviour: Adaptive and proactive behaviour
   - Proactive motivation
   - Proactive cognition
   - Actively managing emotions at work
4.Staying Healthy at Work
   - Health Cognitions: Thinking Healthy Emotions: Coping with work stress
   - Behaviour: Fatigue & recovery
   - Motivation: Work engagement
   - Environment: Job Demands & Job Control
5.Staying Positive at Work
   - What is positive psychology?
   - Behaviour: Flourishing
   - Environments conducive to human flourishing
   - Motivation: Psychological Capital
   - Positive Emotions & the ability to savor
   - Cognition: Positive Thinking (mindfulness)
6.Creativity and Innovation at Work
   - Behaviour: Creative and innovative behaviour
   - Cognition: Creative problem solving
   - Motivating employees to be creative: Flow
   - Creative emotions: Broaden & Build

Provide a clear understanding of the legal nature of the contract of employment, and.
Provide an overview of the implications of employment law for the management of the employment relationship. Review the provisions of dismissals, equality, health & safety and other employment legislation.
Allow students to appreciate the role of national and workplace level partnership.

**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.

---

**PO4018 - INTERNATIONAL RELATIONS**
ECTS Credits: 6

**Politics and Public Admin**

**Rationale and Purpose of the Module:** Provides an overview of the principal political institutions, including the presidency, the Oireachtas, the Government, the Taoiseach and the civil service.
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.

---

**PO4023 - COMPARATIVE EUROPEAN POLITICS**  
**ECTS Credits:** 6

**Politics and Public Admin**

**Rationale and Purpose of the Module:** This course provides an introduction to the comparative study of European politics. It provides students with the opportunity to study political trends across Europe, to identify similarities and differences within different countries, systems and regions, and to develop their ability to conduct comparative political analysis.

**NB** This course will mainly draw on Western and Central European political systems.

**Syllabus:** The basic themes of the course are, first, the commonalities and, secondly, the particularities, of politics and government among West European states due largely to their similar yet different trajectories of development, and to the way in which they influence each other. We explore, for example, why politics in some West European countries is very stable, even predictable, whereas in other countries politics is highly fractious; why some countries have single-party governments whilst others are (almost always) governed by complex coalitions; why some polities seem to be well-governed whereas governance seems more haphazard in others. Note, too, that an understanding of politics and government in West European states tells us much about what is involved in building democracy in the new states of Eastern and Central Europe, and indicates some of the difficulties entailed in European integration both of which are areas of study in third-year courses.

---

**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:** PO4011

---

**PO4032 - RUSSIAN POLITICS**  
**ECTS Credits:** 6

**Politics and Public Admin**

**Rationale and Purpose of the Module:** The purpose of this module is to help students explore issues in Russian political development over the last century according to their interests. Students have free choice of which topics they study so that the learning outcomes of the module will be individualized.

In addition to the knowledge gained by students about the USSR and Russia, this module will help students to develop their analytical and research skills. All students, however, will have to search out information on contemporary Russia in their own time and will learn how to locate information in the library and on the WWW, will learn how to judge the merits of different information sources, will learn how to construct arguments from primary materials that they have and how to relate such materials to existing academic literatures. They will also have to learn how to interpret academic literature in changing circumstances, to relate it to a developing polity and judge it against change.

**Syllabus:** This module is a reading course, students consult over and decide in consultation with the lecturer over the topics in Soviet and Russian politics that they study and write on. These topics include may include, but are not limited to:

- Leninism and Bolshevism as political theory
- The 1917 revolution
- The relationship of Leninism and Stalinism
- The development of the Stalinist system
- The great terror
- Khrushchev and destalinisation
- The institutions of the USSR: the party-state system
- Theories of the development of the Soviet system
- The political economy of the USSR
- Soviet foreign policy
- The nature of the USSR (various approaches can be studied including totalitarianism, Marxist approaches etc)
- The Gorbachev reforms
- Why did the USSR collapse?
- Soviet legacies and the post-Soviet policy agenda
- The theory of economic reform and post-Soviet politics
- The post-Soviet struggle for power, 1992-1993
- The presidency under Yeltsin
- Yeltsin, oligarchy and the corruption of the state
- The Putin programme: reform or retrenchment?
- The political economy of the new Russia
- The new Russian political system: Elections
- The new Russian political system: political parties
- The new Russian political system: parliament
- The new Russian political system: the development and dysfunctions of federalism
- Russian foreign policy
- Russia in comparative perspective
- State and democracy in the new Russia

---

**PO4033 - POLITICAL THEORY**  
**ECTS Credits:** 6

**Politics and Public Admin**

**Rationale and Purpose of the Module:** This module will cover the basic concepts in contemporary political theory, building on the ideas introduced in PO4022 Modern European Political Thought. The goal is to develop a clear understanding and mastery of the main concepts and ideas in political theory.
Syllabus: PO4022 Modern European Political Thought introduced students to the basic concepts in political theory via a historical narrative that stressed the richness of political thinking. This module takes the key concepts in contemporary political theory, that were introduced in PO4022, and presents a deeper understanding of their role and relevance in the contemporary world. Concepts covered in the module will include: democratic theory; modern political ideologies; tolerance and multiculturalism; national identity and citizenship and political mortality. Students will be introduced to the different approaches within political theory, as well as how the concepts discussed in this module relate to broader issues within political science.

Prerequisites: PO4011, PO4022

ECTS Credits: 6

------------------------

PO4067 - STUDIES IN POLITICAL THOUGHT

Rationale and Purpose of the Module: To build on the knowledge gained during earlier modules, especially PO4022 Modern European Political Thought, by exploring the writings of a number of key political thinkers in more depth. This module will be an option in the fourth year, and is intended for those interested in exploring political theory themes in more depth. The class will follow a seminar format.

Syllabus: The relationship between political action and political philosophy, with particular reference to questions of freedom and virtue, explored through the thought of Plato, Machiavelli, and Foucault; the political thought of Plato as a foundation for Western philosophy; the politics of Machiavelli and his influence on the development of humanism and republicanism; Michel Foucault and the relationship between truth and power.

Prerequisites: PO4022

ECTS Credits: 6

------------------------

PO4117 - POLICY-MAKING IN THE EUROPEAN UNION

Rationale and Purpose of the Module: The module is being created as an addition to the elective choice for students in semesters 7 and 8 on BA Politics and International Relations and on AHSS programmes where Politics is offered as an option.

It better reflects the subject expertise of current teaching staff in this area than existing modules.

Syllabus: This module takes a detailed look at the policy-making process of the EU. Few EU policies directly redistribute money, yet even if they sometimes seem to focus on rather arcane technical issues, they often have profound consequences for the legal rights and the welfare of individual citizens, the competitiveness of particular companies or entire industries, and the social, economic, and democratic development of Europe as a whole. If we want to evaluate the functioning of the EU as a democratic political system, we need to know who is involved in the formulation and implementation of those policies, to what extent these actors and the structural characteristics of the process influence the shape and content of those policies, and why different actors and structural characteristics vary in their influence on policy outcomes. These are the types of questions discussed in this module.

Module outline:
- Introduction and historical background
- The institutional framework
- Policies and policy-making
- Theories of European integration and policy-making
- Agenda-setting
- EP decision-making
- Council decision-making
- Bicameral bargaining
- Transposition and implementation
- Enforcement and judicial review
- Evaluation

ECTS Credits: 6

------------------------

PO4127 - REGIONALISM IN WORLD POLITICS

Rationale and Purpose of the Module: The proposed module better reflects the subject expertise of current teaching staff in this area and curriculum in the BA Politics and International Relations.

It will be scheduled in place of the existing module PL4017 'Regional Development' as a core second year module for BA Politics and International Relations. The module will be added to the elective choice for students in semesters 7 and 8 on AHSS programmes where Politics is offered as an option.

Syllabus: Week 1: What is Regionalism? How does it facilitate development?
Week 2: New and Old Regionalism: Regionalism and Globalisation
Week 3: Regionalism in Action: Types, Comparisons and Functions
Week 4: The European Union
Week 5: American Regionalism
Week 6: ASEAN and APEC
Week 7: South Asian Regionalism (SAARC)
Week 8: Africa and the African Union
Week 9: Regionalism and the UN
Week 10: Case Study I: European Regional Enlargement
Week 11: Case Study II: South Asian Security
Week 12: Gendered approaches to regionalism and development

ECTS Credits: 6

------------------------

PO4107 - NATIONALISM, ETHNICITY AND CONFLICT

Rationale and Purpose of the Module: In this module students will address debates about the causes and nature of nationalist politics and ethnic conflicts. They will explore the ways in which historians and political scientists have sought to explain the capacity for national movements and ethnic identities to mobilise and unite people who may among themselves have sharply contrasting objective interests. A key aim of this module is to enable you to take general theories - in this case those that explain nationalism and ethnicities and to use them critically, testing their validity, and if necessary, introducing your own modifications and qualifications to these theoretical generalizations.

Syllabus: Introductory: What is a nation?
- Nations, nationalism and modernity.
- Pre-modern nations.
- Case study: Irish nationalism
- Case Study: South Africa: Afrikaner and African nationalism
- Case Study: Slovak Nationalism
- Ethnicity and ethnic conflicts: An introduction
- Ethno-nationalist movements and political violence
- Ethnic conflicts and peace processes
- Gender, nationalism and ethnic conflicts
- Case studies: Sri Lanka, Kashmir
- Case Studies: Northern Ireland, Former Yugoslavia
Syllabus:

Clinical Therapies

Rationale and Purpose of the Module: This module is designed to enable students to understand the structure and function of the musculoskeletal system of the lower extremity, pelvis and spine; abdomen; the cardiovascular system and the respiratory system. This module forms the basis for understanding the implications of pathophysiological changes within these structures that will be studied in modules during years 2-4.

The total hours scheduled will be 96 (based on 3 hours lectures, 3 hours labs and 2 hours tutorials over 12 weeks)

Syllabus: Introduction to nomenclature and general concepts of anatomy, classification of bones, joints and muscles; cervical, thoracic and lumbar spine and thorax (sternum, ribs and thoracic vertebrae). The integumentary system (structure & function), Afferent and efferent control of muscle tone and posture; myotomes and dermatomes and reflexes LL; pelvic bones and pelvic floor and perineum ; bony skeleton, muscle attachments, joints, nerve supply of the lower limb, analysis of movements of the lower limb, muscle participation and nature of contraction

---

PS4011 - SOCIAL PSYCHOLOGY 1
ECTS Credits: 6

Psychology

Rationale and Purpose of the Module: To provide a broad introduction to the field of social psychology which will be built on in future modules. The lectures will provide a framework around a range of topics in social psychology.

Syllabus: Social psychology is a field of psychology that considers the nature, causes, and consequences of human social behavior. The module will cover theories, models, key concepts and issues related to attitudes and behaviour, social influence, intra and inter group processes, pro-social behaviour, and affiliation, attraction and love.

---

PS4021 - PSYCHOLOGY: THEORY AND METHOD 1
ECTS Credits: 6

Psychology

Rationale and Purpose of the Module: This module provides students with a broad introduction to the historical evolution, issues, debates, themes and theories in psychology. The course will provide a good grounding in a range of theoretical perspectives in psychology including attention in particular to personality and biological psychology.

Syllabus: This module is the first of two modules which provide a broad introduction to the discipline of psychology. This module will begin with a brief historical and philosophical overview of the roots of psychology and then move on to cover the psychodynamic perspective, behaviourism and learning theory, the biological basis of behaviour, and cognitive psychology. Within the biological perspective the focus will be on motivation and emotion, and within cognitive psychology the focus will be on memory.

---

PS4022 - PSYCHOLOGY OF THE PERSONALITY
ECTS Credits: 6

Psychology

Rationale and Purpose of the Module: For students to understand how the field of psychology has approached the topic of personality and for students to develop knowledge of the ways personality and individual difference, intelligence and aptitude are constructed and tested in psychology.

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

---

PS4027 - APPLIED PSYCHOLOGY
ECTS Credits: 6

Psychology

Rationale and Purpose of the Module: For students to develop an understanding of how psychology is applied in practice

Syllabus: To examine how major theories and core areas of psychology can be applied in professional practice

Prerequisites: PS4042, PS4021

---

PS4031 - PSYCHOLOGY AND EVERYDAY LIFE
ECTS Credits: 6

Psychology

Rationale and Purpose of the Module: To introduce students to the range of areas in which professional psychologists work

Syllabus: Through exploring some key studies in psychology, students will gain a basic understanding of the main investigative techniques used by psychologists. The range of topics will include; definitions of psychology; communication and body language; personality; sex and gender; social interaction; emotion; brain and behaviour; health and illness; human development; psychological problems; perception and thinking; learning; humans and animals; applications of psychology

Prerequisites: PS4032, PS4031

---

PS4035 - BIOLOGICAL BASIS OF HUMAN
PS4041 - PRACTICAL PSYCHOLOGY 1
ECTS Credits: 6

Psychology

Rationale and Purpose of the Module:
To introduce students to the range of research methods employed in psychology and to develop students' ability to work with quantitative data and SPSS in particular.

Syllabus: This practical class introduces the range of methods employed in psychology to students. The value of experiments, observational, survey and interviews and case studies work are considered using illustrative examples. Practical skills in these methods are developed though the use of selected examples. Students are also introduced to important IT skills such as library search skills and SPSS for coding of data via practical work.

Prerequisites: PS4021

PS4045 - ADVANCED RESEARCH METHODS
ECTS Credits: 6

Psychology

Rationale and Purpose of the Module: Extend students knowledge of the academic discipline of psychology through extending range of design and analysis skills and examining the fundamental assumptions of psychological research and practice.

Syllabus: Advanced statistical techniques for survey and experimental research such as regression, multivariate ANOVA and categorical data analysis. Qualitative methods and in particular key concepts from critical psychological perspective.

Prerequisites: PS4033, PS4042, PS4021

PS4901 - EMPIRICAL PSYCHOLOGY
ECTS Credits: 6

Psychology

Rationale and Purpose of the Module: The purpose of this research methods module is to familiarise students with a range of laboratory-based activities and psychometric testing in psychology and to develop students' ability to design, collect, code and analyse empirical data using experimental methodologies and psychometrics testing. This module is designed to give students and in-depth understanding of the rationale of the procedures, to develop students critical reflection on these procedures and to develop students independent research skills.

Syllabus: This module primarily covers experimental research methods and psychological testing methodologies to assess behaviour, mental processes and personality characteristics. The laboratory part of the module introduces students to a range of laboratory-based activities in psychology and to develop students' ability to design, collect, code and analyse empirical data using experimental methodologies.

Prerequisites: PS4042, PS4021

PS4138 - HEALTH PSYCHOLOGY
ECTS Credits: 6

Psychology

Rationale and Purpose of the Module: to introduce students to the rapidly developing field of health psychology, to highlight the importance of a biopsychosocial approach to understanding health and illness, and to improve students understanding of the role that behaviour plays in determining health and illness.

Prerequisites: PS4042, PS4021
PS6041 - ADVANCED RESEARCH DESIGNS IN PSYCHOLOGY
ECTS Credits: 6

Psychology

Rationale and Purpose of the Module: The purpose of this module is to increase students' knowledge and understanding of advanced research designs and how they can be developed for both experimental and non-experimental psychological 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 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.

PS6051 - ADVANCED ANALYSIS IN PSYCHOLOGY 1
ECTS Credits: 6

Psychology

Rationale and Purpose of the Module: Psychology makes use of many different advanced statistical methods. This module is the first part of a two-part module sequence on advanced methods of analysis in psychology. The goals of this module are to teach students the principles of advanced statistical techniques and the proper uses of these techniques to test research hypotheses. This module will empower students by instilling them with confidence that they can independently use these data analytic techniques.

Syllabus: Researchers in psychology need to decide which statistical method is most appropriate to a given research question or a particular data set. In order to make these decisions, researchers must understand the basic principles that underlie statistical analyses and have the skills to weigh the advantages and disadvantages of one technique over another. Two modules will examine the underlying principles, strengths and limitations of a range of statistical methods. The modules provide intensive instruction in the use of statistical analyses commonly used in psychology. The statistical techniques taught in this module, the first of a two-part module sequence, include multiple regression, canonical correlation, analysis of covariance, multivariate analysis of variance and covariance, repeated measures analysis, profile analysis, and logistic regression. Besides understanding the principles, benefits and limitations of these statistical methods, students will also learn how to use these methods with computer software.

PS6061 - PROFESSIONAL SKILLS IN PSYCHOLOGY 1
ECTS Credits: 6

Psychology

Syllabus: This course is the second part of a two-course sequence on professional skills. In order to successfully communicate research, students need to train their writing skills. In this module, students want to improve students writing skills by means of giving good examples for writing styles and by giving students feedback on their writing skills. Consistent with the purpose of the module, it is intensive in writing.

PS6071 - SOCIAL INFLUENCE AND ATTITUDE CHANGE
ECTS Credits: 6

Psychology

Rationale and Purpose of the Module: The aim of this module is to give an overview to social influence and attitude change processes. An emphasis is given to the applicability of social influence and attitude change strategies to specific social contexts (e.g., advertisement, work environment, interpersonal, and inter-group relationships).

Syllabus: Social influence and attitude change are two core issues in psychology. Human interactions involve different forms of social influence and changes in attitudes. In this module we will examine basic cognitive and affective levels as well as the more social levels (e.g., groups) which determine social influence and attitude change. We will review important, representative contributions to social influence and attitude change. We will provide a historical perspective on the development of theories and paradigms in these areas of research. In addition, we will discuss with students whether and how the prominent theories on social influence and attitude change can be applied to everyday life situations.

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.

PS6091 - CLINICAL MODELS OF PSYCHOLOGICAL DISORDERS
ECTS Credits: 6

Psychology

Rationale and Purpose of the Module: Clinical
psychology is the study of psychological disorders and distress. The aim of this module is to give an understanding of psychological disorders and distress, and how their occurrence and persistence can be explained with prominent clinical models of disorders.

Syllabus: The module will provide a valuable introduction to key issues and concepts in clinical psychology. Students will be introduced to prominent psychological disorders (e.g., anxieties, dissociative and somatoform disorders, mood disorders, schizophrenia, personality disorders). The module will also focus on historical and recent approaches that explain the development and the persistence of these disorders. These perspectives will include, for example, psychodynamic, behavioural, cognitive, and systemic approaches. The validity of these clinical models will be discussed by considering up-to-date research in clinical psychology. The lecture series will provide overviews to the topics and the tutorials will allow for in-depth discussions of clinical models of psychological disorders in class.

PT4005 - SUPPLY CHAIN DESIGN
ECTS Credits: 6

School of Engineering


PT4007 - PLAN WITH SUPPLY CHAINS
ECTS Credits: 6

School of Engineering
Rationale and Purpose of the Module: This module is part of a stream.

The centrality of planning activity is established in the context of the Supply-Chain Operations Reference Model (SCOR).

Planning incorporates anticipation represented here by Forecasting and making optimal decisions about capacity of supply, storage, production, delivery and enabling processes, and about how to integrate and deploy this capacity optimally in terms of performance and cost trade-offs within the confines of limited resources.

Syllabus: Demand and Order Management: Role of demand management in supply chain planning, Forecasting, Fundamentals of sales and operational planning. Capacity Planning and Utilization: Role of capacity planning, Capacity planning techniques, Scheduling capacity and materials. Production and Inventory Management: Master Production Scheduling (MPS) techniques, Bill of material structuring for MPS, Production Activity Control (PAC), Inventory management concepts, Inventory related costs, Multi-item management. Distribution Requirements Planning: Distribution Requirements Planning (DRP) in the supply chain, Available to Promise, Allocated Available to Promise. Planning in Source, Deliver and Product Returns: Source requirements, Deliver requirements, Product return requirements, Reverse logistics. Planning Systems: Enterprise Resource Planning (ERP), Performance measures for system effectiveness, Material Requirements Planning (MRP) techniques, Advanced Planning and Optimisation tools and techniques, Solving planning problems with Linear Programming: Planning problems requiring LP, Example LP models, Modelling and solving LP models in a spreadsheet, The purpose of and approaches to sensitivity analysis of LP Models.

PT4011 - INTRODUCTION TO TECHNOLOGY MANAGEMENT
ECTS Credits: 6

School of Engineering
Rationale and Purpose of the Module: The purpose of this module is to introduce students to the concept of Technology Management and in doing so to provide them with an understanding of what they will be studying during their 4-year degree and why it is relevant. This
module will provide students with a framework for understanding technology management activities and tools. The module will examine how firms acquire, exploit and protect technology resources. Students will be introduced to a set of tools that can be used in managing technology. Many of the concepts introduced in this module will be explored in greater detail in future modules.

**Syllabus:** Technology Strategy: Integrating technology and strategy, design and evolution of technology strategy, acquiring and selecting new technologies, technological competencies and capabilities. Technology Forecasting and Road Mapping: Technology S-curves, patterns of innovation, Forecasting techniques: Scenario analysis, EMV, Decision Trees, Technology Trajectories Technology Development: new product development, stage gate processes, market research methods, prototyping Incremental vs. disruptive development, technology transfer, Technology Portfolio Planning: Value Analysis/Value Innovation, Life-cycle models, Patent technology transfer, Technology Portfolio Planning.

**Rationale and Purpose of the Module:**

To provide students with modeling and software capabilities to apply simulation to manufacturing, logistic and services systems. To provide students with knowledge on discrete event simulation modeling and its application to manufacturing, logistic and services systems. To provide students with understanding of design and analysis of operations under uncertainty.

**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.

**PT4025 - SIMULATION MODELLING AND ANALYSIS**

**ECTS Credits:** 6

**School of Engineering**

**Rationale and Purpose of the Module:** To provide students with knowledge on discrete event simulation modeling and its application 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.

**PT4015 - LEAN THINKING AND LEAN TOOLS**

**ECTS Credits:** 6

**School of Engineering**

**Rationale and Purpose of the Module:** To introduce the main elements of the Lean process improvement framework, focusing on quantity control and human engagement, through lectures, readings and laboratory experience.

**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, Littles law, flow factor. Systematic Layout Planning, layout design and improvement. Inventory control, classical economic order quantity, safety stocks, batch size and consequences: Littles law, flow factor and variability effects. Push planning (MRP/CRP/MRP). 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.

**PT4037 - INNOVATION AND TECHNOLOGY MANAGEMENT**

**ECTS Credits:** 6
School of Engineering

Rationale and Purpose of the Module: To provide students with an understanding of the role of technology and innovation within industrial organisations and with the ability to manage technology as a resource within products, services and processes.

Syllabus: Business opportunities and strategies, product and technology strategies, planning, support and finance for technology based businesses, product lifecycles costs, cost estimating. Innovation Management, types of innovation, the innovation process, successful innovation. Innovation Management, types of and technology strategies, planning, support and finance.

Sources of technology, technology transfer, strategic planning, product platforms, product specifications. Concept generation, selection and testing, product forecasting techniques, technology trajectories, product specifications. New product and service ideas, needs, translating customer needs into product and technologies, identifying and interpreting customer needs, translating customer needs into product specifications. New product and service ideas, forecasting techniques, technology trajectories, product concept generation, selection and testing, product planning, product platforms, product specifications. Sources of technology, technology transfer, strategic alliances, the management of patents and intellectual property, Research & Development management, Success Factors, Product Development Process, the use of Prototypes, Product Development Organisation, product commercialisation and launch. Managing technical projects, project definition, planning and execution.

---

PT4047 - MEASUREMENT AND QUALITY SYSTEMS
ECTS Credits: 6

School of Engineering

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


---

PT4111 - MANUFACTURING TECHNOLOGY 1
ECTS Credits: 6

School of Engineering

Rationale and Purpose of the Module: To provide the student with a basic knowledge and experience the properties of engineering materials are how they are processed and fabricated.

To emphasise the importance of safety in the engineering environment.

To provide the student with the knowledge to select an appropriate material for the manufacture of an engineering component or structure.


---

PT4121 - COMMUNICATION GRAPHICS
ECTS Credits: 6

School of Engineering

Rationale and Purpose of the Module: This module provides an introduction to the fundamentals of the universal language of engineering, design and technology. The essential conventions, principles and concepts of the graphic language are explored through visualisation and solving problems using a combination of freehand sketching and manual drawing communication techniques. The visualisation and graphic skills developed are essential prerequisites for 2D and 3D CAD.

To promote and nurture spatial-visualisation and spatial-reasoning abilities critical to the success of technology professionals.

To present the standards and conventions of engineering drawing essential to the correct creation and interpretation of graphical representation used in engineering communication and documentation.

To foster manual drawing skills, especially sketching, which are essential to design and communication success.


---

PT4213 - DRAWING AND CAD
ECTS Credits: 6

School of Engineering

Rationale and Purpose of the Module: To introduce the students to the standards, conventions and projection systems used to communicate design information.

To develop the students technical communication abilities.

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

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


**PT4423 - 2D CAD**  
ECTS Credits: 6

**School of Engineering**

**Rationale and Purpose of the Module:** 2D CAD drawings are vital to the communication of engineering design information. 2D CAD generated drawings are used in such diverse areas as architectural design, mechanical part design, facilities layout, service and circuit diagrams and technical publications. This module introduces students to the concepts, principles and techniques of 2D CAD drawing and design using AutoCAD. The adoption of best practice strategies for the efficient and effective use of CAD for creating, editing and viewing geometry as part of the design process are stressed throughout the module.

**Syllabus:** Contemporary CAD software with particular reference to AutoCAD; hardware, software and operating systems; the AutoCAD drawing environment: absolute and relative coordinates, units and limits; CAD tools and drawing setup; drawing templates; the UCS; basic and advanced drawing and editing commands; introduction to layers; creating and using blocks Wblocks, attributes and symbol libraries; communicating engineering and design details; dimensioning and dimensioning styles; text styles; tolerated dimensioning; sectional views and hatching; tool palettes; Paper Space layouts; customisation techniques; customising toolbars and toolbar macros; isometric drawing. CAD construction techniques; plotting; sheet sets; raster images, multilines; using DesignCenter; DWF drawings; Introduction to 3D geometry.

**Prerequisites:** PT4121

**PT4427 - DESIGN FOR MANUFACTURE**  
ECTS Credits: 6

**School of Engineering**

**Rationale and Purpose of the Module:** To introduce the student to the science and art of New Product Development. It links the manufacturing and construction skills learnt in earlier modules with the design process and these are brought together by means of a project. The project is intended to take the student through the basic design process into requirements engineering, market analysis, materials, manufacturing processes and the production of an initial business plan.


**PT4617 - RELIABILITY TECHNOLOGY**  
ECTS Credits: 6

**School of Engineering**

**Rationale and Purpose of the Module:** To give students an understanding of the principles of reliability evaluation and the influence on maintenance strategies, costs and replacement decisions. To equip students with abilities to perform environmental audits on products and processes. To present environmental impact assessment and ecological footprinting of products and processes used in the critical realisation of current unsustainable engineering trends.

&bull; have knowledge of current national curricula/syllabi in the relevant sector and an awareness of curriculum requirements in preceding and subsequent stages of learning,
&bull; understand the subject matter, pedagogical content and related methodology of the relevant curriculum/syllabi and guidelines, and
&bull; be able to think critically, analyse and solve problems, as an individual and a member of a team.

The concepts and skills associated with outdoor and adventure uniquely address each of these skill sets. As such, this module is designed to prepare preservice teachers to organise, teach, and facilitate outdoor and adventure education in Irish physical education.

Specific purposes are to:
1) enhance students’ capabilities teaching outdoor and adventure to post primary students;
2) draw links between the current national curriculum/syllabi regarding outdoor education and selected curricular and instructional models;
3) recognize the potential of non-sport related activity in the lives of post primary students; and
4) gain understanding of the conduct of off-site teaching.

Syllabus: Through the acquisition of adventure and outdoor skills and knowledges, the pedagogy in teaching outdoor and adventure education and selected curricular models will be examined. Adventure principles include full value contract, experiential learning cycle, challenge by choice, briefing, processing and facilitating an experience, the determination of physical and emotional risk, and safety. Outdoor activities may include: orienteering, hill walking, camp craft, exploring nature, leave no trace, canoeing, rock climbing. Pedagogical skills involve big picture goals and assessment, aligned learning outcomes, content progression, and assessment, focused reflection on student learning linked to teacher action.

PY4081 - PEDAGOGY OF INVASION GAMES
ECTS Credits: 6

Physical Education & Sport Sciences

Rationale and Purpose of the Module: The rationale of this module is to allow students to become familiar with a selection of invasion games, ones in which skills and tactics can easily be identified and practiced, and where minimal equipment is required. The purpose of the module is twofold: 1.) for students to be able to understand the tactical approaches, appropriate skills, and safety considerations necessary when engaging in invasion games and 2.) to provide students with the pedagogy skills needed to teach invasion games within a post-primary setting. The module will be taught through particular curriculum model, for example TGFU. The students will live the curriculum model in order to understand the structure of the model and how it can be taught within a post primary setting.

The module will focus on principles of play and tactics within invasion games. Therefore links will be made across all invasion games so students can see the correlation and common tactics involved in each.

Syllabus: The purpose of this module is for students to become familiar with simple invasion games and, in particular, how these games are presented in the Junior Cycle, junior cycle short course, Senior Cycle, and Leaving Certificate physical education curricula. Students will experience and analyse many invasion games, for example Gaelic Football, Hurling, Soccer, Hockey, Rugby and Basketball, focusing on the following areas: common principles of play, tactical awareness, rules and skill acquisition; how to introduce activities and progressions; and safety considerations specific to all the games. The module will be taught through a curriculum model, for example: TGFU. TGFU will aid the principles of play and tactical focus of the module.

PY4122 - GAELIC GAMES
ECTS Credits: 6

Physical Education & Sport Sciences

Rationale and Purpose of the Module: This module is designed to give an introduction to Gaelic games from a practical and cultural perspective. It will offer an introduction to the history of the Gaelic Athletic Association (GAA) and the development of the association from its foundations in 1884 through to the present day. The module will also introduce students to Hurling, Camogie and Gaelic Football specifically through participation in ‘Gaelic Games related’ learning activities as well as practical labs. Emphasis will be placed on developing knowledge and basic competency with respect to the core skills of these games and principles of play (e.g. defending and attacking). Students will become aware of how to provide a safe environment and ensure personal safety as well as that of others in Gaelic Games activities. Understanding the rules and regulations of each game will also be developed through the practical labs. Basic coaching skills will also be introduced.

Syllabus: Foundations of the GAA; Development of the GAA (1884-2016): Key strategies, programmes, policies and initiatives (1884-2016) (e.g. Go-games Initiative, Grassroots to National Programme); Gaelic Games Associations (e.g. Gaelic Players Association, Ladies Gaelic Football Association); Gaelic Games Worldwide. Introduction to the core skills of Hurling, Camogie and Gaelic Football; Common principles of play; Structures, rules and regulations; Skill development, including fundamental movement and basic motor skills; Warm-up and cool-down; Games vs drills; Basic tactics; Introducing activities and progressions including modified and full-sided games; Safety aspects (environmental, personal and player safety); Coaching styles and methods; Planning practical sessions for different ability groups; Developing communication and organisations skills in practical environments; Player and self-evaluation in a practical context.

PY4123 - INSTRUCTIONAL ALIGNMENT IN PHYSICAL EDUCATION
ECTS Credits: 9

Physical Education & Sport Sciences

Rationale and Purpose of the Module: The rationale of this module is for students to be introduced to instructional alignment in physical education, i.e., when outcomes, activities, instruction and assessment of a physical education programme are matched and compatible. Students will become familiar with and be able to critically comment on the central topics of curriculum, assessment, and teaching and learning, within the (Irish) post-primary physical education context; thus, informing what they believe is worth learning and assessing within physical education. Students will be directed to address these central topics in their preparation of schemes of work and lesson plans for year 2 school placement.

The purpose is threefold:
1) To allow students to become familiar with various ways of looking at curricula which encourage critical monitoring and evaluation of the (Irish) post-primary physical education curriculum.
2) To acquaint pre-service teachers with how learning by individual pupils can be facilitated through the provision...
of appropriate environmental factors (e.g., safety, facilities, equipment, and teacher information) and the setting of tasks (through instructional and teaching strategies) suitable to individual learners. It will introduce pre-service teachers to ideas on how to design challenging learning experiences for students, select applicable teaching strategies to facilitate student learning, and modify/adapt these to accommodate student learning.

3) To introduce the concepts of assessment of learning and assessment for learning and their potential to document student learning in a physical education environment.

Syllabus: This module provides an opportunity to understand instructional, curricular, and assessment concepts related to effective teaching and learning in physical education. Course content will examine various teaching strategies and instructional formats, physical education curricular models, and formative and summative assessment strategies. In addition, the extent to which personal orientations and philosophies impact instruction, curriculum, and assessment will be investigated. Further topics include an understanding the physical education curriculum within the (Irish) school system and what is worth learning. Students will be directed toward aligning their belief systems with the use of particular curriculum/instruction models.

Understanding assessment and its relationship to learning goals and learning experiences will allow students to determine what is worth assessing and how this can be done in a meaningful, relevant, and effective way. The preparation of schemes of work and lesson plans for year 2 school placement will be a consistent focus of the module.

PY4133 - PEDAGOGY OF DANCE AND GYMNASTICS
ECTS Credits: 6

Physical Education & Sport Sciences

Rationale and Purpose of the Module: The purpose of this module is to prepare students to teach the fundamentals of Dance and Gymnastics in a post-primary context; to provide safe, inclusive and educationally meaningful experiences for post-primary students in the Dance and Gymnastics. Students will be introduced to Junior cycle requirements for both strands, develop their knowledge and understanding of the key pedagogical principles of both through critically examining the Physical Education curriculum and the frameworks for the relevant Junior Cycle short course. Students will learn about relevant bodily techniques, skill development, aesthetic appreciation, creative composition, using basic gymnastics equipment and the transferability of learning in Dance and Gymnastics across the post primary curriculum. A range of strategies for teaching, learning and assessment will be introduced and through Dance and Gymnastics will be introduced and practiced. The key instructional strategy will focus on but not be limited to the Inquiry Model. To give focus to the module learning outcomes and module content this module will be framed around selected Curriculum Models for example Sport Education. This will help frame the content of the module and by focusing teaching and learning experiences on a more complete and authentic level in these two Physical Education strands students will be provided with a map for decision making about teaching and learning in Dance and Gymnastics.

Syllabus: At the centre of this module syllabus will be the introduction to the Junior and Senior Cycle Frameworks for Physical Education and JCPE short courses. Attention will be paid to Wellbeing as well as aesthetic education through meaningful movement experiences along with the Junior Cycle Statements of Learning and Teaching. There will be an introduction the Laban’s Movement Analysis as a tool for developing observation for physical literacy, Curriculum Models, inclusive teaching and learning practices, resources for teaching Dance and Gymnastics, assessment of and for Dance and Gymnastics, lesson planning (warm ups, task-based activities, lesson development and closure) and schemes of work design with specific reference to curriculum alignment. Students will be introduced to basic equipment and apparatus and as a consequence also be introduced to safe practice in Gymnastics.

PY4135 - ADAPTED PHYSICAL ACTIVITY AND PHYSICAL EDUCATION
ECTS Credits: 3

Physical Education & Sport Sciences

Rationale and Purpose of the Module: Integration and inclusion of all individuals into school structures and curriculum provision is an essential feature of physical education teaching. Catering for individuals with varying levels of ability from limited to a high level requires knowledge of appropriate pedagogical principles and an ability to situate the needs of the individual on a whole school and classroom basis. Empowerment and entitlement are key concepts within this module.

The purpose of this module is threefold:
1) To critically evaluate the attitudes and beliefs about teaching and learning which inform and guide his/her professional practice.
2) To act as an advocate on behalf of learners, referring students to specialised educational support as required and participating in the provision of that support, as appropriate.
3) To identify cross-curricular links and themes including citizenship; creativity; inclusion and diversity; initiative and entrepreneurship; personal, social and health education; and ICT, as appropriate to the sector and stage of education, and how these are related to life experiences.

Syllabus: This module is designed to provide students with an introduction to adapted physical activity with a focus on physical and motor characteristics of persons with disabilities as they relate to programming in physical education. The course will focus on past and present research regarding motor/physical development, assessment, and programming for individuals with cognitive, sensory, physical and health impairments. Students will be able to identify and understand how the placement of children with disabilities and the efforts it takes to promote more inclusive physical education programmes.
Critical features of performance in a wide range of sport and exercise activities. It encourages students to examine qualitatively, the effects of forces on joint function. The module is also a preparation for the more detailed quantitative approaches and presents a structured approach for analysing skills and identifying critical coaching and teaching points.

**Syllabus:** Forms of motion; translation rotation and general motion. Effects of forces. Momentum and impulse. Qualitative analysis - deterministic models and their applications in human movement; projectile based motions in sport: Jumping and throwing, striking activities etc. Cyclical movement patterns : Running, walking. Centre of gravity, line of gravity. Mechanical determinants of balance equilibrium and stability. static and dynamic posture. Analysis of balance related situations. Angular motion of body free of support - axis of rotation, torque and angular impulse, moment of inertia applications to sports situations Motor Development and qualitative kinematic analysis

---

**PY4155 - PEDAGOGY OF AQUATICS / ATHLETICS**  
**Physical Education & Sport Sciences**  
ECTS Credits: 6

**Rationale and Purpose of the Module:** This module introduces students to two strands that are focused on individual performance; Aquatics and Athletics. Students will learn how to plan both Aquatics and Athletics lessons which are safe, enjoyable, inclusive and educationally meaningful. Furthermore, established links will be made between the two respective activities and bio-mechanics particularly in the context of contemporary Irish Physical Education. Both strands provides opportunities for "the personal, physical, and social development of each student in a safe, enjoyable environment" (JCPE, 2003; 19). It will be emphasized how important adaptations and modifications are within a physical education class, whether it be "modified forms of standard events" or "combinations/adaptations" or recognized strokes. The module will be taught through particular curriculum model, for example HRA. The students will live the curriculum model in order to understand the structure of the model and how it can be taught within a post primary setting.

**Syllabus:** Aquatics: the focus will be on learning the fundamentals of swimming; buoyancy, propulsion and streamlining. Being aware of the effects of being in water on balance, propulsion and resistance will be introduced.

Observing the differences in buoyancy between individuals and various depths in the pool will also be observed. Understanding and demonstrating the importance of safe water entries will be emphasized. Performance and analysis of various strokes/modifications of strokes, e.g. front crawl, back crawl and breast stroke will be taught. Understanding the benefits of and participating in exercise in the water will be taught to the students. Demonstrating the ability to perform various water safety skills and survival skills will be an important skill for the students to learn. A brief introduction to water polo will be introduced. Athletics: An overview of athletics from a variety of perspectives (bio-mechanical, physiological, educational) will be given to the students. Athletics within post primary schools will be explored; limitations and possibilities, athletics lessons, planning for mixed ability and the logistics of running a school athletics event. The fundamentals of running, jumping and throwing will be emphasized, progressing to basic, event specific technique in traditional track & field athletics events (e.g. sprints, hurdles, Long Jump, High Jump, Shot, Discus etc.). Students will be involved in "athletics related activities" (indoors & out). There will be a focus on the teaching of athletics within a post primary school setting.

---

**RM4001 - RESEARCH METHODS IN LANGUAGES, LITERATURE AND CULTURAL STUDIES 1**  
**School of Culture and Communication**  
ECTS Credits: 6

**Rationale and Purpose of the Module:** This module introduces students to research methods in languages, literature and cultural studies, covering the main areas of these disciplines, their methods of inquiry, and their key concepts and problems. The module provides training in essential research skills, equipping participants to pursue self-directed study, to individually select a research topic and develop appropriate research questions, to identify the appropriate tools and methods of research to carry out this project, and write a research proposal. The aims of the module are:

- To introduce students to research methods in languages, literature and cultural studies;
- To equip students with the necessary skills to select a research topic, develop a research question(s) and write a research proposal;
- To introduce students to the research skills required for sourcing, storing and presenting research data;
- To develop an awareness of the information technology skills necessary to develop the above research skills.

**Syllabus:** Intended as an introductory course for students undertaking research in languages, literature and cultural studies, students will be introduced to the quantitative and qualitative methods employed in each of these disciplines. Incorporating a practice-based element, students will be equipped with the necessary skills to select a research topic, develop a research question, identify the appropriate methods to carry out this research project, and write a research proposal. Students will also be introduced to the skills needed to source and present language, literary and cultural data, in particular the information technology skills necessary for analysing online data such as collections of literary texts and linguistic corpora.

---

**SO4001 - INTRODUCTION TO SOCIOLOGY**  
ECTS Credits: 6

**Sociology**

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

**Syllabus:** An introduction to the sociological perspective  
What is sociology and what do sociologists do?  
The development of sociology  
The sociological imagination  
An introduction to sociological theory  
Agency and Structure  
Culture, Norms and Values  
An introduction to structural functionalist theories  
An introduction to conflict theories  
An introduction to interaction theories  
An introduction to feminist theory and post-modernism  
An introduction to sociological research  
The ethics of social research

---

**SO4033 - SOCIOLOGY OF MEDIA**  
ECTS Credits: 6

**Sociology**

**Rationale and Purpose of the Module:** This 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
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, G-localization and Media Audiences.
  * Media Ownership, concentration and conglomeration.
  * The political economy perspective. The public sphere.
  * Media production and media professionals.
  * Structure and agency in a media setting.
  * Halls encoding/decoding model.
  * Rhetoric, 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.

SO4047 - SOCIOLOGY OF THE WELFARE STATE
ECTS Credits: 6

Sociology

Rationale and Purpose of the Module: The key focus and aim of the module is to provide students with an understanding of the welfare state. Students will be familiarised with debates, definitions and theoretical frameworks pertaining to the concept of the welfare state, the different models of welfare in existence, and the need for a rigorous analysis of the welfare state. In addition to enhancing students awareness and understanding of key sociological theories, concepts and issues, this module is oriented to developing students ability to use sociology as an analytical tool. It is hoped that students will consider the issues covered in the module as case studies through which they can develop their understanding of the techniques of sociological analysis, which may then be applied to other contexts.

Syllabus: This module aims to provide students with an understanding of the welfare state. Students will be familiarised with debates, definitions and theoretical frameworks pertaining to the concept of the welfare state, the different models of welfare in existence, and the need for a rigorous analysis of the welfare state. The module examines the development of welfare provision and the different models of welfare throughout Europe & in the USA. Specifically the module will focus on the Irish context as it seeks to examine the structural, cultural and ideological dynamics underpinning the Irish model of welfare provision. We will engage with current and established sociological theories and debates as a means of interpreting and understanding the implications these issues have for the distribution of power, the concept of and the operation of citizenship, processes of social exclusion, the role of social policy, and public discourse.

SO4037 - QUALITATIVE METHODS FOR SOCIOLOGICAL RESEARCH
ECTS Credits: 6

Sociology

Rationale and Purpose of the Module: The aim of the module is to provide students with an understanding of the development of the field of qualitative research and to introduce students to the central methods and approaches that fall under the category of qualitative research. Furthermore students will be provided with guidelines governing research that is grounded in the assumptions of qualitative methodology.

Syllabus: What is qualitative research? What are the different paradigms, which fall within the parameters of qualitative research? The history of qualitative research. Approaching research from a qualitative perspective, generating ideas, defining cases, analysis and interpretation. Doing interviews and conducting observation studies.

SO4057 - SOCIOLOGY OF HEALTH AND ILLNESS
ECTS Credits: 6

Sociology

Rationale and Purpose of the Module: The aim of this course is to introduce students to the important sub-disciplinary field of the sociology of health and illness.

The overall objective is to develop the students analytical ability to examine the concepts of health and illness from a sociological perspective (perspectives), and critique the structures and processes involved in these within late modern Western society.

Syllabus: THEME I: NEW SOCIO-CULTURAL DIMENSIONS
The sociology of the body/embodiment
The sociology of risk

THEME II: SCIENCE, TECHNOLOGY & MEDICINE
Theorising the relationship between science, technology
Inter-professional relationships: power, knowledge and medicine
Human Genetics and the redefinition of disease
Reproductive genetics, predictive testing and the construction of risk
New reproductive technologies: assisted reproduction and infertility

THEME III: SOCIAL PERSPECTIVES ON MENTAL HEALTH & ILLNESS
The social construction of mental illness
Social models of mental health & illness
Therapeutic and social meanings of the recovery concept

THEME IV: THE MEANINGS AND EXPERIENCES OF HEALTH, ILLNESS & DEATH
The social construction of health, illness & disease
The experience of chronic illness
Illness related stigma
Death and dying

THEME V: SOCIAL STRUCTURE AND HEALTH
Social Class and health
Gender and health
Ethnicity and health

THEME VI: MEDICINE, POWER AND AUTONOMY
The professional dominance of medicine in healthcare
Inter-professional relationships: power, knowledge and jurisdiction.
Alternative and complementary medicine

SO4063 - INTRODUCTION TO SOCIAL RESEARCH METHODS
ECTS Credits: 6

Sociology
Rationale and Purpose of the Module: The aim of this module is primarily to provide a general introduction to the range of quantitative and qualitative research methods which are used in sociological research. Secondly, the course introduces students to the underlying epistemological, conceptual and ethical dimensions of the research process. In addition, the course establishes the importance of understanding social research in the context of some key debates in contemporary sociology. The primary objective is to provide students with basic skills in the use of both quantitative and qualitative techniques of research, and experience in collecting, handling, organising and analysing data of their choice.

Syllabus: This module enables students to gain an understanding of the principles of social research and related philosophical debates from a generic social science perspective. The module addresses the ethical and legal dimensions of, and power relationships within, the research process. Students learn to appreciate the variety of methodological techniques, how to judge which are appropriate to particular research problems and how to identify the merits and limitations of different types of research design, including issues of sampling, sampling error, objectivity, values and validity. They are introduced to basic statistics, SPSS, and Qualitative Techniques in Context and thus provided with a foundation for future advanced methods modules. This module covers: conceptualisation and operationalisation in research design; an introduction to qualitative techniques; analysing qualitative data; surveys and sampling; descriptive statistics and inferential statistics (SPSS); political and ethical issues in social research; presenting and dissemination research; experimental and documentary methods in social research.

SO4067 - SOCIOLOGY OF WORK
ECTS Credits: 6

Sociology
Rationale and Purpose of the Module: This module introduces students to classic social theory. Key work is reviewed, incorporating various perspectives from classic thinkers who continue to have an enduring influence on the sociological imagination. The module will consider some of the major works of: Marx, Durkheim, Weber, Simmel, Schutz and Mead.

Syllabus: The module begins by outlining the socio-historical transformations (industrialisation, urbanisation, expansion of capitalism) that gave rise to classic social theory. Key thinkers, who sought to make sense of modernity and the problem of social reality, are then discussed; such as: Mark, Durkheim, Weber, Simmel, Mead and Schutz. Discussion will focus on their different analyses of, among other things: the development of capitalism and the money economy; the division of labour; social solidarity; class conflict and ideology; rationalisation; religious life; the structures of the life-world; the dynamics of symbolic interactions and the self. The module considers analyses of historically unfolding macro-social structures, meso-social formations (e.g. bureaucratic organisation) and the vicissitudes of everyday life. The import of classic social theory to the discipline of sociology - including its aims, scope and analyses of modernity - is a theme that runs through the module.

SO4118 - SOCIOLOGY OF GENDER AND POPULAR CULTURE
ECTS Credits: 6

Sociology
Rationale and Purpose of the Module: a. To provide an opportunity for the student to examine 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.

SO5051 - RESEARCHING SOCIAL EXCLUSION
ECTS Credits: 9

Sociology

Rationale and Purpose of the Module: The concept of exclusion forms the central focus around which this module is organised, it offers the possibility of considering how finely tuned are the mechanisms whereby we are integrated or cut off from full involvement in the wider society.

Syllabus: The course critically interrogates the concept of social exclusion examining its economic, social, cultural, political and ideological underpinnings. It focuses in particular on the process of othering as a practice of domination and the subtle ways in which privilege is reproduced. Through the course students will be enabled to untangle the notion of exclusion, its dynamics, processes involved, the implications of exclusion and the structural, cultural and ideological issues underlying this phenomenon and its reproduction. Through Bourdieus conceptual arsenal students will be facilitated to consider the hierarchial ordering of the process of exclusion and the multi-faceted and interlinked nature of domination, privilege and exclusion.

SO6031 - FEMINIST APPROACHES TO RESEARCH
ECTS Credits: 3

Sociology

Rationale and Purpose of the Module: 1. To provide an overview of feminist and queer theoretical debates, including feminist theory, masculinity studies, queer and transgender theory.
2. To assess critically different theoretical positions in gender and sexuality theory
3. To apply feminist and queer theoretical concepts and arguments to particular substantive topics such as family and work.
4. To examine how gender interacts with other identity markers like age, ethnicity, race, class, ability, sexuality.
5. To identify how notions like identity, self, nation are gendered and culturally constructed.
6. To examine changing cultural representations of feminism, gender and sexuality.

Syllabus: This course will review and critically examine the main theoretical approaches to gender, sexuality and the position of women and men in society, starting in the late eighteenth century, but concentrating on the period from the 1970s onwards. The module will analyse theories about the social and cultural construction of gendered identities, their origin, maintenance and representation. It will pay attention to intersectionality, the connection between gender and other identity markers like age, ethnicity, race, ability, sexuality, class etc. Of central importance is the practical application of different theoretical positions to specific topics like gender and employment, gender and childhood, gender and the body, gender and nationalism, gender and the media, gender and the family.

S06021 - THEORETICAL APPROACHES TO GENDER, CULTURE AND SOCIETY 1
ECTS Credits: 9

Sociology

Rationale and Purpose of the Module: 1. To provide an overview of feminist and queer theoretical debates, including feminist theory, masculinity studies, queer and transgender theory.
2. To assess critically different theoretical positions in gender and sexuality theory
3. To apply feminist and queer theoretical concepts and arguments to particular substantive topics such as family and work.
4. To examine how gender interacts with other identity markers like age, ethnicity, race, class, ability, sexuality.
5. To identify how notions like identity, self, nation are gendered and culturally constructed.
6. To examine changing cultural representations of feminism, gender and sexuality.

Syllabus: This 3 credit module on feminist research methodology will supplement the 9 credit disciplinary research module undertaken by students. It will enable students to bring feminist critiques of knowledge and methodology to their research and writing up the dissertation. Students will address questions such as:

What have feminist theorists to say about objectivity and truth/ the distinction between knower and known/ self and other/ mind and body/ subject and object? How might we understand culture and society differently if we incorporate reproduction, bodily work, and intimate relations in our research? What might be the limits of feminist standpoint, the idea that women, as a subordinated group, are in a better position to arrive at an adequate representation of social reality than men? What kinds of questions guide feminist research? How do feminist researchers approach the objects of their research? What is the relationship between the object of research and the feminist researcher?

SP4001 - WHO ARE THE SPANIARDS?
INTRODUCTION TO SPANISH CULTURE
ECTS Credits: 6

School of Modern Languages and Applied Linguistics

Rationale and Purpose of the Module: The development of Spanish culture has been marked by different attempts at constructing a national identity in different forms, from the attempts at uniformity promoted by the Spanish Empire ûthen re-appropriated by the dictatorship of Francisco Franco- to the re-construction of an identity directed towards the integration of Spain in Europe and, more recently, the attempts to construct an identity which integrates both past and present.

Accordingly, the module will pay special attention to the cultural impact of the end of the Spanish Empire, the Spanish Civil War and the Transition to Democracy. After completion of this module, students will have achieved knowledge but solid knowledge of the main socio-political processes in Spanish history and their effects on and interaction with literary and film production, as well as other forms of culture.

Syllabus: This module offers an introduction to the most important events and movements in Spanish culture. It focuses mainly on the cultural impact of the Spanish Empire, the Spanish Civil War, the dictatorship of Francisco Franco, and the Transition to Democracy. Through the use of literature, music, film and other forms of culture, the module will serve as a platform for the exploration of up-to-date socio-political issues in Spain and their effect on cultural production.
SP4003 - SOCIO-POLITICAL ISSUES IN THE CONTEMPORARY HISPANIC WORLD: SOCIETY, CULTURE AND REPRESENTATION
ECTS Credits: 6

School of Modern Languages and Applied Linguistics

Rationale and Purpose of the Module: Aims and Objectives:
* To further develop students background knowledge of the Hispanic World.
* To explore contemporary socio-political issues and their impact on cultural production in Spain and Latin America.
* To develop students analytical skills in the study of contemporary Hispanic culture.
* To prepare students to analyse contemporary socio-political issues in the Hispanic World in a critical manner.

Syllabus: This module builds on the foundation modules taken in year one. Students will explore issues of relevance in contemporary society in Spain and Latin America by means of the exploration of up-to-date cultural production about such issues. Accordingly, the module will focus on the politics and representation of gender, cultural constructions of the past and contemporary developments in the construction of national identities. After completion of this module, students will have achieved an in-depth knowledge of contemporary socio-political issues in the Hispanic World and their cultural representation, thus enhancing their understanding of the cultures they will be encountering during their off-campus period.

SP4007 - MODERN TRENDS IN HISPANIC CULTURE AND THE ARTS
ECTS Credits: 6

School of Modern Languages and Applied Linguistics

Rationale and Purpose of the Module: This module offers an introduction to the main the artistic forms of expression in the Hispanic world which constituted a break with the traditional canons and therefore signalled the beginning of modernity both in Latin America with the movement of 'Modernismo' and in Spain with the work of the Romantic poet Gustavo Adolfo Bécquer who can be considered a precursor of modern poetry. These artistic forms were the beginning of a move towards modernity which culminated in Surrealism during the second decade of the 20th century. In Spain, after the civil war, artistic resistance to the dictatorship developed in the context of severe censorship and in this respect the module will also deal with cultural forms of resistance to the dictatorship of General Franco.

Syllabus: This module will focus on five areas:
- The Spanish Romantic period in art and poetry (Goya and Bécquer)
- Latin American 'Modernismo' and its legacy in Spain in the form of the 'Generación del 98'
- The Poetry of Pablo Neruda
- The Spanish 'Generación del 27' and the Spanish avant-garde: Surrealism in art and literature.
- Cultural forms of resistance to the Franco regime: The theatre of Buero Vallejo and the 'New Song', a form which often pays tribute to the Spanish poetic tradition.

SP4131 - SPANISH FOR BEGINNERS 1 (EUROPEAN STUDIES)
ECTS Credits: 6

School of Modern Languages and Applied Linguistics

Rationale and Purpose of the Module: The beginners course aims to provide the student with a strong basic knowledge of Spanish and of contemporary Spain and Latin America. The course is designed to:
Enable the student to understand and use basic structures of Spanish grammar.
Exposure to a range of vocabulary and expressions which will allow her/him to present her/himself to, and communicate with native speakers of Spanish.
To foster autonomous language learning skills.
To introduce the student to Spanish and Latin American cultures.
To develop listening and speaking skills in Spanish.
To equip the student with basic writing skills.

Syllabus: Lecture: introduction to Spanish and Latin American history, politics and cultures. These include the Spanish language and the languages of Spain, socio-cultural and historical background to Spain and Latin America from the formation of the Spanish state and the indigenous cultures of Latin America to the mid-20th century.
Tutorials and lab: working with set text-book, back-up audio-visual an online materials, students are introduced to the concepts of gender, number, verb systems and to the basic structures of the Spanish language.

SP4133 - SPANISH FOR BEGINNERS 3
ECTS Credits: 6

School of Modern Languages and Applied Linguistics

Rationale and Purpose of the Module: Consolidation of the structures, functions and vocabulary taught in the first year and expands grammatical competence to include use of the subjunctive. Development of knowledge of contemporary Spain and Latin American cultures and societies, with a particular focus on the most salient socio-cultural/political issues of contemporary Spain and Latin America.

Syllabus: Lecture: further develop the knowledge-base of Spain and Latin America developed in first year and examines some of the salient socio-cultural/political issues of contemporary Spain and Latin America. Tutorials and lab: Working with set textbook, complementary audio-visual and online material, as well as intermediate difficulty literary texts.
Prerequisites: SP4132

SP4141 - SPANISH LANGUAGE AND SOCIETY 1
ECTS Credits: 6

School of Modern Languages and Applied Linguistics

Rationale and Purpose of the Module: The course is designed to:
* Revise and broaden the students knowledge of the structures of Spanish grammar.
* Expand the students range of Spanish vocabulary.
* Improve pronunciation and patterns of intonation in Spanish.
* Further develop the students language skills by exposing them to different situation and registers, both formal and informal.
* Facilitate the students understanding of various cultural aspects within the Spanish-speaking world.
* Foster autonomous language learning.
**Syllabus:** The course is designed to:
Revise and broaden the students knowledge of the
structures of Spanish grammar.
Expand the students range of Spanish vocabulary.
Improve pronunciation and patterns of intonation in
Spanish.
Further develop the students language skills by exposing
them to different situation and registers, both formal and
informal.
Facilitate the students understanding of various cultural
aspects within the Spanish-speaking world.
Foster autonomous language learning.

---

**SP4143 - SPANISH LANGUAGE AND SOCIETY 3**
ECTS Credits: 6

School of Modern Languages and Applied
Linguistics

Rationale and Purpose of the Module: Second year
aims to build on and develop the skills introduced in the
first year course: increase the oral and written ability of
the students, enhance their linguistic competence, present
a wide range of Spanish and Latin-American literary and cultural contents and develop further
strategies for autonomous language learning.

Syllabus: The advanced course consists of four hours of
Spanish per week:
- One grammar class (grammar review and
consolidation).
- One literature class (a selection of Peninsular and Latin
American short stories and newspaper articles).
- One laboratory/oral class (communication skills).
- One General Lecture

Prerequisites: SP4142

---

**SP4147 - SPAIN EUROPE AND BEYOND**
ECTS Credits: 6

School of Modern Languages and Applied
Linguistics

Rationale and Purpose of the Module: By the end of
this module students should have:

1. developed further their command of Spanish, by

---

**SP4231 - SPANISH LANGUAGE, CULTURE AND
SOCIETY 1 (BEGINNERS)**
ECTS Credits: 6

School of Modern Languages and Applied
Linguistics

Rationale and Purpose of the Module: The beginners
course aims to provide the student with a strong basic
knowledge of Spanish and of contemporary Spain and
Latin America.
The course is designed to:
Enable the student to understand and use basic
structures of Spanish grammar.
Exposé the student to a range of vocabulary and
expressions which will allow her/him to present
her/himself to, and communicate with native speakers of
Spanish.
To foster autonomous language learning skills.
To introduce the student to Spanish and Latin American
cultures.
To develop listening and speaking skills in Spanish.
To equip the student with basic writing skills.

Syllabus: Lecture: introduction to Spanish and Latin
American history, politics and cultures. These include:
the Spanish language and the languages of Spain,
socio-cultural and historical background to Spain and
Latin America from the formation of the Spanish state
and the indigenous cultures of Latin America to the
mid-20th century.
Tutorials and lab: working with set text-book, back-up
audio-visual an online materials, students are introduced
to the concepts of gender, number, verb systems and to
the basic structures of the Spanish language.

---

**SP4233 - SPANISH LANGUAGE CULTURAL AND
SOCIETY 3 (BEGINNERS)**
ECTS Credits: 6

School of Modern Languages and Applied
Linguistics

Rationale and Purpose of the Module: Consolidation
of the structures, functions and vocabulary taught in the
first year and expands grammatical competence to
include use of the subjunctive.
Development of knowledge of contemporary Spain and
Latin American cultures and societies, with a particular
focus on the most salient socio-cultural/political issues of
contemporary Spain and Latin America.

Syllabus: Lecture: further develop the knowledge-base
of Spain and Latin America developed in first year and
examines some of the salient socio-cultural/political issues of
contemporary Spain and Latin America.
Tutorials and lab: Working with set textbook,
complementary audio-visual and online material, as well
as intermediate difficulty literary texts.

Prerequisites: SP4232

---

**SP4241 - SPANISH LANGUAGE, CULTURAL AND
SOCIETY 1**
ECTS Credits: 6

School of Modern Languages and Applied
Linguistics

Rationale and Purpose of the Module: The course is
designed to:

* Revise and broaden the students knowledge of the
structures of Spanish grammar.
* Expand the students range of Spanish vocabulary.
* Improve pronunciation and patterns of intonation in
SP4243 - SPANISH LANGUAGE, CULTURE AND SOCIETY 3
ECTS Credits: 6

School of Modern Languages and Applied Linguistics

Rationale and Purpose of the Module: Second year aims to build on and develop the skills introduced in the first year course: increase the oral and written ability of the students, enhance their linguistic competence, present a wide range of Spanish and Latin-American literary and cultural contents and develop further strategies for autonomous language learning.

Syllabus: The advanced course consists of four hours of Spanish per week:
* Two language tutorials (grammar, vocabulary, communication skills, writing and reading skills).
* One laboratory/oral class (oral communication skills).
* One General Lecture

------------------------------------------------------------

SS4128 - APPLIED SPORT PSYCHOLOGY
ECTS Credits: 6

Physical Education & Sport Sciences

Rationale and Purpose of the Module: The emphasis in this course is on the application of psychological concepts, skills and strategies to applied settings in sport for performance enhancement. Specifically, students will explore the social and psychological factors related to sport participation and peak sport performance.

Syllabus: Content relating to performance enhancement includes psychological characteristics of peak performance, characteristics of elite athletes and their development, increasing of awareness; selected mental skills and strategies (e.g. muscle relaxation, autogenic training, meditation, self talk, plans & routines, simulation training); guidelines and procedures for implementing intervention strategies; conducting mental skills training programmes. Attention will also be given to the environment in which sport occurs focusing on aspects of group dynamics.

------------------------------------------------------------

SS4145 - PERCEPTION AND COGNITION IN ACTION
SS4202 - INTRODUCTION TO MAJOR PHYSIOLOGICAL SYSTEMS
ECTS Credits: 6

Physical Education & Sport Sciences

Rationale and Purpose of the Module: A thorough understanding of how the body functions underpins all subject areas in the study of sport, exercise sciences and physiotherapy. Physiology (from Greek Physio meaning nature and -logy meaning the study of) deals with the coordinated activities of cells, tissues, organs and systems. In this module students are introduced to the basic structures and functions of human physiological systems and the integration of these systems to maintain homeostasis.

Syllabus: NA

SS4203 - PHYSIOLOGY OF MUSCLE IN MOVEMENT
ECTS Credits: 6

Physical Education & Sport Sciences

Rationale and Purpose of the Module: This module aims to deliver a thorough knowledge and understanding of skeletal muscle function. It will allow students to understand how skeletal muscle adapts to exercise, training and disease. By the end of the module students should have a full understanding of the Physiology of muscle applicable in sport and exercise sciences and in physiotherapy.


Prerequisites: SS4202

SS4205 - NUTRITION, EXERCISE METABOLISM AND SPORTS PERFORMANCE
ECTS Credits: 6

Physical Education & Sport Sciences

Rationale and Purpose of the Module: Probably greater than any other component of the physiology syllabus, the application of good nutritional practice and nutritional manipulation has made a significant impact upon general health and sporting performance. This course is designed to provide a thorough understanding of the nutritional needs of exercise, exercise metabolism and the use and abuse of nutritional (ergogenic) aids to improve health, training and competitive performance.


Prerequisites: BC4002

SS4217 - EXERCISE AND HEALTH
ECTS Credits: 6

Physical Education & Sport Sciences

Rationale and Purpose of the Module: This is a module which brings together the knowledge you gained in the last three years to investigate aspects of exercise and health. These include sport performance, lifestyle and general well being. Included in this module are examples of how exercise may be used prospectively to improve the quality of life and also as an adjunct therapy to clinical medicine in the treatment of life-threatening disease. Underpinning this content is the filed of physical activity behaviour determinants, recommendations, measurement, interventions, levels and policy and promotion.

Syllabus: The module delivers core knowledge in lecture format. Further understanding and breadth are gained by self directed learning.
**SS4231 - HUMAN PHYSIOLOGICAL SYSTEM FOR SPORT AND EXERCISE SCIENCES**
ECTS Credits: 3

**Physical Education & Sport Sciences**

**Rationale and Purpose of the Module:** A thorough understanding of how the human body functions underpins all subject areas in the study of Sport, Exercise Sciences. Physiology deals with the coordinated activities of cells, tissues, organs and systems. In this module students are introduced to the basics of several human physiological systems and the integration of these systems to maintain homeostasis.

**Syllabus:** This module will cover material on the function of several human physiological systems including the nervous, urinary, endocrine, immune and digestive systems.

**SS4305 - QUANTITATIVE BIOMECHANICAL ANALYSIS**
ECTS Credits: 6

**Physical Education & Sport Sciences**

**Rationale and Purpose of the Module:** To further advance the students' knowledge of biomechanics within both sport and exercise and to further explore the quantitative domain of biomechanics.

**Syllabus:** Overview of measurement techniques in biomechanics. Data smoothing techniques and criteria for their optimisation including residual analysis. Free body diagram analysis of human movement. Mechanical properties of biological materials. Introduction to human simulation theory.

**Practical Content**
- Force plate data capture and subsequent analysis.

**SS4308 - ADVANCED BIOMECHANICS ANALYSIS**
ECTS Credits: 6

**Physical Education & Sport Sciences**

**Rationale and Purpose of the Module:** To consolidate students' understanding of kinematics

**AIMS:**
- To apply 3D analysis techniques to selected sporting and exercise activities
- To develop 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:**
- Advanced biomechanical analysis skills in 2D and 3D analysis of motion

**SS4312 - QUALITATIVE BIOMECHANICAL ANALYSIS**
ECTS Credits: 6

**Physical Education & Sport Sciences**

**Rationale and Purpose of the Module:**
- To enable the student to extend their coaching knowledge and ability in a specific sport and in the related areas of pedagogy, exercise prescription and physical conditioning / training.

**Syllabus:**
- Sports: Students will be required to select one sport from three offered during the semester. In addition to the sports specific content, common elements of pedagogy (reflective practice, ethics in coaching and the development of 'expert' coaches) and applied physical conditioning will be included.


**Physical Conditioning 2:** Sport-specific warm-ups and cool down. Circuit training - different types, structure and phases. Flexibility development - active and passive techniques. Resistance training - selection, structure, progressions, regressions. Plyometric training - slow and fast SSC exercises. Devising and implementing training programmes. Aspects of organisation and safety will be addressed throughout. Developing competence in demonstrating specific exercise techniques, competence in spotting and coaching, knowledge and understanding of progressions and regressions are key elements of this element.

**Prerequisites:** SS4402
SS4411 - COACHING SCIENCE AND PERFORMANCE

ECTS Credits: 3

Physical Education & Sport Sciences

Rationale and Purpose of the Module: To give students a basic proficiency, understanding and appreciation of rules, principles, tactics and demands of a selected sport. To introduce students to basic coaching skills and current issues.

Syllabus: Sports: Students will learn about and through a selective individual/dual sport. In addition to sport specific content (skills and tactics), common elements of coaching and applied physical conditioning will be included.

Pedagogy: Criteria for effective coaching, philosophy and role of the coach, coaching styles, communication, group organisation and management, demonstrations, safety and ethics in sport.

SS4417 - HUMAN PERFORMANCE EVALUATION

ECTS Credits: 6

Physical Education & Sport Sciences

Rationale and Purpose of the Module: To gain insights into how human performance objectives in sport and health are achieved by integrating as appropriate knowledge and techniques associated with the disciplines of physiology, biomechanics, psychology and exercise and health. Effective application of measurement, testing, interpretation and evaluation techniques associated with the named disciplines will be a key focus of the module.

Syllabus: This is a final year integrative module that aims to complement research skills gained in the sport and exercise science final year project with practical skills and experience in sport and exercise evaluation. The course will consist of lectures on the theory and practice of performance evaluation in an integrative format to make the students critically aware of appropriate testing for different populations and the on an individual basis students will prepare a comprehensive piece of written work on effective evaluation processes pertaining to human performance and functioning in the context of sport and health. In a team-based exercise, students will make a seminar presentation on an effective evaluation process for a specific scenario in the sport and health domain.

SS6002 - APPLIED SPORT PSYCHOLOGY

ECTS Credits: 6

Physical Education & Sport Sciences

Rationale and Purpose of the Module: The emphasis in this course is on the application of psychological concepts, skills and strategies to applied settings in sport for performance enhancement. Specifically, students will explore the social and psychological factors related to sport participation and peak sport performance.

Syllabus: Content relating to performance enhancement includes psychological characteristics of peak performance, characteristics of elite athletes and their development, increasing of awareness; selected mental skills and strategies (e.g. muscle relaxation, autogenic training, meditation, self-talk, plans & routines, simulation training); guidelines and procedures for implementing intervention strategies; conducting mental skills training programmes. Attention will also be given to the environment in which sport occurs focusing on aspects of group dynamics.

SS6011 - ANALYSIS OF MOTOR SKILL PERFORMANCE AND LEARNING

ECTS Credits: 6

Physical Education & Sport Sciences

Rationale and Purpose of the Module: To give knowledge and understanding of how movement skills are controlled during performance and also how they are best practised and learned. Course content will be based on research findings and theories which will be critically reviewed. There will be a strong applied dimension with the purpose of providing students with a theoretical basis for making informed decisions regarding the structuring of practice for motor skills. The module would be of interest to those from a variety of disciplines and areas involving motor skill performance and learning e.g. sport, dance, rehabilitation, industry, ergonomics.

Rationale and Purpose of the Module: To provide tuition and practice in the four language skills at academic level

Syllabus: Students work from a set text book, back-up audio visual and on-line material.

Integrated tuition and practice is given in the four language skills.

The following grammatical areas are covered: Phrasal verb structure, position of adverbs, future time forms, conditionals, narrative tenses, modal verbs of deduction lexis e.g. frequent collocations, common expressions, conversational responses and idioms, discourse markers (oral and written) e.g. connectives, sequencing, signposting.

The following areas are covered: grammar; modals and meaning, the perfect infinitive, mixed conditionals, tenses in accounts and narratives, all aspects of reported speech
Lexis: word-building, compound adjectives, synonyms, confusable words, metaphorical language, intensifying adverbs, discourse markers, phrasal verbs, collocations, British v American English
Recognition and use of the IPA future forms, wishes and regrets, defining and non-defining relative clauses, noun clauses, adverb clauses, perceptive v progressive aspect, gerunds, infinitives

TE4021 - ENGLISH AS A FOREIGN LANGUAGE 1 (UPPER INTERMEDIATE)
ECTS Credits: 6

School of Modern Languages and Applied Linguistics

Rationale and Purpose of the Module: To provide language support to students on the Erasmus exchange programmes to enable them to benefit more fully from their Erasmus experience at a social, cultural and academic level
To provide tuition and practice in the four language skills of listening, speaking, reading and writing.

Syllabus: Students work from a set text book, back-up audio visual and on-line material.

Integrated tuition and practice is given in the four language skills.

The following grammatical areas are covered: Phrasal verb structure, position of adverbs, future time forms, conditionals, narrative tenses, modal verbs of deduction lexis e.g. frequent collocations, common expressions, conversational responses and idioms, discourse markers (oral and written) e.g. connectives, sequencing, signposting.

The following areas are covered: grammar; modals and meaning, the perfect infinitive, mixed conditionals, tenses in accounts and narratives, all aspects of reported speech
Lexis: word-building, compound adjectives, synonyms, confusable words, metaphorical language, intensifying adverbs, discourse markers, phrasal verbs, collocations, British v American English
Recognition and use of the IPA future forms, wishes and regrets, defining and non-defining relative clauses, noun clauses, adverb clauses, perceptive v progressive aspect, gerunds, infinitives

TE4031 - ENGLISH AS A FOREIGN LANGUAGE 1 (ADVANCED)
ECTS Credits: 6

School of Modern Languages and Applied Linguistics

Rationale and Purpose of the Module: To provide language support to students on the Erasmus exchange programmes to enable them to benefit more fully from their Erasmus experience at a social, cultural and academic level
To provide tuition and practice in the four language skills of listening, speaking, reading and writing.

Syllabus: Students work from a set text book, back-up audio visual and on-line material.

Integrated tuition and practice is given in the four language skills.

The following grammatical areas are covered: Phrasal verb structure, position of adverbs, future time forms, conditionals, narrative tenses, modal verbs of deduction lexis e.g. frequent collocations, common expressions, conversational responses and idioms, discourse markers (oral and written) e.g. connectives, sequencing, signposting.

The following areas are covered: grammar; modals and meaning, the perfect infinitive, mixed conditionals, tenses in accounts and narratives, all aspects of reported speech
Lexis: word-building, compound adjectives, synonyms, confusable words, metaphorical language, intensifying adverbs, discourse markers, phrasal verbs, collocations, British v American English
Recognition and use of the IPA future forms, wishes and regrets, defining and non-defining relative clauses, noun clauses, adverb clauses, perceptive v progressive aspect, gerunds, infinitives

TE4107 - TEACHING ENGLISH TO SPEAKERS OF OTHER LANGUAGES (TESOL) 2
ECTS Credits: 6

School of Modern Languages and Applied Linguistics

Rationale and Purpose of the Module: To give students a theoretical and practical understanding of classroom teaching in the ESOL context, including: an introduction to lesson planning; teaching productive and receptive skills; teaching vocabulary, grammar and pronunciation relevant to the ESOL context.
To enable students to develop a more advanced knowledge of the grammatical and phonological aspects of the English language relevant to TESOL.
To give students the opportunity to practically apply aspects of the above knowledge through peer teaching or teaching practice.
To allow students to develop an understanding of the different levels of language competency in the ESOL classroom.

This is the second of a three-module suite, preceded by TE4025 (TEFL 1), TE4026 (TEFL 2) and TE4028 (TEFL 3). The roll out of this new stream of TESOL modules will not affect students currently completing the TEFL suite of modules, and they will exit with a TEFL certificate. New entrants in the academic year 2014/15 will start the new TESOL suite of modules.

Syllabus: The module is structured into three independent but related components:
1. A theoretical and practical introduction to ESOL classroom teaching to include the teaching of the receptive skills (reading and listening) and productive skills (writing and speaking), the teaching of vocabulary and semantic concepts and the teaching of grammar and pronunciation.
2. The further development of knowledge in relation to grammatical aspects of the English language to include active and passive voice and direct and indirect speech and the development of a more advanced understanding of the English sound system at both the micro- and the macro-level.
3. The practical application of the above knowledge through practice.

Prerequisites: TE4025

TW4003 - INTRODUCTION TO TECHNICAL COMMUNICATION
ECTS Credits: 6

School of Culture and Communication

Rationale and Purpose of the Module: This module is designed to replace TW4115: Principles of Professional and Technical Communication and Information Design. This module is being developed to fully de-couple undergraduate and postgraduate modules which were historically taught together, but are now fully separate. The new title is also clearer. The module’s purpose is to introduce students to the disciplines of technical and professional communication and information design; to establish a rigorous standard in the writing of clear, concise, correct English appropriate for technical communication; to develop the students’ ability to choose appropriate writing styles for a range of technical communication genres and diverse audiences; to provide practice through a range of assignments designed to improve the students’ performance in creating different types of documentation: summaries, brochures etc.; and to develop the students’ expertise in using the tools of the profession. This module introduces technical communication for different genres. More advanced modules include content on referencing and academic writing.
Syllabus: Introduction to technical communication; audience analysis; writing style for technical communication; information design; typography; colour; graphics and illustrations; technical communication genres; writing summaries; designing and writing brochures.

TX4007 - TAXATION FOR CORPORATES
ECTS Credits: 6

Accounting & Finance

Rationale and Purpose of the Module: This module aims to provide an understanding of Irish Corporation Tax, the rationale for incorporation of a business, the taxation implications of close company status and the effective use of losses and group reliefs. It also introduces students to the principles of Value Added Tax (VAT) and the application of VAT in a business context.

Syllabus: General principles of Irish Corporation Tax. The rationale for, and the tax implications of, incorporation. Computation of the corporation tax liability. Loss relief for companies, group relief for losses, charges and transfer of assets. Close companies, definition and consequences. Tax planning for companies including restructuring to maximise tax reliefs. Current issues in Corporation Tax. Introduction to VAT, general principles, administration, registration and deregistration, exemptions and zero rating, inter EU to VAT, general principles, administration, registration reliefs. Current issues in Corporation Tax. Introduction for companies including restructuring to maximise tax losses, charges and transfer of assets. Close liability. Loss relief for companies, group relief for

TX4305 - TAXATION THEORY AND PRACTICE
ECTS Credits: 6

Accounting & Finance

Rationale and Purpose of the Module: This module is designed to provide students with an understanding of the theoretical and legal framework of taxation. It aims to give students a thorough understanding of the manner in which individuals and unincorporated businesses are taxed in the State. The module reviews the taxation implications of business decisions and introduces the basics of tax planning.

Syllabus: Introduction to the theory of taxation and basic tax policy; overview of Irish income tax system; the self-assessment system; personal tax computations; Schedule E employment income, benefits in kind and termination payments; interest income, rental income, foreign income, dividend income; the taxation treatment of married couples; the measurement of taxable business profits, allowable and disallowable expenditures, commencement and cessation of trading; capital allowances, balancing allowances and charges; the effects of residence and domicile of individuals on tax liability; basics of tax planning; the annual budget

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 & Reliefs; CGT Retirement Relief; Transfer of a Business to a Company; CGT and Share Transactions CGT and Liquidation of Companies; Company Purchasing its Own Shares; Principle Private Residence Relief; CGT and Development Land; Introduction to Capital Acquisitions Tax; Basic Concepts & Reliefs; Business Relief; Agricultural Relief; Taxation of Trusts; Foreign Aspects; Stamp Duty.

WT4003 - CONSTRUCTION TECHNOLOGY AND MANAGEMENT 2
ECTS Credits: 6

School of Engineering

Rationale and Purpose of the Module: The aim of this module is to provide a comprehensive introduction to industrial, high-rise and construction practice and technology

Key objectives
Provide knowledge of
* Organising and selecting resources needed to successfully complete the project

WT4401 - CONSTRUCTION TECHNOLOGY AND MANAGEMENT 1
ECTS Credits: 6

School of Engineering

Rationale and Purpose of the Module: The aim of this module is to provide a comprehensive introduction to every aspect of the technology of domestic low-rise construction, and to present this in a rational and logical progression reflecting the construction process.

Syllabus: Introduction to the Building Regulations and
Technical Guidance Documents.
Site works, temporary works, subsoil drainage, excavations, scaffolding.
Radon problems and prevention. Radon membranes and sumps.
Substructure construction techniques, foundations û strip, raft and piled, concrete. Damp proof courses and membranes.
Superstructure construction techniques, stonework, brickwork, blockwork, cavity walls.
Floors - suspended timber, raised access, precast concrete, hollow block, waffle slabs.
Roofs û timber, flat and pitched, tiling, asphalt flat roofs, roof lights and ventilation.
Stairs û timber, reinforced concrete and precast concrete.
Detailing of opes, eaves and other junctions.
Sound insulation û airborne, impact & flanking. Soundproofing.
Thermal insulation, thermal bridging, condensation and draughtproofing. Basic U-value calculation.

WT4503 - STRUCTURAL MECHANICS
ECTS Credits: 6

School of Engineering

Rationale and Purpose of the Module: To develop the student's understanding of:
* force systems
* criteria for structural design
* structural behaviour

Syllabus: SI units and manipulation of formulae, sources and types structural loading, reactions and supports, free body diagrams, shear force and bending moment calculations, static determinacy and indeterminancy, qualitative analysis of beams and frames, stability and analysis of pin jointed frames, section properties, engineers equation of bending.

These topics will be covered through lectures, tutorials, experimentation and problem solving projects.

WT4505 - BUILDING ECONOMICS
ECTS Credits: 6

School of Engineering

Rationale and Purpose of the Module: The overall aim of this module is to illustrate the application of economic principles to the building and construction process.

Specific objectives include providing the student with;
* An overview of the construction industry and its role in the economy
* An understanding of the construction firm and its management from an economic perspective
* The economic considerations in evaluating building projects and making decisions.

Syllabus: The construction industry, its economic development, structure and role in the economy, construction as a production process. Management of firms, costs, revenues and markets from the point of view of economists and managers. Strategic decision making in property development and project appraisal and feasibility studies. Linking the economics of the production process of construction to the economics of its output, buildings and structures of the built environment. Cost modelling techniques, cost and price forecasting, cost product and process modelling, dealing with uncertainty. Building design, its interaction with the construction process in determining the cost and quality of buildings. The economics of buildings essential resources, energy efficiency and its cost. Cost limits and values, determining value for money Commercial values and the property market.

Prerequisites: WT4804

WT4507 - FORENSIC ENGINEERING AND ETHICS
ECTS Credits: 6

School of Engineering

Rationale and Purpose of the Module: The aim of this module is to provide an understanding of the different forms of contract and their commercial implications, and provide project managers with an overview of the procurement and contracting processes as part of the overall project management process.

The specific objectives are to provide learners with the knowledge of;
* The different types and forms of contract used in procuring services for projects.
* The principle elements of a contract and contract law
* Standard contract forms and how they are used in the various stages of the project lifecycle
* The procurement process and the perspectives of different parties
* Contract administration, issues underlying disputes and claims.

Prerequisites: WT4804

School of Engineering
**Syllabus:**


**Prerequisites:** WT4804, WT4704

---

### WT4705 - BUILDING PRODUCTION

**ECTS Credits:** 6

**School of Engineering**

**Rationale and Purpose of the Module:** To introduce the student to the science and art of New Product Development within the construction domain. It links the manufacturing and construction skills learnt in earlier modules with the design process and these are brought together by means of a project. The project is intended to take the student through the basic design process into requirements engineering, market analysis, materials, manufacturing processes and the production of an initial business plan.

**Syllabus:**

- Problem definition and clarification - design briefs; New Product Development (NPD) Concurrent Engineering NPD vs Traditional NPD; The deliverables of processes of design; NPD Failure Reasons, Rationale for Concurrent Engineering.
- Concept Evaluation - Ranking Methods, Concept Assessment Techniques, AHP. - Pugh's Concept Selector, Convergence and Divergence.
- Design for Assembly (DFA).
- Intellectual Property - Patents, Application Process and requirements. - Copyright, trademarks and design registration.

**Prerequisites:** WT4804, WT4704

---

### WT4707 - CONSTRUCTION TECHNOLOGY AND MANAGEMENT 3

**ECTS Credits:** 6

**School of Engineering**

**Rationale and Purpose of the Module:** The aim of this module is to provide an understanding of overall project management process and principles and how they apply to construction projects.

**Syllabus:**

- Introduction to Construction Project Management and PM Software - purpose, concepts and conventions.
- Construction Planning Tools and Techniques - Schedule Definition and Management; Construction Project Network Analysis, Critical Path, PERT & Line of Balance.
- Resource Allocation & Levelling - labour, material and equipment.
- Site Establishment and Management.
- Managing Resources and Costs.
- Communications & Change Control Management - Site Meetings and Progress Reports.
- Leadership and Negotiation Skills on Construction Projects.
- Construction Risk Management - Identification, Analysis, Response and Control.
- Construction Productivity Improvement - Define, Measure, Analyze, Improve and Control.

**Prerequisites:** WT4401, WT4502, WT4003