



## Spring Semester 2021 Course/Module Booklet



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# Module Codes - Explained

## 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 the 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.

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

**05** is just the departmental way to distinguish between classes.

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

Odd numbers (1, 3, 5, 7) are fall semester classes.

Even numbers (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.

Module	Faculty	Department
AC	BUS	ACF
AR	SEN	ARC
BC	SEN	CES
BY	SEN	LSC
CE	SEN	CEM
CG	SEN	CES

CH	SEN	CES
CM	BUS	MMA
CS	SEN	CSI
CU	AHS	MLA
DM	SEN	DMT
EC	BUS	ECO
ED	SEN	ECE
EE	SEN	ECE
EH	AHS	CCO
EN	EHS	EPS
EP	BUS	MMA
EQ	SEN	LSC
ER	SEN	LSC
ET	SEN	ECE
EV	SEN	LSC
FI	BUS	ACF
FR	AHS	MLA
FT	SEN	LSC
GA	AHS	CCO
GE	AHS	MLA
HI	AHS	HIS
HS	SEN	CES
IN	BUS	ACF
JA	AHS	MLA

JM*	AHS	CCO
LA	AHS	LAW
LI	AHS	MLA
LP	AHS	LAW
LS	SEN	LSC
MA	SEN	MAS
MB	SEN	MAS
MD	HUM	HUM
ME	SEN	MAB
MF	SEN	DMT
MG	BUS	MMA
MN	BUS	MMA
MS	SEN	MAS
MT	SEN	CEM
MU	HUM	HUM
NS	EHS	NMI
Module	Faculty	Department
PA	AHS	PPA
PD	SEN	DMT
PH	SEN	PHE
PM	BUS	PER
PO	AHS	PPA
PS	EHS	DMT
PT	SEN	DMT
PY	EHS	PHE
RM	AHS	CCO

SN	EHS	NMI
SO	AHS	SOC
SP	AHS	MLA
SS	EHS	PES
TE	AHS	MLA
TW	AHS	CCO
TX	BUS	ACF
WT	SEN	CEM

\*Only open to Journalism Majors

## Faculty Key

BUS	Kemmy 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.

Module code	Academic area	Department
AC	Accounting	Accounting and Finance
AR	Architecture	School of Design
BC	Biochemistry	Chemical Sciences
BR	Broadening modules	N/A
BY	Biology	Biological Sciences
CE	Computer Engineering	School of Engineering
CG	Chemical Sciences	Chemical Sciences
CH	Chemistry	Chemical Sciences
CS	Computer Software	Computer Science and Information Systems
CU	Cultural Studies	School of Modern Languages and Applied Linguistics
DM	Design & Manufacturing	School of Engineering
EC	Economics	Economics
ED	Electrical Distribution	Electronic and Computer Engineering
EE	Electronic Engineering	Electronic and Computer Engineering
EH	English studies	School of Culture and Communications
EN	Education	School of Education
EP	Entrepreneurship	Management and Marketing
EQ	Equine Science	Biological Sciences
ER	Environmental Science	Chemical Sciences
ET	Electronic Technology	Electronic and Computer Engineering
EV	Equine Science	Biological Sciences
FI	Finance	Accounting and Finance
FR	French	School of Modern Languages and Applied Linguistics
FT	Food Technology	Biological Sciences
GA	Gaeilge	School of Culture and Communication
GE	German	School of Modern Languages and Applied Linguistics
HI	History	History
IN	Insurance	Accounting and Finance

Module code	Academic area	Department
JA	Japanese	School of Modern Languages and Applied Linguistics
JM	Journalism	School of Culture and Communication
LA	Law	Law
LI	Linguistics	School of Modern Languages and Applied Linguistics
MA	Mathematics	Mathematics and Statistics
MB	Mathematics	School of Education
MD	Music and Dance	Humanities
ME	Mechanical Engineering	School of Engineering
MF	Manufacturing	School of Engineering
MG	Management	Management and Marketing
MI	Management of Information	Management and Marketing
MK	Marketing	Management and Marketing
MS	Mathematics & Statistics	Mathematics and Statistics
MT	Materials	School of Engineering
MU	Music	Humanities
NS	Nursing	Nursing and Midwifery
PA	Public Administration	Politics and Public Admin
PD	Product Design	School of Design
PH	Physics	Physics
PM	Personnel Management	Personnel and Employment Relations
PO	Politics	Politics and Public Admin
PS	Psychology	Psychology
PT	Production Tools	School of Engineering
PY	Physical Education	Physical Education and Sports Sciences
RE	Robotics Engineering	School of Engineering
RM	Research Methods	School of Culture and Communications
SN	Sociology / Nursing	Nursing and Midwifery

Module code	Academic area
SP	Spanish
SS	Sport Sciences
TE	English as a Foreign
TW	Technical Writing
TX	Taxation
WT	Wood Technology

## Faculty of Arts, Humanities & Social Sciences



# AHSS Year 1 Modules

## **HI4142 - GAMES OF THRONES: GENDER, POWER AND IDENTITY, IRELAND AND THE WIDER WORLD, 1500-1950**

ECTS Credits: 6 (Year 1 Module)

### History

**Rationale and Purpose of the Module:** *The module examines conflict, power and identity in Ireland, Europe and the wider world in the early modern and modern periods. Its purpose is to examine power and conflict in past societies, and the impact violence and unrest had for men and women, families, localities, states and continents. The module will introduce students to key concepts including gender, representations of power and identity.*

**Syllabus:** representations and realties of power: men and women; exercising power: religions, monarchies, dictatorships and institutions; violence; war and conflict; dynastic rivalry and conflict; local and agrarian unrest; the 'mob'; statecraft; diplomacy; heresy and censorship; ideology; subversion and non-violence; sexual politics and sectarianism.

## **JM4031 - SUB-EDITING AND DESIGN 1**

ECTS Credits: 6 (Year 1 Module)

### School of English, Irish and Communication

**Rationale and Purpose of the Module:** *This module aims to introduce students to key principles of sub-editing and design for journalism. It will develop students' theoretical understanding as well as skills and abilities by introducing them to the fundamentals of sub-editing practices including grammar, punctuation and syntax for news and feature journalism, for both print and online. It will also introduce students to the basic principles of news design using text and images for print and online.*

**Syllabus:** Students will use a stylebook to understand basic elements of text editing, proofreading and sub-

editing. They will learn the principles of professional editing, headline and standfirst writing, and cutting to length. They will be introduced to the basic principles of illustrating news, including taking photographs and generating graphics. They will learn print and website design and will create their own websites. They will analyse and compare design in national and local newspapers and websites, and will use these analyses to inform their own work. Assessment will be by sub-editing assignments, the production of a portfolio of work completed during the course, and a news website.

\*\*Please note that there are limited spaces for this module.\*\*

## **LA4002 - JURISPRUDENCE**

ECTS Credits: 6 (Year 1 Module)

### Law

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

**Syllabus:** Schools of jurisprudence: positivism, classical and modern. Kelsen's pure theory of law. Natural law theories. Historical and anthropological theories. Sociological jurisprudence. Legal realism. Marxist theories of law. Critical legal studies. Economic analyses. The operation of the law: precedent; statutory and constitutional interpretation. Theories of adjudication; Dworkin's rights thesis. Key legal concepts including theories of justice and Hohfeld's analysis. Key issues such as morality and the law and the duty to obey the law.

## **LA4012 - COMPARATIVE LEGAL SYSTEMS**

ECTS Credits: 6 (Year 1 Module)

### Law

**Rationale and Purpose of the Module:** *To show the evolution of some of the distinguishing features of the major legal families and to examine some alternatives offered by non-western cultures.*

**Syllabus:** The idea of law. Legal concepts. The historical development of common law. Early Irish law. Roman law. Civil law. Some fundamental concepts. German, French, Spanish and Scottish legal systems - introduction. How a Civil lawyer finds the law. American legal system. Other conceptions of law and the social order.

## **LA4032 - CRIMINAL PROCEDURE**

ECTS Credits: 6 (Year 1 Module)

### Law

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

**Syllabus:** Criminal Justice Models, Adversarial System, Jury Trials, Due Process, Classifications of Crime, Delay, An Garda Siochana, The Irish Courts/ Prisons, Police Powers, Stop and Search, Arrest & Detention, Questioning and Legal Representation, Bail, Prosecutions & Trial Procedure, Initiating Court Proceedings, Indictments, Arraignments and Pleas, Evidence & the Jury, the Special Criminal Court, Principles of Sentencing, Sentencing Options, Appeals, Miscarriages of Justice.

## **LA4042 - ADMINISTRATIVE LAW**

ECTS Credits: 6 (Year 1 Module)

### Law

**Rationale and Purpose of the Module:** *To provide students with the mechanisms to test whether any*

*decisions or actions taken by government or governmental agencies are lawful, and examine the redress available for aggrieved citizens.*

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

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#### **LA4082 - LAW OF EVIDENCE** ECTS Credits: 6 (Year 1 Module)

##### **Law**

**Rationale and Purpose of the Module:** *To critically examine the rules and general principles governing the admissibility of evidence in criminal trials.*

**Syllabus:** Principles of criminal evidence; burdens and standards of proof; witness testimony; confession evidence and illegally obtained evidence; expert evidence; corroboration; rule against hearsay; identification evidence; similar fact evidence; privilege.

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#### **LA4122 - CONTRACT LAW 2** ECTS Credits: 6 (Year 1 Module)

##### **Law**

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

**Syllabus:** Vitiating factors: mistake, misrepresentation, fraud, duress, undue influence, unconscionability. Discharge of obligations: by performance, by agreement, by breach, by frustration. Remedies for breach of contract: specific performance, damages, rectification, rescission. Assignment of contract obligations. Agency. Quasi-contracts.

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#### **LA4222 - CRIMINAL LAW 2** ECTS Credits: 6 (Year 1 Module)

##### **Law**

**Rationale and Purpose of the Module:** *By building on Criminal Law 1, to examine the principal criminal offences and elements of criminal procedure.*

**Syllabus:** Murder and manslaughter. Non-fatal offences against the person: assault and battery, aggravated assaults, false imprisonment. Sexual offences: rape, unlawful carnal knowledge of minors and others, sexual assault and aggravated sexual assault. Offences against property: arson, criminal damage, burglary, larceny, aggravated larcenies, robbery, obtaining by false pretences, embezzlement, fraudulent conversion, handling stolen property. Offences against the administration of justice: perjury, contempt of court. Offences against the public peace; Criminal Justice (Public Order) Act, 1994; criminal libel. Offences against the State; treason. Sentencing. Elements of criminal procedure: bail, extradition, and police powers.

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#### **LA4044 - LAW OF THE EUROPEAN UNION 2** ECTS Credits: 6 (Year 1 Module)

##### **Law**

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

**Syllabus:** The module covers, in the first instance, background to the single market/common market. The module proceeds to examine in detail the Four Freedoms: free movement of goods, the free movement of persons (including workers, families/dependents, students, retired citizens), the freedom of establishment

and the provision of services. Competition Law, including restrictive agreements and abuse of a dominant position will be examined. Social policy, (Equal pay and treatment, same sex couples, transsexuals etc.) will be covered and the module will end with a discussion on the impact of European Law on the animal welfare with specific reference to Treaty developments from the 1960s and the initial connection between animals and agriculture to recognition of the sentience of animals in the Treaty of Amsterdam and Lisbon, recent development including the Cat and Dog Fur Regulation and the Cosmetics Directive.

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#### **LA4320 - LAW OF TORTS 2** ECTS Credits: 6 (Year 1 Module)

##### **Law**

**Rationale and Purpose of the Module:** *To examine the tortious concepts of trespass, nuisance, defamation and economic torts. To evaluate remedies in the area of Tort Law and the assessment of damages.*

**Syllabus:** Trespass to the person, land and goods. Nuisance. Rylands v Fletcher liability. Damage by fire. Defamation. Economic torts: deceit, passing off, injurious falsehood, inducement to breach of contract, conspiracy. Remedies: general and special, judicial and extra-judicial, assessment of damages. Limitation of actions.

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#### **LA4440 - CONSTITUTIONAL LAW 2** ECTS Credits: 6 (Year 1 Module)

##### **Law**

**Rationale and Purpose of the Module:** *Currently, the School of Law delivers lectures on the Irish Constitution to all our LLB degrees and to a number of FAHSS courses. These modules are entitled Public Law 1 and Public Law 2. The term Public Law is outdated and cumbersome. The two new modules being created will keep the content of the Public Law modules but will use the more commonly used name of Constitutional Law. It*

*will be to the advantage of students, and professional bodies and employers with which they deal, as the term Constitutional Law bears the more commonly used term for the study of this area of law.*

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

#### **LA4540 - COMPANY LAW 2** ECTS Credits: 6 (Year 1 Module)

##### **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 Law of Business Associations modules but will use the more commonly used name of Company Law. It will be to the advantage of students, and professional bodies and employers with which they deal, as the term Company Law bears the more commonly used term for the study of this area of law.*

**Syllabus:** The module covers the administration of companies insofar as topics covered include; the, appointment, role and duties of Directors, the role and duties of the Company Secretary and the Annual return obligations of companies. The module also covers issues of dividends and the company law limitations on profit distributions. In addition, the module covers the various methods of enforcement of company law. The consequences of a companys secured borrowings are also considered in terms of the secured party enforcing security by appointment of a receiver. The statutory scheme and facility of examinership for a company in financial difficulty is reviewed and the duties of court appointed examiners analysed. Finally, the module covers the various methods of winding up of companies and the roles of different types of liquidators. The duties of liquidators are examined and the connections between those duties and the schemes and bodies of company law enforcement are reviewed.

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#### **LA4620 - LAND LAW 2** ECTS Credits: 6 (Year 1 Module)

##### **Law**

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

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

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#### **LA4922 - SPORT AND THE LAW** ECTS Credits: 6 (Year 1 Module)

##### **Law**

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

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

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#### **ES4002 - EUROPEAN STUDIES WORKSHOP** ECTS Credits: 6 (Year 1 Module)

##### **School of Modern Languages and Applied Linguistics**

**Rationale and Purpose of the Module:** *The module*

*takes the form of a workshop with a strong practical focus. It has a four-fold purpose:*

- 1 Consolidating the sense of Course identity among European Studies students.*
- 2 Providing an opportunity for students to discuss the application of their theoretical knowledge about the European Union with practitioners, experts and politicians in areas where Ireland's EU membership has a vital impact.*
- 3 Providing students with space to explore the complexities of EU decision-making in simulation games.*
- 4 For teaching-staff the module provides a space for experimenting with the innovative ways to teach European (Union) Studies.*

**Syllabus:** The proposed syllabus remains open and flexible but will contain two distinct elements of six weeks each, though not necessarily in separate blocks:

- 1. Guest-speakers:** Three speakers will be invited from fields in which Ireland's membership of the European Union is of central importance. These are also likely to be the areas in which European Studies graduates may find employment. Speakers can be proposed by all disciplines participating in the degree programme. They may include staff of the European Parliament Representation or the European Commission Representation in Dublin, MEPs, senior civil servants interested in EU affairs, politicians active in parliamentary committees with a strong EU focus, civil society organizations such as the European Movement, trade unions, EU translators and interpreters, companies with a strong international orientation or trade links with other EU countries, international legal firms, journalists etc. Each visit will be thoroughly prepared beforehand and the work context of the speaker will be explored. This will allow the students to make more effective use of guest speakers than is normally the case.
- 2. EU Negotiation Simulation Games:** The other half of the module will be dedicated to an EU negotiation simulation exercise which will take account of topical issues. These can take the forms of a European Parliament debate, interactions which occur within and between the European Parliament, the European Commission and the Council of Ministers during the process of drawing up EU legislation, discussions among representations of regional interests and inter-regional cooperation etc. There are a number models and

guidelines for such exercises available; some are listed in the resources below. In preparatory sessions students will be enabled to formulate the policy stances of different member states, parties, interest/lobby groups etc. This will require independent research for which students are strongly encouraged to make use of their language skills. Through such simulation exercises, students will gain formal knowledge of the process and techniques of negotiation and decision-making in the EU. In addition, they learn how other factors can affect outcomes, including time pressure, informal discussions that take place on the margins, personalities, negotiating strategies, negotiating languages etc.

The module may incorporate a visit to Brussels.

The relative openness and flexibility of this workshop module also provides the space for interaction with incoming ERASMUS students who may wish to participate as well as for joint projects with our ERASMUS partner institutions involved in teaching European Studies. Exploratory discussions about such collaborations are currently under way.

Students will have to write a report of the simulation exercise as well as a research essay on a topic of their choice.

*Prerequisites: ES4001*

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**FR4142 - FRENCH LANGUAGE AND SOCIETY 2:  
INTRODUCTION TO FRE**  
*ECTS Credits: 6 (Year 1 Module)*

**School of Modern Languages and Applied  
Linguistics**

**Rationale and Purpose of the Module:** *This module is set at B1+ on the Common European Framework of Reference for Languages (CEFR).*

- (i) To review key aspects of contemporary Francophone societies;
- (ii) to continue to develop students receptive and active language skills;
- (iii) to consolidate students knowledge of French grammar;
- (iv) to reinforce students awareness of issues related to the evolution of the French language and in particular

*regional varieties and la Francophonie;  
(v) to promote students reading and analytical skills in the study of French literature.*

**Syllabus:** This syllabus is set at B1+ on the Common European Framework of Reference for Languages (CEFR). Students are introduced in lectures to the study of social, historical, linguistic and literary aspects of France and francophone societies. Themes presented this semester are

- (i) decolonisation and the variety of francophone communities;
- (ii) the search for identity in modern literature;
- (iii) la Francophonie and regional varieties of language.

Tutorials explore these subjects and students reading and writing skills are improved through regular exercises. Particular attention is paid to oral and aural skills in French which are developed through the discussion of a broad selection of contemporary oral and written texts from diverse media. Students continue to review issues related to French grammar.

*Prerequisites: FR4141*

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**FR4242 - FRENCH LANGUAGE, CULTURE AND  
SOCIETY 2A**  
*ECTS Credits: 6 (Year 1 Module)*

**School of Modern Languages and Applied  
Linguistics**

**Rationale and Purpose of the Module:** *This module is set at B1+ on the Common European Framework of Reference for Languages (CEFR).*

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

**Syllabus:** This syllabus is set at B1+ on the Common European Framework of Reference for Languages (CEFR). Students are introduced in lectures to the study of social, historical, linguistic and literary aspects of France and francophone societies. Themes explored this semester are

- (i) decolonisation and the variety of francophone communities
- (ii) the search for identity in modern literature
- (iii) la Francophonie and regional varieties of language.

These topics are discussed in depth in the more active setting of weekly tutorials. Oral and aural skills in French are a particular focus, and they are developed through the discussion of a broad selection of oral and written material from diverse media. The study of French grammar in semester 1 is continued.

*Prerequisites: FR4241*

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**FR4622 - LITERATURE AND CULTURE 2:  
TWENTIETH-CENTURY LITERATURE IN FRANCE**  
*ECTS Credits: 6 (Year 1 Module)*

**School of Modern Languages and Applied  
Linguistics**

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

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

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

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

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**FR4922 - FRENCH FOR BUSINESS 2A**  
*ECTS Credits: 6 (Year 1 Module)*

**School of Modern Languages and Applied  
Linguistics**

**Rationale and Purpose of the Module:** This module is set at B1 on the Common European Framework of Reference for Languages (CEFR).

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

**Syllabus:** This syllabus is set at B1 on the Common European Framework of Reference for Languages (CEFR).

Students are introduced to the detailed study of social, historical, linguistic and literary aspects of France and la Francophonie.

Themes presented this semester are

- (i) decolonisation and the variety of francophone communities
  - (ii) the search for identity in modern literature and
  - (iii) la Francophonie and regional varieties of language.
- Oral and aural skills in French are further improved through the discussion of a broad selection of contemporary oral and written texts from diverse media. With the use of authentic material (both written and oral) and with a variety of linguistic activities simulating a business environment students are asked to deal competently with tasks encountered in specific situations. The areas of focus include: finance, accounts, and investments. Students also study a literary text related to one of the lecture themes. The study of French grammar -in semester 1- is continued.

Prerequisites: FR4921

#### GE4142 - GERMAN LANGUAGE AND SOCIETY 2: INTOD GERMAN STUD II

ECTS Credits: 6 (Year 1 Module)

**School of Modern Languages and Applied Linguistics**

**Rationale and Purpose of the Module:** This module is set at B1 on the Common European Framework of Reference for Languages (CEFR).

To give an overview over major trends in German culture and society from 1945 to today by means of texts and

visual material.

To introduce aspects of social and regional variation in the German language. To continue introduction to the analysis of literary texts in German.

To conclude the revision of grammatical structures enabling students to use them with a high degree of fluency and correctness.

**Syllabus:** This syllabus is set at B1 on the Common European Framework of Reference for Languages (CEFR).

Lecture: Postwar German-speaking countries: society and institutions; political, economic, cultural and literary trends; contemporary literature and culture in the German-speaking countries of Europe.

Tutorials: a) analysis of literary texts to provide further access to the topics discussed in the lecture while at the same time further developing reading techniques, principles of textual analysis and text discussion in oral and written form; b) Contrastive grammar work continued. Language laboratory: exercises in pronunciation, listening comprehension and grammar utilizing CALL facilities.

Prerequisites: GE4141

#### GE4212 - GERMAN FOR BEGINNERS 2 (APPLIED LANGUAGES)

ECTS Credits: 6 (Year 1 Module)

**School of Modern Languages and Applied Linguistics**

**Rationale and Purpose of the Module:** This module is set at A1/A2 on the Common European Framework of Reference for Languages (CEFR).

This module aims to:

To give an overview of major trends in German culture and society in the post-war period.

To consolidate and develop basic communicative skills acquired in GE4211

To introduce further basic grammatical structures/functions and consolidate those covered in previous module.

**Syllabus:** This syllabus is set at A1/A2 on the Common European Framework of Reference for Languages (CEFR).

Lecture: Postwar German-speaking countries: society and institutions; political, economic, cultural and literary trends; contemporary literature and culture in the German-speaking countries of Europe.

Tutorials: The course builds on GE4211, introducing further grammatical structures, functions and vocabulary. Development of all four language skills in the classroom and laboratories. Transfer of known structures to a variety of communicative contexts. Further guidance will be given to students on how best to develop self-study skills to reinforce material covered during the course. One tutorial provides an introduction to German drama and further short stories.

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

Prerequisites: GE4211

#### GE4242 - GERMAN LANGUAGE, CULTURE AND SOCIETY 2A

ECTS Credits: 6 (Year 1 Module)

**School of Modern Languages and Applied Linguistics**

**Rationale and Purpose of the Module:** This module is set at B1 on the Common European Framework of Reference for Languages (CEFR).

To further develop student awareness of political structures and to provide an understanding of German-speaking countries as economic and industrial entities; to continue development and consolidation of communicative skills; to develop autonomous language learning methods. Continued emphasis 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:** This syllabus is set at B1 on the Common European Framework of Reference for Languages (CEFR).

Lecture: Postwar German-speaking countries: society and institutions; political, economic, cultural and literary trends; contemporary literature and culture in the German-speaking countries of Europe.

Tutorial work: one hour textwork develops skills relating to textual analysis, grammar in use and writing, literary

texts relating to lectures will also be discussed in this class and examined in the oral and written exams; one hour grammar/translation consolidates existing grammatical knowledge and introduces more complex structures through contrastive work using English/German translation exercises; German linguistics relates general linguistic course to the German situation, focusing on past and current developments in the German language.

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**GE4622 - GERMAN LITERATURE AND CULTURE 2:  
TEXT, WRITER AND READER**  
ECTS Credits: 6 (Year 1 Module)

**School of Modern Languages and Applied  
Linguistics**

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

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

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**GE4922 - GERMAN FOR BUSINESS 2A**  
ECTS Credits: 6 (Year 1 Module)

**School of Modern Languages and Applied  
Linguistics**

**Rationale and Purpose of the Module:** *This module is set at B1 on the Common European Framework of Reference for Languages (CEFR). To continue the business German foundation provided in Semester 1. To continue to provide an insight into socio-economic and political structures in Germany and to develop students' familiarity with German culture. To equip students with the linguistic skills necessary to deal with business situations. To familiarise students with organisational structures of German firms.*

**Syllabus:** This syllabus is set at B1 on the Common European Framework of Reference for Languages (CEFR). Lecture: Postwar German-speaking countries: society and institutions; political, economic, cultural and literary trends; contemporary literature and culture in the German-speaking countries of Europe. Tutorials: a) analysis of literary texts to provide further access to the topics discussed in the lecture while at the same time further developing reading techniques, principles of textual analysis and text discussion in oral and written form; b) introduction to firm structures in Germany; induction in telephone techniques and other work-related interactive skills Language laboratory: exercises in pronunciation, listening comprehension and grammar utilizing CALL facilities

Prerequisites: GE4921

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**JA4112 - JAPANESE LANGUAGE, CULTURE AND  
SOCIETY 2 (ADVANCED)**  
ECTS Credits: 6 (Year 1 Module)

**School of Modern Languages and Applied  
Linguistics**

**Rationale and Purpose of the Module:** *To give an overview of Japanese culture and society from 1945 to today by means of texts and visual material. To conclude the revision of grammatical structures and kanji enabling students to use them with a high degree of fluency and correctness.*

**Syllabus:** Lecture: Japanese history, society and institutions; Tutorials: a) analysis of literary and other texts to provide further access to the topics discussed in the lecture while at the same time further developing reading techniques; b) Grammar work continued, listening comprehension. Autonomous Project work utilizing CALL facilities.

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**JA4212 - JAPANESE LANGUAGE, CULTURE AND  
SOCIETY 2**  
ECTS Credits: 6 (Year 1 Module)

**School of Modern Languages and Applied**

**Linguistics**

**Rationale and Purpose of the Module:** *This module is set at A2 on the Common European Framework of Reference for Languages (CEFR). To give an overview of Japanese culture and society from 1945 to today by means of texts and visual material. To conclude the revision of grammatical structures and kanji enabling students to use them with a high degree of fluency and correctness.*

**Syllabus:** This syllabus is set at A2 on the Common European Framework of Reference for Languages (CEFR). Lecture: Japanese history, society and institutions; Tutorials: a) analysis of literary and other texts to provide further access to the topics discussed in the lecture while at the same time further developing reading techniques; b) Grammar work continued, listening comprehension. Autonomous Project work utilizing CALL facilities.

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**JA4222 - JAPANESE READING AND TRANSLATION**  
ECTS Credits: 6 (Year 1 Module)

**School of Modern Languages and Applied  
Linguistics**

**Rationale and Purpose of the Module:** *To develop skills in reading longer texts in Japanese: in the areas of culture, current affairs and some short stories. To do initial work in translating various types of short passages from Japanese to English.*

**Syllabus:** Lecture: Work on the structure of kanji as a means of achieving faster acquisition and greater learner autonomy; sources of Japanese texts, particularly on the web; introduction to web-based aids to reading in Japanese; characteristics of Japanese as a Source Language in translation. Tutorial work: One tutorial will deal with reading (particularly techniques for faster reading), the second with English to Japanese translation of a variety of short texts.

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**JA4912 - JAPANESE FOR BUSINESS 2**  
ECTS Credits: 6 (Year 1 Module)

## School of Modern Languages and Applied Linguistics

**Rationale and Purpose of the Module:** This module is set at A2 on the Common European Framework of Reference for Languages (CEFR). To consolidate and increase abilities already gained in understanding, speaking, reading and writing, and further students' understanding of Japanese society, as well as to develop further strategies for autonomous language learning.

**Syllabus:** This syllabus is set at A2 on the Common European Framework of Reference for Languages (CEFR).

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

**Prerequisites:** JA4911

### LI4001 - PEER TUTORING FOR LANGUAGES

ECTS Credits: 3 (Year 1 Module)

## School of Modern Languages and Applied Linguistics

**Rationale and Purpose of the Module:** This module aims to provide students who are native speakers of a language other than English which is taught in the School of Languages, Literature, Culture and Communication (hereafter referred to as LOTE students) with the appropriate training, guidance and support to effectively facilitate optional peer-led discussion groups or one-to-one sessions in the target language for UL language learners of French, German, Irish, Japanese and Spanish. It also aims to provide the LOTE students with transferable knowledge and skills which will be of use to them in their future careers and in their own language

learning.

This module mainstreams a project which has been very successfully running with AHSS Faculty Development Teaching Fund since September 2012. In AY 2012-13, 19 LOTE students were trained as peer tutors and 133 hours of additional language practice were provided. Substantially more hours are being provided in AY 2013-14 (32 peer tutors have enrolled in the Autumn Semester).

Practising the language is paramount in achieving fluency and accuracy, and yet language studies programmes within Higher Education are understandably limited in the amount of focused language practice they can offer. This module aims, therefore, also to address this issue by providing multilingual peer tutoring in a systematic manner, parallel to existing language studies modules. Consequently, the module equally provides additional benefit in supporting all UL language students participating in the discussion groups and/or one-to-one sessions.

**Syllabus:** This module will prepare LOTE students to facilitate peer-led discussion groups and one-to-one sessions in their native language. It will particularly focus on the following aspects:

- The role of a facilitator of a discussion group or one-to-one session
- The difference between teaching a language class and facilitating a discussion group or one-to-one session
- The skills and techniques necessary to break the ice within a group or in a one-to-one session
- The feedback which it is appropriate to give to attendees (grammar, vocabulary, pronunciation, register, etc.)
- The role of attendees' language-learning background
- Relevant topics for the discussion-group sessions and one-to-one sessions
- Communication issues which may arise (e.g. cultural differences)
- Key communication strategies necessary to encourage participation in a discussion group
- The main linguistic pitfalls for language learners
- The nature and role of a reflective portfolio.

### LI4212 - LINGUISTICS 2

ECTS Credits: 6 (Year 1 Module)

## School of Modern Languages and Applied Linguistics

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

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

**Syllabus:** The module comprises four distinct but also interrelated themes, each of which will be dealt with in sequential blocks over the twelve week module:

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

**Prerequisites:** LI4211

### SP4002 - INTRODUCTION TO LATIN AMERICAN CULTURE/S

ECTS Credits: 6 (Year 1 Module)

## School of Modern Languages and Applied Linguistics

**Rationale and Purpose of the Module:** First year students majoring in Spanish need to have a general but solid knowledge of the main socio-political processes in Latin American history and their effects on and interaction with literary and film production, as well as other forms of culture, as background for further modules and as part of their overall achievement within

this programme.

**Syllabus:** The development of Latin American culture has been marked by its multicultural and multi-ethnic history. The arrival of the Spanish Conquistadors had a massive effect in Latin American cultures and civilizations. From 1492 onwards, the construction of Latin American identities are characterised by the encounter and interaction of indigenous and African cultures and the influence of the Hispanic tradition. In order to explore the development of Latin American culture, the module will pay special attention to a number of themes, from the Amerindian civilizations to the literary boom of the 1960s, Magical Realism, and the importance of women's artistic production.

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#### **SO5032 - QUANTITATIVE RESEARCH METHODS 2**

ECTS Credits: 9 (Year 1 Module)

#### **Sociology**

**Rationale and Purpose of the Module:** The purpose of this course is to take students with a basic knowledge of quantitative methods and to familiarise them with the more advanced tools needed for practical quantitative social research. The course has two focuses: statistical techniques appropriate to social science research and the practice of large-scale survey research. It is intended that students acquire a degree of practical competence with the sorts of statistical thinking and technique needed for real-world social research, and a familiarity with analysis of survey data to answer real life research questions. A core aspect of the course will be extensive work with large-scale survey data sets, including longitudinal and comparative.

**Syllabus:** The purpose of this course is to take students with a basic knowledge of quantitative methods and to familiarise them with the more advanced tools needed for practical quantitative social research. The course has two focuses: statistical techniques appropriate to social science research and the practice of large-scale survey research. It is intended that students acquire a degree of practical competence with the sorts of statistical thinking and technique needed for real-world social research, and a familiarity with analysis of survey data to answer real life research questions. A core aspect of the course will be extensive work with large-scale survey data sets, including longitudinal and comparative.

Prerequisites: SO5041

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#### **SP4132 - SPANISH FOR BEGINNERS 2**

ECTS Credits: 6 (Year 1 Module)

#### **School of Modern Languages and Applied Linguistics**

**Rationale and Purpose of the Module:** This module is set at A1/A2 on the Common European Framework of Reference for Languages (CEFR).

The beginners course aims to provide the student with a strong basic knowledge of Spanish and of contemporary Spain and Latin America.

The course is designed to:

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

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

To foster autonomous language learning skills.

To introduce the student to Spanish and Latin American cultures.

To develop listening and speaking skills in Spanish.

To equip the student with basic writing skills.

**Syllabus:** This syllabus is set at A1/A2 on the Common European Framework of Reference for Languages (CEFR). Lecture: introduction to contemporary Spanish and Latin American cultures and societies.

These include: transculturation and indigenous cultures in Latin America; contemporary Spanish and Latin American literature, basic concepts of Spanish linguistics. Tutorials and lab: working with set text-book, back-up audio-visual and online materials, students are introduced to past tenses, pronominal verbs and more complex structures in the Spanish language.

Prerequisites: SP4131

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#### **SP4142 - SPANISH LANGUAGE AND SOCIETY 2**

ECTS Credits: 6 (Year 1 Module)

#### **School of Modern Languages and Applied Linguistics**

**Rationale and Purpose of the Module:** This module is set at B1 on the Common European Framework of Reference for Languages (CEFR).

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:** This syllabus is set at B1 on the Common European Framework of Reference for Languages (CEFR).

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.

Prerequisites: SP4141

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#### **SP4152 - SPANISH FOR BUSINESS 2 (BEGINNERS)**

ECTS Credits: 6 (Year 1 Module)

#### **School of Modern Languages and Applied Linguistics**

**Rationale and Purpose of the Module:**

This module is set at A1/A2 on the Common European Framework of Reference for Languages (CEFR).

The beginners module aims to provide the student with a strong basic knowledge of Spanish and of contemporary

*Spain and Latin America, particularly as regards the economic and commercial dimensions. The module is designed to: Enable the student to understand and use basic structures of Spanish grammar. Expose the student to a range of vocabulary and expressions which will allow her/him to present her/himself to, and communicate with native speakers of Spanish. To foster autonomous language learning skills. To introduce the student to Spanish and Latin American cultures. To develop listening and speaking skills in Spanish. To equip the student with basic writing skills.*

**Syllabus:**

This module is set at A1/A2 on the Common European Framework of Reference for Languages (CEFR).

The main areas of grammar covered are: impersonal hay; hay versus estar; present indicative of ir and saber; o-ue, e-i and e-ie radical changes; basic prepositions of place; comparatives and superlatives; impersonal gustar; further irregular verb patterns; development of ser/estar distinction; con with personal pronouns; indirect object pronouns.

The main areas of phonology covered are: reinforcement of the vowel and consonant systems and basic word stress patterns.

The above are complemented by communicative, lexical and oral and written skills syllabi included in a textbook which will be chosen according to the range of availability at the relevant point in time. An example of the latter would be units 1-4 of the textbook Socios, the details of which are described at:  
[https://www.difusion.com/uploads/telechargements/catalogue/ele/socios/socios1\\_LA\\_muestra.pdf](https://www.difusion.com/uploads/telechargements/catalogue/ele/socios/socios1_LA_muestra.pdf)

*Prerequisites: SP4151*

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**SP4162 - SPANISH FOR BUSINESS 2**

*ECTS Credits: 6 (Year 1 Module)*

**School of Modern Languages and Applied Linguistics**

**Rationale and Purpose of the Module:** *This module is set at B1 on the Common European Framework of Reference for Languages (CEFR).*

*To develop students' understanding of key aspects of contemporary Hispanic societies. To further develop practical language skills (receptive and active). To reinforce and extend students' knowledge of Spanish vocabulary and grammar. To consolidate students' Business Spanish acquired in Semester one. To enhance students' reading and analytical skills in the study of Spanish textual material.*

**Syllabus:** This module is set at B1 on the Common European Framework of Reference for Languages (CEFR).

The main areas of grammar covered are: discourse markers and other cohesive devices; nature, position and combinations of object pronouns; pluscuamperfecto tense; (non)finite verbs in temporal phrases;

The main areas of phonology covered are: reinforcement of the vowel and consonant systems and basic word stress patterns.

The above are complemented by communicative, lexical and oral and written skills syllabi included in a textbook which will be chosen according to the range of availability at the relevant point in time. An example of the latter would be units 4-7 of the textbook Expertos. These include areas such as: the lexis of international business; presenting oral reports; marketing materials and the lexis of entrepreneurship; the lexis of the stock exchange; writing summaries; the lexis of work/life balance. The details of these syllabi are described at:  
<https://www.difusion.com/catalogo/metodos/profesional/expertos/expertos-libro-del-profesor>

*Prerequisites: SP4161*

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**SP4232 - SPANISH LANGUAGE,CULTURE AND SOCIETY 2 (BEGINNERS)**

*ECTS Credits: 6 (Year 1 Module)*

**School of Modern Languages and Applied Linguistics**

**Rationale and Purpose of the Module:** *This module is set at A1/A2 on the Common European Framework of Reference for Languages (CEFR).*  
*The beginners course aims to provide the student with a*

*strong basic knowledge of Spanish and of contemporary Spain and Latin America.*

*The course is designed to:*  
*Enable the student to understand and use basic structures of Spanish grammar.*

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

*To foster autonomous language learning skills.*  
*To introduce the student to Spanish and Latin American cultures.*  
*To develop listening and speaking skills in Spanish.*  
*To equip the student with basic writing skills.*

**Syllabus:** This syllabus is set at A1/A2 on the Common European Framework of Reference for Languages (CEFR).

Lecture: introduction to contemporary Spanish and Latin American cultures and societies.  
 These include: transculturation and indigenous cultures in Latin America; contemporary Spanish and Latin American literature, basic concepts of Spanish linguistics. Tutorials and lab: working with set text-book, back-up audio-visual an online materials, students are introduced to past tenses, pronominal verbs and more complex structures in the Spanish language.

*Prerequisites: SP4231*

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**SP4242 - SPANISH LANGUAGE, CULTURE AND SOCIETY 2A**

*ECTS Credits: 6 (Year 1 Module)*

**School of Modern Languages and Applied Linguistics**

**Rationale and Purpose of the Module:** *This module is set at B1 on the Common European Framework of Reference for Languages (CEFR).*

*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:** This syllabus is set at B1 on the Common European Framework of Reference for Languages (CEFR).

The advanced course consists of four hours of Spanish per week:

- Two language tutorials (grammar, vocabulary, communication skills, writing and reading skills).
- One laboratory/oral class (oral communication skills).
- One General Lecture

**Prerequisites:** SP4241

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#### SP4622 - INGENIOSM AND NEGRISMO IN LATIN AMERICA LITERATURE

ECTS Credits: 6 (Year 1 Module)

#### School of Modern Languages and Applied Linguistics

##### Rationale and Purpose of the Module: Aims & Objectives:

*To analyse Latin American literature from the marginalised perspective of two distinct ethnic groups as a way of examining the authenticity and specificity of Latin American peoples and their literature. To broaden and enrich students' critical thinking by exposing them to issues closely related to the quest for human rights and freedom of marginal groups in Latin America.*

**Syllabus:** Students will analyse poetry, novels and testimonies by/about black and indigenous populations to include some of the following: Alcides Arguedas (Bolivia), Jorge Icaza and Adalberto Ortiz (Ecuador), Miguel Angel Asturias (Guatemala), José María Arguedas, Enrique López Albajar and Nicolás Santa Cruz (Per.), Lydia Cabrera and Manuel Cofiño (Cuba) among others.

**Prerequisites:** SP4003

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#### TE4012 - ENGLISH AS A FOREIGN LANGUAGE 2 (INTERMEDIATE)

ECTS Credits: 6 (Year 1 Module)

#### School of Modern Languages and Applied Linguistics

**Rationale and Purpose of the Module:** This module is set at B1+ on the Common European Framework of Reference for Languages (CEFR).

*To provide language support to students on the Erasmus exchange programmes to enable them to benefit more fully from their Erasmus experience at a social, cultural and academic level.*

*To provide integrated tuition and practice in the four language skills of listening, speaking, reading and writing.*

**Syllabus:** This syllabus is set at B1+ on the Common European Framework of Reference for Languages (CEFR).

Students work from a set text book, back-up audio visual and on-line material.

Practice is given in the four language skills, language awareness-raising and with special emphasis on pronunciation at this level.

The following grammatical areas are covered: second and third conditionals, passive voice, gerunds and infinitives, reported statements, reported questions and commands, quantifiers, articles

lexis e.g. phrasal verbs, strong adjectives, ed/ing adjectives, some uses of get, noun formation, compound nouns, frequent collocations, common expressions, conversational responses and idioms, discourse markers (oral and written) e.g. connectives, sequencing, signposting.

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#### TE4022 - ENGLISH AS A FOREIGN LANGUAGE 2 (UPPER INTERMEDIATE)

ECTS Credits: 6 (Year 1 Module)

#### School of Modern Languages and Applied Linguistics

**Rationale and Purpose of the Module:** This module is set at B2+ on the Common European Framework of Reference for Languages (CEFR).

*To provide language support to students on the Erasmus exchange programmes to enable them to benefit more fully from their Erasmus experience at a social, cultural and academic level.*

*To provide integrated tuition and practice in the four*

*language skills of listening, speaking, reading and writing.*

**Syllabus:** This syllabus is set at B2+ on the Common European Framework of Reference for Languages (CEFR).

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: adjective order, hypothetical time, countability and plural nouns, quantifiers, gerund or infinitive after verbs, clauses of contrast, clauses of purpose and reason, reporting verbs, use of the passive, as/like

Lexis: wordbuilding, homonyms, frequent collocations, common expressions, conversational responses and idioms, discourse markers (oral and written) e.g. connectives, sequencing, signposting.

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#### TE4032 - ENGLISH AS A FOREIGN LANGUAGE 2 (ADVANCED)

ECTS Credits: 6 (Year 1 Module)

#### School of Modern Languages and Applied Linguistics

**Rationale and Purpose of the Module:** This module is set at C1 on the Common European Framework of Reference for Languages (CEFR).

*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:** This syllabus is set at C1 on the Common European Framework of Reference for Languages (CEFR).

Students work from a set text book, back-up audio visual and on-line material.

Integrated tuition and practice is given in the four language skills.

The following areas are covered: grammar; future forms, wishes and regrets, defining and non-defining relative clauses, noun clauses, adverb clauses, perfective v progressive aspect, gerunds, infinitives

Lexis: discourse markers, phrasal verbs, collocations, British v American English

### **PA4022 - INTRODUCTION TO PUBLIC ADMINISTRATION II**

ECTS Credits: 6 (Year 1 Module)

#### **Politics and Public Admin**

**Rationale and Purpose of the Module:** Awareness of different systems is essential for explanation, theory and practice in Public Administration. This module explores how new national and international realities shape administrative practices and systems and draws on examples from throughout the world. It examines public service systems in different contexts, the roles and functions they fulfill and the administrative traditions that shaped them. It explores how common administrative problems are dealt with and the processes used to deal with contemporary challenges. It also identifies trends in public sector reform and the role of international institutions, such as the OECD, in promoting public sector modernization.

This module will be offered on the new BA Arts programme.

Pre-requisite module for this modules is Module ID 1548 Introduction to Public Administration I.

**Syllabus:** &bull; Major functions of the modern democratic state  
 &bull; Postmodern public management  
 &bull; Organizing the civil and public service - different approaches, different roles  
 &bull; Structures, processes and institutions in different contexts  
 &bull; Coordination of public policy and administration - towards joined-up government  
 &bull; Links between administrative and political systems  
 &bull; Decentralization, devolution and the hollowing out of the State  
 &bull; Reform trends  
 &bull; The influence of supranational organisations  
 &bull; Contemporary Issues in public administration e.g., the challenges and potential of technology for public service systems ; accountability; gender; ethics

*Prerequisites: PA4001*

### **PO4052 - INTRODUCTION TO POLITICS AND INTERNATIONAL RELATIONS II**

ECTS Credits: 6 (Year 1 Module)

#### **Politics and Public Admin**

**Rationale and Purpose of the Module:** This module will further introduce students to the study of Politics and International Relations. It will do so by comparing different regime types; by exploring the concepts of democracy, freedom and justice; and by exploring issues in international politics, such as war, terrorism, inequality and development. This module will be offered on the Evening Degree.

**Syllabus:** Democracy and Democratization  
 Authoritarianism and Totalitarianism  
 Arguments for and against Democracy  
 Freedom and Rights  
 Theories of Justice  
 War and Terrorism  
 Inequality and Development

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

ECTS Credits: 6 (Year 1 Module)

#### **Politics and Public Admin**

**Rationale and Purpose of the Module:** This module will develop students knowledge of research and methods by introducing them to theory building, research design, and methods of data collection and analysis.

**Syllabus:** 1. The Scientific Study of Politics  
 2. Theory Building  
 3. Evaluating Causal Relationships  
 4. Research Design  
 5. Measurement  
 6. Descriptive Statistics and Graphs  
 7. Statistical Inference  
 8. Bivariate Analysis  
 9. Bivariate Regression Analysis  
 10. Multiple Regression Analysis

### **PO4112 - INTRODUCTION TO POLITICS AND INTERNATIONAL RELATIONS II**

ECTS Credits: 6 (Year 1 Module)

#### **Politics and Public Admin**

**Rationale and Purpose of the Module:** This module will further introduce students to the study of Politics and International Relations. It will do so by comparing different regime types; by exploring the concepts of democracy, freedom and justice; and by exploring issues in international politics, such as war, terrorism, inequality and development. This module will be offered on the Evening Degree.

**Syllabus:** Democracy and Democratization  
 Authoritarianism and Totalitarianism  
 Arguments for and against Democracy  
 Freedom and Rights  
 Theories of Justice  
 War and Terrorism  
 Inequality and Development

### **SO4002 - GENDER: SOCIOLOGICAL PERSPECTIVES**

ECTS Credits: 6 (Year 1 Module)

#### **Sociology**

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

**Syllabus:** This module equips students with a critical understanding of key concepts in gender studies and feminist thought and how these are informed by, and inform, sociological enquiry. It offers an introduction to the main sociological perspectives on gender; key debates in feminist theory; debates in the study of masculinity; and perspectives on substantive topics such as work and care in the context of these frameworks. The module also examines the operation of gender divisions across national and transnational social contexts and their articulation with other major social divisions such as class, sexuality, ethnicity and race.

### **SO4032 - INTRODUCTION TO SOCIOLOGY 2**

ECTS Credits: 6 (Year 1 Module)

### Sociology

**Rationale and Purpose of the Module:** This module aims to better acquaint students with the discipline and field of sociology, including the work of contemporary sociologists, and to provide them with strong foundation of knowledge in preparation for further sociology modules.

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. Finally, this module also seeks to promote valuable skills in critical thinking, writing, referencing, and research.

**Syllabus:** An introduction to deviance, crime and control.

Crime Statistics

Sociological approaches to explaining crime

Sanctions

Prison

Concepts of race and ethnicity

Manifestations of diversity

Representations of race and ethnicity in the media.

Racism and public attitudes towards cultural diversity, minorities and immigrants

An introduction to the sociology of religion

Secularisation

Civil Religion and Invisible religion

Social class

The continuing relevance of class

Class, consumption and identity

Class, cultural capital and consumption

opportunity to engage in learning German. 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 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:

- &bull; manage to pronounce very short, isolated mainly ready-made expressions;
- &bull; show a limited control of a few simple grammatical structures;
- &bull; use a very basic repertoire of words related to personal details;
- &bull; use a limited range of vocabulary to talk about particular concrete situations;
- &bull; use a small range of ready-made expressions and phrases related to everyday topics (introductions, leave-taking, apologies);
- &bull; write simple isolated phrases and sentences on everyday topics.

### JM4013 - RADIO JOURNALISM

ECTS Credits: 6 (Year 2 Module)

### School of English, Irish and Communication

**Rationale and Purpose of the Module:** This module is being created to introduce radio journalism to the BA

Journalism and New Media degree program, following recommendations by the external examiner and feedback from industry.

**Syllabus:** The module will examine historical perspectives on the medium of radio and the current organisational structures of radio in Ireland and internationally. The impact of broadcast journalism on democracy will be examined. Areas such as podcasting and on-line streaming, and their impact on news media and on democracy will also be explored. Lectures will also examine radio research techniques, interviewing for audio and on scriptwriting for the ear. Practical classes will focus on the development of skills for professional journalism practice for audio-based outputs, and will take place in studio and in a dedicated newsroom. Writing and presentation skills for radio, microphone technique, voice training, audio mixer operation, telephone recording procedures, the operation of portable recording devices and computer-based editing of audio reportage will be examined.

\*\*Please note that there are limited numbers for the module\*\*

### JM4024 - SPORTS JOURNALISM

ECTS Credits: 6 (Year 2 Module)

### School of English, Irish and Communication

**Rationale and Purpose of the Module:** This module will provide students with the opportunity to develop their reporting, writing and broadcast skills in sports journalism. It will explore the principles and practice of good sports journalism and develop students analytical skills and critical awareness of the role of sport in newspapers, online, magazines and broadcast organisations.

**Syllabus:** This module will give students practical experience in producing sports journalism for print and broadcast. Students will develop a rounded understanding of the processes involved in producing journalism content for sport. The significance of sports journalism within the overall newspaper, online and broadcast bulletin will be set in context. Additionally, students will conduct weekly field reports and work in their own time to attend sports events and write and/or

## AHSS Year 2 Modules

### BR4921 - BROADENING: BEGINNERS GERMAN

ECTS Credits: 6 (Year 2 Module)

### 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

record journalistic output to a professional standard for print, online and broadcast. Students will produce a range of material including reports, interviews and feature articles. Assessment will be through the practical production of sport reports for print, online and broadcast; sports interviewing and feature assignments and reflections on learning.

#### **JM4044 - MAGAZINE JOURNALISM AND ADVANCED LAYOUT DESIGN**

*ECTS Credits: 6 (Year 2 Module)*

#### **School of English, Irish and Communication**

**Rationale and Purpose of the Module:** *To give students a thorough understanding of the magazine market, from lifestyle magazines to Business to Business publications, including contract and customer publishing. To enable students to think creatively and develop their ideas to help them understand how magazines work and to create a pitch for a new magazine. Secondly this module aims to further develop students' abilities in sub-editing and design for print and internet by reinforcing learning of the fundamentals of sub-editing practices including grammar, punctuation and syntax for magazine journalism, for both print and online, and basic principles of magazine design using text and images for print and online.*

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

They will further develop their desktop publishing techniques, analysing the elements of type; writing headlines and stand firsts; editing and handling pictures and developing their skills in layout and proof reading. Students will design pages in a wide variety of styles for magazines and newspapers, using news and feature copy, and using their own photographs and other illustrations.

#### **LA4038 - FAMILY LAW**

*ECTS Credits: 6 (Year 2 Module)*

#### **Law**

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

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

#### **BR4911 - BROADENING: BEGINNERS FRENCH**

*ECTS Credits: 6 (Year 2 Module)*

#### **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 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 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:

- &bull; manage to pronounce very short, isolated mainly ready-made expressions;
- &bull; show a limited control of a few simple grammatical structures;
- &bull; use a very basic repertoire of words related to personal details;
- &bull; use a limited range of vocabulary to talk about particular concrete situations;
- &bull; use a small range of ready-made expressions and phrases related to everyday topics (introductions, leave-taking, apologies);
- &bull; write simple isolated phrases and sentences on everyday topics.

#### **CU4014 - ANALYSING MEDIA DISCOURSE**

*ECTS Credits: 6 (Year 2 Module)*

#### **School of Modern Languages and Applied Linguistics**

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

**Syllabus:** Text linguistics: This section of the course will introduce students to a range of concepts required to

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

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#### **FR4924 - FRENCH FOR BUSINESS 4A**

*ECTS Credits: 6 (Year 2 Module)*

#### **School of Modern Languages and Applied Linguistics**

**Rationale and Purpose of the Module:** *This module is set at B1+ on the Common European Framework of Reference for Languages (CEFR). To extend within a French business context students reading, speaking, writing and listening skills already practised in the previous terms of university study. This is achieved:*  
*by revising and increasing students' knowledge of French vocabulary and grammar by familiarizing them with new aspects of French society and culture by introducing students to Business French relevant to their future professional needs*

**Syllabus:** This syllabus is set at B1+ on the Common European Framework of Reference for Languages (CEFR).

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

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#### **GE4924 - GERMAN FOR BUSINESS 4A**

*ECTS Credits: 6 (Year 2 Module)*

#### **School of Modern Languages and Applied Linguistics**

**Rationale and Purpose of the Module:** *This module is set at B1+ on the Common European Framework of Reference for Languages (CEFR). To prepare students for job interviews and applications and to reflect on their professional goals and career aspirations. To enable students to write and communicate successfully in a professional business and/or legal context in a form they are likely to encounter during their work experience and future career.*

**Syllabus:** This syllabus is set at B1+ on the Common European Framework of Reference for Languages (CEFR).

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

*Prerequisites: GE4924, GE4143*

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#### **JA4914 - JAPANESE FOR BUSINESS 4**

*ECTS Credits: 6 (Year 2 Module)*

#### **School of Modern Languages and Applied Linguistics**

**Rationale and Purpose of the Module:** *This module is set at B1 on the Common European Framework of Reference for Languages (CEFR). To enable students to understand more advanced authentic and near authentic, modern Japanese texts and to produce a greater range of spoken and written texts; to foster in students an understanding and appreciation of modern Japanese writing; to consolidate*

*their knowledge of issues in contemporary Japanese business and society.*

**Syllabus:** This syllabus is set at B1 on the Common European Framework of Reference for Languages (CEFR).

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

*Prerequisites: JA4913*

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#### **JM4034 - JOURNALISM AND WRITING 2: BREAKING NEWS AND FEATURES**

*ECTS Credits: 6 (Year 2 Module)*

#### **School of English, Irish and Communication**

**Rationale and Purpose of the Module:** *Journalism and Writing 2 follows on from Introduction to Journalism from semester one. The course aims to delve deeper into journalistic theory while in the laboratory classes the course aims to develop students' writing skills in producing a variety of news articles including breaking news, short features, long form journalism and reviews for a variety of publications - print and online.*

**Syllabus:** In the lectures students will discuss theories of journalism including; journalism and ethics, normative theories of journalism, journalism in the digital age, citizen journalism, mass communication theory and political economy.

In the labs students will extend their knowledge of different journalistic forms, including breaking news, short features, long form journalism, profiles, vox pops, and reviews. Regular news writing workshops will continue, including one on a breaking news exercise and a wrap story exercise. They will be helped to begin writing for student publications, and will be encouraged to write their own blogs.

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

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### **LP6025 - LANGUAGE AND CULTURE IN THE CLASSROOM 3**

*ECTS Credits: 3 (Year 2 Module)*

#### **School of Modern Languages and Applied Linguistics**

**Rationale and Purpose of the Module:** *This module draws on students' experiences and practices during school placement and their use of classroom materials e.g. textbooks, prescribed literature. It aims to encourage student teachers to consider how reflection on language learning might be facilitated in the language classroom. This will be done in tandem with strategies for continued professional development.*

**Syllabus:** With the School Placement in mind, students will refine their teaching knowledge and understanding of the relevant language systems as appropriate to their level and professional requirements in two of the following languages: English as a Second Language, French, Gaeilge, German, Japanese, Spanish. Emphasis on the active use of the target language; equal promotion of language accuracy and fluency teaching and learning; selection and pedagogical exploitation of authentic materials, design of learning tasks and implementation of literature-focused activities; exploration of current issues in the target cultures within curricula and cycles in the post-primary school; consolidating the use of online language learning tasks and planning for continued professional development regarding virtual learning environments; and Technology-Based Learning Strategies

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### **SO4014 - SOCIOLOGY OF HEALTH AND ILLNESS FOR NURSING AND MIDWIFERY**

*ECTS Credits: 6 (Year 2 Module)*

#### **Sociology**

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

*introduces students to sociological concepts and models of understanding in relation to health and illness and how these affect nursing and midwifery.*

**Syllabus:** Sociological models/theories of health and illness; social determinants of health (gender, ethnicity and class); illness-related stigma; the meanings and experience of chronic illness. Social context of healthcare provision; healthcare policy (historical and contemporary context); equity and healthcare structures. Professionalisation and socialisation of nursing and midwifery; social power of medicine, gender and power relations in health care, discrimination. Relationships between the nurse and midwife and other health care professionals, professional-patient/client relationships. Social context of health care for clients and families, accessing services. Contemporary politics of health care; social implications of healthcare policy, changing context of healthcare provision.

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### **SP4134 - SPANISH FOR LEGAL STUDIES (BEGINNERS)**

*ECTS Credits: 6 (Year 2 Module)*

#### **School of Modern Languages and Applied Linguistics**

**Rationale and Purpose of the Module:** *Students within the BA in Law and European Studies who take Spanish as their foreign language benefit from a module that gives them an overview of the Spanish legal system and basic legal terminology. Students will compare the Irish legal system to the Spanish legal system and will acquire basic knowledge of Spanish legal terminology.*

**Syllabus:** Extracts from newspapers and magazines, dealing with topical issues specifically related to the field of law in the Hispanic world- will be selected for reading comprehension and other related language work, developing a critical view through discussion. A selection of audio and video material will be used for oral and aural skills facilitating integration of all language skills. Practice of new grammatical aspects of Spanish will also

be included.

A class will be devoted to introducing, practising and improving the use of specific grammatical areas such as the past tenses and the introduction of the subjunctive in Spanish.

*Prerequisites: SP4133*

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### **SP4156 - SPANISH FOR BUSINESS 4 (BEGINNERS)**

*ECTS Credits: 6 (Year 2 Module)*

#### **School of Modern Languages and Applied Linguistics**

**Rationale and Purpose of the Module:** *This module is set at B1 on the Common European Framework of Reference for Languages (CEFR).*

*The module aims to prepare students to communicate with increasing confidence when using Spanish in a Spanish or Latin American working environment and to give them an overview of the organisation of public administration, national firms and related economic issues in Spain and other Spanish-speaking countries, including Latino cultures in the USA.*

**Syllabus:** This module is set at B1 on the Common European Framework of Reference for Languages (CEFR).

The main areas of grammar covered are: the passive voice; imperative forms which use the subjunctive; the conditional tense; second and third conditionals; present subjunctive with temporal adverbs and to express future time.;

The main areas of phonology covered are: reinforcement of the vowel and consonant systems and basic word stress patterns.

The above are complemented by communicative, lexical and oral and written skills syllabi included in a textbook which will be chosen according to the range of availability at the relevant point in time. An example of the latter would be units 1-3 of the textbook Expertos. These include areas such as: writing CV and job applications and participating in interviews; the language of business meetings and negotiations; cross-cultural politeness; expressing opinions, conditions and agreement; the lexis

of expatriate life; conducting interviews. The details of these syllabi are described at:  
<https://www.difusion.com/catalogo/metodos/profesional/expertos/expertos-libro-del-profesor>

**Prerequisites:** SP4153

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### **SP4166 - SPANISH FOR BUSINESS 4**

*ECTS Credits: 6 (Year 2 Module)*

#### **School of Modern Languages and Applied Linguistics**

**Rationale and Purpose of the Module:** *This module is set at B1+/B2 on the Common European Framework of Reference for Languages (CEFR).*

*To extend within a Spanish business context students' reading, speaking, writing and listening skills already practised in the previous semesters. This is achieved principally by revising and increasing students' knowledge of Spanish vocabulary and grammar and discourse and genre characteristics. An increasing emphasis is placed on facilitating students' command of aspects of the language most centrally relevant to their future professional needs.*

**Syllabus:** This module is set at B1+/B2 on the Common European Framework of Reference for Languages (CEFR).

There is no syllabus of linguistic items specific to this module, as the main grammatical structures, etc. of Spanish have been covered in previous modules and are consolidated and developed in this and the other remaining modules of the course. This module provides students with the space to expand their knowledge and language skills. Using authentic material, students are asked to perform in a simulated business environment a variety of tasks encountered in specific situations. A particular focus area is corporate culture (workers and their workplace, internal communication, time management). In addition students make short oral presentations in the target language on selected Spanish social/ cultural issues.

**Prerequisites:** SP4163

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### **SP4914 - SPANISH FOR BUSINESS 4**

*ECTS Credits: 6 (Year 2 Module)*

#### **School of Modern Languages and Applied Linguistics**

**Rationale and Purpose of the Module:** *This module is set at B1 on the Common European Framework of Reference for Languages (CEFR).*

*The module aims to prepare students to communicate effectively and confidently when using Spanish in a Spanish or Latin American working environment and to give them an overview of the organisation of public administration, national firms and some relevant economic issues in Spain and other Spanish speaking countries.*

**Syllabus:** This syllabus is set at B1 on the Common European Framework of Reference for Languages (CEFR).

A series of articles from newspapers, magazines, journals, textbooks and the internet dealing with topical issues specifically related to the business in the Hispanic world will be selected for text analysis and as source material for essay writing. A selection of audio and material recording on DVD will be used for oral and aural skills. Course work included preparation of CVs and letters of presentation when looking for a job. Simulation of job interviews with special attention to the use of formal language and negotiation of working conditions.

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### **SP4934 - SPANISH FOR LAW STUDENTS (ADVANCED)**

*ECTS Credits: 6 (Year 2 Module)*

#### **School of Modern Languages and Applied Linguistics**

**Rationale and Purpose of the Module:** *Students within the BA in Law and European Studies who take Spanish as their foreign language benefit from a module that gives them an overview of the Spanish legal system and basic legal terminology. This module will help students :*

*- To consolidate and further develop productive and receptive language skills at an advanced level.*

- *To facilitate students' understanding of legal terminology used within the Spanish legal world.*
- *To develop basic translation skills of legal documentation from Spanish into English: contracts, wills, powers of attorney, etc.*

*Students will compare the Irish legal system to the Spanish legal system and will acquire certain knowledge of Spanish legal terminology.*

**Syllabus:** - A series of articles from newspapers, magazines, journals, textbooks and the Internet dealing with topical issues specifically related to the field of law in the Hispanic world- will be selected for text analysis and as source material for essay writing.

- A selection of audio and material recorded on DVD will be used for oral and aural skills. A debate class in groups will facilitate integration of all related language skills. A variety of topics relating to issues in legal ethics, i.e. human rights, euthanasia, death penalty and terrorism will be discussed.

- A class will be devoted to practise and improve the students' command of Spanish concentrating on difficult grammatical areas and the pragmatics of the language.

- Basic translation of legal documentation from Spanish into English.

**Prerequisites:** SP4143

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### **CW4004 - LEADING AND SUSTAINING COMMUNITY CHANGE**

*ECTS Credits: 15 (Year 2 Module)*

#### **Politics and Public Admin**

**Rationale and Purpose of the Module:** *The Leadership Module is designed to help students become truly effective leaders. This module recognises that the acquisition of leadership skills is a life-long process. Students will learn about; the characteristics of effective leaders and how leaders function within groups and society. The module will consolidate learning from Practicum I as it relates to Leading and Sustaining Change in the Community and prepare for implementation of project work to be undertaken in practicum 2.*

*The graduate attributes developed by participation in this module are 'proactive' 'creative' 'responsible'*

'collaborative' and 'articulate. The focus on leadership in this module includes attention to competence in; conveying ideas clearly and effectively, recognising the local and global impact of decisions, proficiency in working with others, capacity to see new possibilities and confidence to take initiative.

**Syllabus:** In this module students will learn about psychological and social theories of relevance to leadership, leadership styles, and the contexts where leadership occurs. Students will have opportunities to reflect on and develop their own leadership skills (e.g. conducting effective meetings, group facilitation, negotiation skills, needs analysis, community profiling). Students will learn about the benefits and challenges of community leadership and the qualities of effective community leaders. Principles of teamwork. Factors which may impede or facilitate change. Implementing change, project planning, implementation and evaluation will be addressed. Supervision and delegation.

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#### PO4004 - GLOBAL POLITICAL ECONOMY

ECTS Credits: 6 (Year 2 Module)

#### Politics and Public Admin

**Rationale and Purpose of the Module:** This module aims to familiarise the student with the basic principles and issues in Global Political Economy (GPE). These include the theories associated with GPE and the institutions that manage it. The module, through the assignments and the tutorials, will also develop writing and oral presentation skills.

**Syllabus:** This module is divided into two sections. The first will deal with the theories used to explain the GPE (mercantilism, liberalism and critical theory) and how they interact and contribute towards the changing nature of global politics. The second will look at the institutional and governmental workings of the global economic, and discuss the context and impacts such governance has had. By the end of the course students should be able to grasp the linkages between politics and economics at the global level and be able to critically evaluate key concepts such as globalisation, the relationship between states and markets, the emergence of multinational economic actors and the role and purpose of institutions such as the World Bank, International Monetary Fund and World Trade Organisation

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#### UP4102 - PRACTICUM 2

ECTS Credits: 15 (Year 2 Module)

#### Politics and Public Admin

**Rationale and Purpose of the Module:** The UL Practicum provides a mechanism to broaden the curriculum through action-oriented research and service-learning. It is designed to facilitate students to work in cross disciplinary teams, on real-world problems, identified by external partners. Students on this module will take part in faculty designed, multi or inter-disciplinary applied research projects in collaboration with external community stakeholders (civic, public, private). As with any project, Practicum projects will comprise a varied number of work packages, which may require a variety of levels of experience and/or skills. This experiential and disciplinary diversity will be provided by a team of students with different disciplinary and programme expertise, in terms of their competence levels (eg. undergraduate or postgraduate) and the extent of their involvement in the project (eg. as part of a programme, as an elective or as a dissertation)

This UL Practicum module reflects student input and work that is equivalent to one diploma level module at 15 ECTS

**Syllabus:** This module will provide students with practical experience, generic skills development (such as applied research work, team work, problem-solving and project work) as well as the experience of being part of a multi- or inter- disciplinary team. It will enable them to apply the disciplinary knowledge that they have learnt to multi-faceted real-world problems. Students will: take part in problem identification and ideation; develop a deeper understanding of academic issues areas and problems in consultation with external stakeholders; work towards solutions in collaboration; implement identified changes and evaluate outcomes. A reflective practice will underpin the student experience throughout.

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## AHSS Year 3 Modules

#### HI4046 - CONTESTING THE PAST: WRITING HISTORY

ECTS Credits: 6 (Year 3 Module)

#### 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 and resources and the archive will be scrutinised from a variety of perspectives, including postmodern and postcolonial interdisciplinairties. 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?

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#### HI4056 - NEW HEAVEN, NEW EARTH, POWER AND BELIEF IN THE EUROPEAN REFORMATION, 1517-1618

ECTS Credits: 6 (Year 3 Module)

#### History

**Rationale and Purpose of the Module:** This module examines the history of the Reformation in central Europe. It interrogates how and why the theological interventions of a relatively unknown professor at a minor university (Martin Luther of Wittenberg) ultimately

*gave rise to fundamental changes in the religious, political, and social order of the period. The module explores varieties of Reformation thought from the conservative to the radical and aims to interrogate their social and political implications and general historical significance. The module is designed for third-year students of History. The module will enable these students to develop a thorough understanding of the European Reformation in its various guises. It is also intended to act as a bridge between the general surveys of early modern history offered in years 1 and 2 and the specialist electives offered in year 4.*

**Syllabus:** The late medieval Church; popular piety in the late medieval world; pre-Reformation patterns of heresy and reform; Christian Humanism; Martin Luther, a Wittenberg theologian; preaching, propaganda and cultures of persuasion; political responses to Luther in the Holy Roman Empire; Huldrych Zwingli and the Reformation in Zurich; iconoclastic fury and the populous unleashed; the early Reformation in the cities; the Radical Reformation; the German Peasants' War; Apocalypse Now: Anabaptist Münster and the New Jerusalem; the Magisterial Reformation; Calvin's Geneva and the Second Reformation; International Calvinism; Catholic Reform; the Counter-Reformation and the Council of Trent; political conflict and settlements in the Holy Roman Empire; confessionalization and social discipline; religious exiles and refugees; the Reformation and the family; female religious congregations and the Reformation; the Reformation and education.

#### **HI4076 - PATRIOTS TO PARRELL: IRELAND, 1750-1891**

*ECTS Credits: 6 (Year 3 Module)*

##### **History**

**Rationale and Purpose of the Module:** *The aim of this survey module is to provide an introduction to Ireland during the period 1750-1891 using three interrelated themes: economies, societies and cultures, political and civil societies.*

**Syllabus:** ENVIRONMENTS AND ECONOMIES: wind, rain, soil; diet: cattle, grain, roots; regional ecologies, economies and cultures; growth and crisis; land, wages, prices, trade; demographic transitions: births, deaths, migrations; infrastructures; Famine and disease

**SOCIETIES AND CULTURES:** rural social structures: landownership, farming, labour; the cult of improvement; household; gender, sexuality and patriarchy; urban society: merchants, trades, mendicants; the languages of Ireland: Anglicisation 1750-1891; belief and faith;

**POLITICAL AND CIVIL LIFE:** the constitution: king, lords and commons of Ireland; constituencies and franchises; parties, patriots and politics; 1798 rebellion and Union; the politics of Daniel O'Connell to Charles Stewart Parnell; agrarianism; unionism, nationalism and republicanism

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#### **EH4125 - FEMINIST LITERARY THEORY**

*ECTS Credits: 6 (Year 3 Module)*

#### **School of English, Irish and Communication**

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

**Syllabus:** This course will combine feminist theory and the analysis of literary texts. We will consider five main areas of feminist theory and criticism: the concept of a 'feminine aesthetic'; the contribution of psychoanalytic theory to understandings of gender, identity and writing; the relationship between æraceÆ, ethnicity and gender in literature; questions of 'gender trouble' and sexuality; and postmodern feminist perspectives as they apply to literary texts. Throughout the course, theoretical approaches will be tested in relation to a range of womenÆs writing. Primary texts will be drawn from English language traditions in the first instance, although writings from other language traditions may be included depending on staff expertise.

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#### **GA4105 - IRISH FOLKLORE 1**

*ECTS Credits: 6 (Year 3 Module)*

#### **School of English, Irish 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*

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#### **JA4246 - JAPANESE LANGUAGE, CULTURE AND SOCIETY 4**

*ECTS Credits: 6 (Year 3 Module)*

#### **School of Modern Languages and Applied Linguistics**

**Rationale and Purpose of the Module:** *This module is set at B1+ on the Common European Framework of Reference for Languages (CEFR). To enable students to understand more advanced authentic and near authentic, modern Japanese texts and to produce a greater range of spoken and written texts; to foster in students an understanding and appreciation of modern Japanese writing; to consolidate their knowledge of issues in contemporary Japanese society.*

**Syllabus:** This syllabus is set at B1+ on the Common European Framework of Reference for Languages (CEFR).

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

*Prerequisites: JA4213*

**TW4006 - WRITING FOR NEW MEDIA**

ECTS Credits: 6 (Year 3 Module)

**School of English, Irish and Communication**

**Rationale and Purpose of the Module:** This module is designed to replace TW4116: Workplace Issues in Technical and Professional Communication. 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 develop an awareness of the social context in which technical and professional communicators work, and the responsibilities associated with the provision of content, considered from ethical and legal perspectives; to develop students' writing skills especially in the area of writing for online media; to develop students' online information design skills; to develop students' ability to design and write for online media, especially blogs and web sites.

**Syllabus:** Ethical issues in professional communication; codes of practice; legal issues (consumer protection, patent, copyright, trademarks, trade secrets). Writing for new media; blogging; web design; information design for special needs; trends in technical communication.

Web design: Dreamweaver and other web design tools.

**LA4006 - MEDICAL LAW**

ECTS Credits: 6 (Year 3 Module)

**Law**

**Rationale and Purpose of the Module:** The aim of this module is to provide students with an understanding of the legal and ethical issues associated with the practice of medicine. The interface between law and medicine has become increasingly controversial in recent years. Aside from traditional concerns such as those relating to medical confidentiality and access to medical records, an increasing awareness of the need to recognise and

respect the autonomy of patients has raised new concerns which the legal system must address. This module seeks to introduce students to the challenges posed in the legal regulation of medical practice by introducing them to the law relating to medical confidentiality, access to medical records, consent to treatment and end-of-life decision-making.

**Syllabus:** This module covers: legal and ethical issues surrounding medical confidentiality and access to medical records; human rights and ethical perspectives on autonomy in healthcare decision-making; informed consent to medical treatment; capacity to consent in relation to minors and those with mental incapacity; refusal of treatment and; end-of-life decision-making.

**LA4035 - LABOUR LAW**

ECTS Credits: 6 (Year 3 Module)

**Law**

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

**Syllabus:** Nature of Labour law, legal classification of the provision of labour, the role of statute in Labour Law. Protective legislation and conditions of employment, health and safety at work, sex discrimination, equal pay. Termination of employment, redundancy, minimum notice and unfair dismissal. Trade unions, legal regulation thereof, worker participation, EC developments. Courts and tribunals in Labour Law.

**CU4026 - HOW TO READ A FILM: INTRODUCTION TO FILM STUDIES**

ECTS Credits: 6 (Year 3 Module)

**School of Modern Languages and Applied Linguistics**

**Rationale and Purpose of the Module:** \* To introduce students to the field of film studies.  
\* To give students the theoretical tools to analyse film.  
\* To give a European perspective on the film industry.

**Syllabus:** This module will make the distinction between knowing a lot about films and being able to address the

question what is cinema.

To this end the module will examine the techniques of film, critical approaches and how major theoretical movements have been applied to this field.

Prerequisites: CU4025

**FR4246 - FRENCH LANGUAGE CULTURE AND SOCIETY 4**

ECTS Credits: 6 (Year 3 Module)

**School of Modern Languages and Applied Linguistics**

**Rationale and Purpose of the Module:** This module is set at B2+ on the Common European Framework of Reference for Languages (CEFR). This module aims:

- To improve oral and written language skills through activities such as textual analysis, translation, essay writing, oral presentations, discussion and debate;
- To provide an in-depth study of aspects of post-war France in political, social and economic contexts;
- To enable students to understand the ideological and cultural background to modern France through a reading of selected eighteenth-century texts;
- To practise translation from and into French of texts relating to post-war France, and to become familiar with the theories relevant to the translation of such texts and the strategies available to the translator when translating them.

**Syllabus:** This syllabus is set at B2+ on the Common European Framework of Reference for Languages (CEFR).

Development of active and receptive language skills, both written and oral; key moments in the history of post-war France; revolutionary ideals in eighteenth-century France; introduction to the theory and practice of translation, focusing on the area of post-war France.

Prerequisites: FR4243

**FR4626 - FRENCH LITERATURE AND CULTURE 4**

**19TH CENTURY ART***ECTS Credits: 6 (Year 3 Module)***School of Modern Languages and Applied Linguistics**

**Rationale and Purpose of the Module:** *To provide students with the means to recognise and evaluate the links between art and society in 19th century France. This is achieved by:*

- giving an overview of the political, economic and cultural development of France from the revolution to circa 1880
- studying selected poems from mid century onwards
- analysing French painting ,paritcularly the the realist/impressionist tradition
- reading and studying a selected realist/naturalist novel

**Syllabus:** The module is structured around a lecture and tutorials.

The lecture will cover aspects of the development of France as well as introducing students to the study and appreciation of painting in the period.

The tutorials will concentrate on textual analysis of the poetry and the novels.

**SO4077 - SOCIOLOGY OF YOUTH***ECTS Credits: 6 (Year 3 Module)***Sociology**

**Rationale and Purpose of the Module:** *To understand and to explore key theoretical perspectives on youth and the youth experience within contemporary contexts To critically engage with key examples of empirical research conducted with young people in a variety of social contexts*

*To encourage and to enable critical and analytical thinking about the diverse ways in which young people are constructed and represented via media, policy and academic discourses*

*To examine the relationship between social theory, methodological approaches, research methods and ethical considerations*

**Syllabus:** This module is focused on the study of young people (middle to late adolescence) in Irish society and addresses a number of critical questions which are rooted in traditional sociological concerns about power,

inequality and representation. In addressing these questions, students will be asked to analytically engage with theoretical perspectives on youth as it intersects with material categories of social class, gender, sexuality, race and ethnicity. Young peoples experiences and interactions with the key social structures of education, the community, the family and work; as well as issues around time and space; young peoples life styles and the existence of gender differentiated cultures will be explored through classic and contemporary empirical research. Public media and policy representations of youth will also be addressed in the context of contemporary media discourse which constructs young people as a wide ranging social problem.

**SP4146 - MODERN AND CONTEMPORARY SPAIN***ECTS Credits: 6 (Year 3 Module)***School of Modern Languages and Applied Linguistics**

**Rationale and Purpose of the Module:** *This module is set at B2 on the Common European Framework of Reference for Languages (CEFR). Consolidation of the structures, functions and vocabulary taught in the first and second years and expands grammatical competence to include complex use of the subjunctive.*

*Further development of knowledge of contemporary Spain and Latin American cultures and societies, with a particular focus on the interaction between Spain, Europe and the wider world.*

**Syllabus:** This syllabus is set at B2 on the Common European Framework of Reference for Languages (CEFR).

Tutorials: Working with set textbook, complementary audio-visual material, as well as advanced literary texts.

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

**SP4246 - SPANISH LANGUAGE, CULTURE AND SOCIETY 4***ECTS Credits: 6 (Year 3 Module)***School of Modern Languages and Applied Linguistics**

**Rationale and Purpose of the Module:** *This module is set at B2 on the Common European Framework of Reference for Languages (CEFR).*

*Consolidation of the structures, functions and vocabulary taught in the first and second years and expands grammatical competence to include complex use of the subjunctive.*

*Further development of knowledge of contemporary Spain and Latin American cultures and societies, with a particular focus on the interaction between Spain, Europe and the wider world.*

**Syllabus:** This syllabus is set at B2 on the Common European Framework of Reference for Languages (CEFR).

Tutorials: Working with set textbook, complementary audio-visual material, as well as advanced literary texts.

**Prerequisites:** SP4243, SP4233

**TE4106 - TEACHING ENGLISH TO SPEAKERS OF OTHER LANGUAGES (TESOL) 1***ECTS Credits: 6 (Year 3 Module)***School of Modern Languages and Applied Linguistics**

**Rationale and Purpose of the Module:** *To provide students with an introduction to the Teaching of English to Speakers of Other Languages (TESOL). This is the first of a three-module suite, and starts with an overview of the main approaches and methods in language teaching and learning, the different theories of language and language learning and the concept of learning styles. To enable students to comprehend theoretical aspects of the grammatical and phonological aspects of the English language relevant for teaching purposes.*

*To enable students to develop an understanding of the different levels of language competency of English language learners.*

*This is the first of a three-module suite, students also complete TEXXXX (TESOL 2) and TEXXXX (TESOL 3). This suite of modules is intended to give students a foundation in Teaching English to Speakers of Other*

Languages which is validated by TESOL certification from the University of Limerick. TEXXXX (TESOL 1) and TEXXXX (TESOL 3) are offered in the Spring semester; TEXXXX (TESOL 2) is offered in the Autumn semester.

**Note:** This suite of modules replaces 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 integrates three independent but related components:

1. Methods and approaches: Grammar Translation Method, the Direct method, Situational Language Teaching, Audiolingualism, Total Physical Response, the Silent Way, Suggestopedia, Community Language Learning, The Natural Method, Communicative Language Teaching, Task Based Learning, the Lexical Approach, Eclecticism. The Theory of Multiple Intelligences.
2. Grammatical concepts: Word classes: Lexical words (nouns, verbs, adjectives, adverbs); Function words (determiners, pronouns, prepositions, coordinators); Phrase, clause and sentence structure: The Verb Phrase (time, tense, aspect, mood); The English Tense System.
3. English Phonetics and Phonology: individual vowel and consonant sounds ,basic transcription. Suprasegmental aspects of speech: intonation, stress, rhythm. Pronunciation differences between Received Pronunciation and Irish English.

#### **PA4018 - THE PUBLIC POLICY PROCESS**

ECTS Credits: 6 (Year 3 Module)

##### **Politics and Public Admin**

##### **Rationale and Purpose of the Module:** Aims :

This course aims to provide students with an overview of the theory and practice of policy analysis. The process of public policy making in the modern democratic state will be explored with particular reference to the socio-political environment of policy making and organisationally based decision processes within public administration.

##### **Objectives :**

- To build an understanding of what policy is, nature of

policy problems and the role of problem definition in structuring policy

- To focus on theories of the public policy process and explore the variety and complexity of decision making processes
- To identify a classification of approaches to the analysis of public policy
- To investigate and understand how information about public policies is made available and is accountability for outcomes clear
- To evaluate the policy process in government and public bureaucracies through the analysis of case study material
- To promote career development skills

**Syllabus:** What is public policy?; stages approach to the policy process; power approaches - elitism, pluralism, corporatism; agenda setting; models of decision making û Simon, Lindblom, Allison, Etzioni, Dror; institutional approaches; rational choice theory; policy networks; policy transfer; policy implementation; evaluation, accountability; Europeanisation

**Prerequisites:** PA4021

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#### **PO4015 - GOVERNMENT AND POLITICS OF THE EU**

ECTS Credits: 6 (Year 3 Module)

##### **Politics and Public Admin**

**Rationale and Purpose of the Module:** The module aims to develop studentsÆ understanding of the way the European Union works and how its policy output and powers affect their lives as citizens. As a result, the module has two objectives. First, to give students a solid understanding of the history, institutions, decision-making processes and major policies of the European Union. Second, to equip students with an appreciation of the principal issues and controversies which currently face the European Union.

**Syllabus:** The course is divided into two main parts: The first part looks at the EU Institutions and introduces the basic theories of European integration. The second part concentrates on policies and current EU issues.

**Prerequisites:** PO4011

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#### **SO4006 - THE SOCIOLOGY OF CRIME DEVIANC E AND SOCIAL CONTROL**

ECTS Credits: 6 (Year 3 Module)

##### **Sociology**

**Rationale and Purpose of the Module:** The purpose of this module is to explore the manner in which society seeks to control particular ways of behaving, being and thinking. The broad framework of both informal and formal sanctions will be adopted, but the module will focus in particular on the latter. A critical approach to the ideas which underpin the criminal justice system, its remit and functioning, will be encouraged. Questioning will be facilitated through introducing students to sociological theories of crime and deviance, through their application to contemporary case studies and through comparison to other cultural and historical contexts. Particular attention will be given to inequitable experiences of criminal justice including on the basis of social class, gender, ethnicity and racialized identities, sexuality and legal status.

**Syllabus:** The social construction of deviance and crime; Theories of deviance; Informal social control; Formal social control; The law and social change; Social hierarchies of victims and offenders; Hate crime; Social stratification and the Criminal Justice System - Policing, Sentencing, Incarceration, White collar crime; Sociological perspectives on restorative justice; Victimisation as social control.

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#### **SO4036 - CONTEMPORARY SOCIOLOGICAL THEORY**

ECTS Credits: 6 (Year 3 Module)

##### **Sociology**

**Rationale and Purpose of the Module:** a) Introduce students to a selection of modern and contemporary theories following on the classical tradition.  
b) Develop students understanding of the discipline of sociology in the contemporary context, taking account of changing intellectual and social contexts.  
c) Demonstrate how these theories have been influenced by classical social theories in terms of how they  
- challenge key classical presuppositions about the nature and scope of sociology in understanding the social world;

- their level of indebtedness to or departure from classical theoretical antecedents.

d) Enable students to differentiate between different theoretical approaches in relation to key sociological concepts such as structure and agency, rationality and reflexivity, objectivism and subjectivism, micro-analysis and macro-analysis, realism and constructivism, modernity and postmodernity.

**Syllabus:** This module aims to broaden and deepen students engagement with and understanding of the development of sociology as a discipline following on from their introduction to the sociological classics. It introduces students to a selection of modern and contemporary theories as a way of understanding how sociological theory has developed to reflect changing social and intellectual contexts. The course will identify the extent to which the selected theories build on key classical presuppositions or offer more radical departures in terms of the key analytical debates within sociology. As a way of elucidating these issues, substantive topics will be discussed in relation to the different theoretical perspectives. The range of theoretical perspectives will encompass the following: social constructionism (Berger and Luckmann); the sociology of the everyday (e.g. Goffman, Blumer); critical theory (e.g. Foucault, Habermas, Feminist Theory and theories of late/post-modernity; theories of rationality (Rational Choice/Rational Action theory); and the theory of social practice (Bourdieu).

#### **SO4046 - QUANTITATIVE METHODS FOR SOCIOLOGICAL RESEARCH**

ECTS Credits: 6 (Year 3 Module)

#### **Sociology**

**Rationale and Purpose of the Module:** This module considers quantitative research in relation to sociology. This module aims to develop students knowledge gained in SO4053 to increase and deepen their understanding of and facility with quantitative research methods; particularly to develop their facility in the analysis of quantitative data. The primary objective of the course is to ensure that students are able to understand and use basic quantitative methods. The course begins by reviewing the role of quantitative methods in sociology, with consideration of the theoretical implications of the

method and of the sorts of research it permits. It then moves on to a practical core, introducing basic techniques for data collection, processing, presentation and statistical analysis. The lectures run in parallel with lab sessions, in which students use SPSS and other relevant software.

**Syllabus:** This course introduces students to the basic statistical analysis of social data, including simple descriptive statistics and presentations, samples, surveys and elementary probability theory, inferential statistics, bivariate measures of association and multivariate techniques including an introduction to linear regression and correlation. The class will provide the practical skills to analyse and draw conclusions from quantitative social science data. Emphasis will be placed on understanding, computing and interpreting basic statistics; interpreting and evaluating survey research findings; and analysing quantitative data with statistical software programmes such as SPSS.

#### **FR4146 - FRENCH LANGUAGE AND SOCIETY 4 MODERN CONTEMPORARY**

ECTS Credits: 6 (Year 3 Module)

#### **School of Modern Languages and Applied Linguistics**

**Rationale and Purpose of the Module:** This module is set at B2+ on the Common European Framework of Reference for Languages (CEFR). This module is an introduction to contemporary social, economic and political life in France. This is achieved: by developing students' knowledge of French culture and society by focusing on the country's cultural, social and political aspects by encouraging team-work and intercultural understanding.

**Syllabus:** This syllabus is set at B2+ on the Common European Framework of Reference for Languages (CEFR).

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 in French politics, economics and society from 1945 to the present. Language tutorials review some of the points raised in the lectures through close reading and discussion of authentic texts related to the lectures. Language tutorials also endeavour to develop written skills in the French language through translation and/or essay writing. Tutorial are also devoted to the study of a literary text closely related to the subject matter.

**Prerequisites:** FR4143

#### **LA4036 - INTELLECTUAL PROPERTY LAW**

ECTS Credits: 6 (Year 3 Module)

#### **Law**

**Rationale and Purpose of the Module:** Intellectual property (IP) is of great importance in modern society and the provision of legal protection to owners of intellectual property is considered by many to be critical to fostering ideas, rewarding innovation and stimulating economic growth. The significance of IP may be identified across a variety of sectors including the engineering, pharmaceutical, medical, entertainment, fashion and computer/software industries. The aim of the module is to give students an understanding of the various sources and forms of intellectual property (I.P.) rights including patent, trademark, copyright and design protection.

**Syllabus:** This module will explore the various sources and forms of intellectual property (I.P.) rights including:  
1) patents  
2) trademarks  
3) copyrights  
4) designs

The source of these rights, their limitations, infringement and remedies available for breaches will also be covered.

The course will also examine common law protections

available to protect intellectual property including the tort of passing off and breach of confidence.

The focus will be on Irish IP law but will also examine relevant EU directives and global IP treaties.

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**GE4146 - GERMAN LANGUAGE AND SOCIETY 4:  
GERMANY PAST AND PRESENT**  
ECTS Credits: 6 (Year 3 Module)

**School of Modern Languages and Applied  
Linguistics**

**Rationale and Purpose of the Module:** *This module is set at B2 on the Common European Framework of Reference for Languages (CEFR). To enhance students' knowledge about present day Germany by exploring the historical background of cultural life in Germany today. To further develop writing skills and reading comprehension at advanced level. To further develop students' skills in the analysis of more complex literary texts in German. To consolidate grammatical structures at an appropriate level.*

**Syllabus:** This syllabus is set at B2 on the Common European Framework of Reference for Languages (CEFR).

Lecture: German revolutions, democracy, fascism; cultural institutions, cultural life; the cultural and literary heritage.

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

**Prerequisites:** GE4143

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**GE4246 - GERMAN LANGUAGE CULTURE AND  
SOCIETY 4**  
ECTS Credits: 6 (Year 3 Module)

**School of Modern Languages and Applied  
Linguistics**

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

*set at B2 on the Common European Framework of Reference for Languages(CEFR). To develop students' understanding of contemporary Germany by analysing central issues/concepts from 18th century to the present day; to consolidate and improve text analysis and oral, reading and writing skills, to revise problem areas in German grammar and introduce selected new or more complex grammatical and syntactic structures. To introduce the systematic study of translation theory and practice, to introduce students to a range of text-types and registers.*

**Syllabus:** This syllabus is set at B2 on the Common European Framework of Reference for Languages (CEFR).

Lecture: German revolutions, democracy, fascism; cultural institutions, cultural life; the cultural and literary heritage.

Tutorial work: Oral presentation & discussion class: drawing on text and audio-visual materials to develop formal oral skills (note-taking, structuring presentations, summarising and reporting content); Literary text analysis & production; Translation theory and practice:historical and socio-political texts

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**GE4626 - GERMAN LITERATURE AND CULTURE 4**  
ECTS Credits: 6 (Year 3 Module)

**School of Modern Languages and Applied  
Linguistics**

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

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

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**PO4016 - ISSUES OF EUROPEAN INTEGRATION**  
ECTS Credits: 6 (Year 3 Module)

**Politics and Public Admin**

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## AHSS Year 4 Modules

**CU4018 - EUROPEAN CINEMA FROM THE 1960s TO  
THE PRESENT**

ECTS Credits: 6 (Year 4 Module)

**School of Modern Languages and Applied  
Linguistics**

**Rationale and Purpose of the Module:** *To give students a comprehensive overview of the major currents and trends in European cinema in the post Second World War period with the advent of the French Nouvelle Vague being considered as a watershed event. To build on students prior knowledge and exposure to film studies and enhance their ability to analyse and critique films.*

**Syllabus:** This module will build on students prior experience of film studies and will involve a comprehensive overview of the major cinematic movements in contemporary Europe over the last fifty years with an introduction to some of the major directors of this period and their oeuvre. The module will also examine the techniques of film as employed by these directors, their critical approaches and how major theoretical movements have been influential in their work. It will lastly consider the impact of the digital revolution on film making and the film industry.

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**FR4148 - FRENCH LANGUAGE AND SOCIETY 6  
MEDIA/CURRENT ISSUES**

ECTS Credits: 6 (Year 4 Module)

**School of Modern Languages and Applied  
Linguistics**

**Rationale and Purpose of the Module:** *This module is set at C1 on the Common European Framework of*

**Reference for Languages (CEFR).**

The purpose of this module is to give students an overview of the French media industries and the ability to evaluate their functions. This is achieved by:

- the study of the relationship between the media and the state
- in depth analysis of different branches of the media
- practice in using the language of the media and in analysis particular media artefacts.

**Syllabus:** This syllabus is set at C1 on the Common European Framework of Reference for Languages (CEFR).

This module has three parts, each dedicated to particular aim of the module.

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

**Prerequisites:** FR4147

#### **FR4248 - FRENCH LANGUAGE CULTURE AND SOCIETY 6**

ECTS Credits: 6 (Year 4 Module)

**School of Modern Languages and Applied Linguistics**

**Rationale and Purpose of the Module:** This module is set at C1 on the Common European Framework of Reference for Languages (CEFR).

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

**Syllabus:** This syllabus is set at C1 on the Common

European Framework of Reference for Languages (CEFR).

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

**Prerequisites:** FR4247

#### **FR4628 - FRENCH LITERATURE AND CULTURE 6: MODERNITY AND GENRE; THE NOVEL IN FRENCH**

ECTS Credits: 6 (Year 4 Module)

**School of Modern Languages and Applied Linguistics**

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

**Syllabus:** The module seeks to foster a sense of the long-term in cultural and literary developments. Hence the inclusion of texts spanning four centuries (17th, 18th, 19th and 20th). Elements of context will be provided, through the inclusion of reference to wider historical development, social and cultural theory, and to the parallel and related development of other literary genres. Secondary reading will be duly circumscribed with emphasis being placed on thorough and close

readings of the individual works. This emphasis will be replicated in the forms of assessment adopted. Students will be required to give an analytical presentation in the target language of an agreed extract (close reading and linguistic skills). Assessment will also include an extended synthetic essay in the target language (argumentational and linguistic skills).

#### **FR4928 - FRENCH FOR BUSINESS 8A**

ECTS Credits: 6 (Year 4 Module)

**School of Modern Languages and Applied Linguistics**

**Rationale and Purpose of the Module:** This module is set at C1 on the Common European Framework of Reference for Languages (CEFR).

While building on previously acquired reading, speaking, writing and listening skills, the course aims to enhance students' / ability to engage with and express effectively ideas and concepts through the means of the target language relating to contemporary French -society and issues.

- by working with authentic documents (press articles, one literary text, websites)
- by providing students with opportunities to practice their oral and written skills
- by encouraging intercultural understanding via tandem learning with French students

**Syllabus:** This syllabus is set at C1 on the Common European Framework of Reference for Languages (CEFR).

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

Prerequisites: FR4927

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### **GE4148 - GERMAN LANGUAGE AND SOCIETY 6: ISSUES AND DEBATES**

ECTS Credits: 6 (Year 4 Module)

#### **School of Modern Languages and Applied Linguistics**

**Rationale and Purpose of the Module:** This module is set at C1 on the Common European Framework of Reference for Languages (CEFR).

To explore current issues of particular relevance in the German speaking countries today with a particular focus on literary/cultural controversies

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

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

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

**Syllabus:** This syllabus is set at C1 on the Common European Framework of Reference for Languages (CEFR).

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

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

Prerequisites: GE4147

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### **GE4248 - GERMAN LANGUAGE CULTURE AND SOCIETY 6**

ECTS Credits: 6 (Year 4 Module)

#### **School of Modern Languages and Applied Linguistics**

**Rationale and Purpose of the Module:** This module is set at C1 on the Common European Framework of Reference for Languages (CEFR).

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

**Syllabus:** This syllabus is set at C1 on the Common European Framework of Reference for Languages (CEFR).

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

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

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### **GE4628 - CURRENT TRENDS IN GERMAN LITERATURE AND CULTURE**

ECTS Credits: 6 (Year 4 Module)

#### **School of Modern Languages and Applied Linguistics**

**Rationale and Purpose of the Module:** To develop an

understanding of current trends and developments in literature, cinema and other forms of cultural practice in post-unification Germany, in Switzerland and in Austria by studying individual works in their social and political context.

To engage critically with contemporary literary and cultural production in the German-speaking countries and to analyse a variety of literary texts and films in German.

**Syllabus:** An examination of most recent developments in literature and cinema in the German-speaking countries. Analysis of literary texts, films and other cultural products (TV, music, visual arts etc) in their social and political context and discuss how they engage with issues that feature strongly in current debate, such as multiculturalism, experiences of migrants, new womenÆs writing, postcolonial aspects, questions of identity and changing memory discourses. Recent debates on colonialism and post-colonialism in a German context; Postmodernism and Pop Literature; Changing Constructions of Identity in Germany, Switzerland and Austria.

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### **GE4928 - GERMAN FOR BUSINESS 8A**

ECTS Credits: 6 (Year 4 Module)

#### **School of Modern Languages and Applied Linguistics**

**Rationale and Purpose of the Module:** This module is set at C1 on the Common European Framework of Reference for Languages (CEFR).

To develop the skill of precise writing in German. To provide an insight into the workings of the European Union (EU) and to examine the role of Ireland and Germany and current challenges and chances. To cover current topics and debates in the German-speaking countries. To prepare students to sit, on an optional basis, international examinations in Business German such as "Pr<sup>3</sup>fung Wirtschaftsdeutsch international".

**Syllabus:** This syllabus is set at C1 on the Common European Framework of Reference for Languages (CEFR).

Lecture: cultural, economic and political issues in unified

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

**Tutorials:** a) discussions of literary texts, newspaper, magazine articles and TV programmes on topical issues connected with the lecture, focusing on the characteristics of different text types and language registers; b) examination of the institutions and policies of the EU with particular reference to Germany's and Ireland's role within the EU; c) revision of business material in general.

**Prerequisites:** GE4927

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#### **HI4117 - THE IRISH CONFLICT, 1948 - 98**

**ECTS Credits:** 6 (Year 4 Module)

#### **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.

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#### **HI4158 - CULTURE AND ANARCHY: IRELAND IN THE TWENTIETH CENTURY**

**ECTS Credits:** 6 (Year 4 Module)

#### **History**

**Rationale and Purpose of the Module:** *This module charts the history of Ireland from the Gaelic Revival years, through to the establishment of a Free State within the British Empire, to the emergence of a republic, and up to the signing of the Northern Ireland peace agreements of the 1990s.*

**Syllabus:** The module is divided into lecture themes which address a wide range of topics, including: the Gaelic revival and other cultural movements, home rule and unionism, the impact of the Boer War on Ireland, rise of Sinn Fein, Larkin and the Union Movement, Connolly and Irish Socialism, 1916 Rising, War of Independence, Civil War and Partition, the Northern Ireland state; Ireland during and after the Second World War, the declaration of the Republic, the place of women and children in Irish society, Civil Rights and the origins of the modern 'Troubles'; and to road to the Belfast peace agreements.

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#### **JA4248 - JAPANESE LANGUAGE, CULTURE AND SOCIETY 6**

**ECTS Credits:** 6 (Year 4 Module)

#### **School of Modern Languages and Applied Linguistics**

**Rationale and Purpose of the Module:** *This module is set at B2+ on the Common European Framework of Reference for Languages (CEFR). To consolidate students' previous acquisition of Japanese*

*and to bring them to an upper intermediate level of language use in listening comprehension, speaking, reading and writing; to continue the study of Japanese culture and society.*

**Syllabus:** This module is set at B2+ on the Common European Framework of Reference for Languages (CEFR). Listening practice using authentic materials. Further practice in the use of polite language. Vocabulary consolidation; presentations, practice for interviews. Reading practice of authentic news stories, and authentic passages relating to Japanese society and modern literature. Translation of authentic passages, literary or business-related. Writing of summaries, descriptions, letters, and passages expressing opinions. Study of a further 200 kanji, to bring the total up to 750 characters.

**Prerequisites:** JA4247

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#### **JA4918 - JAPANESE FOR BUSINESS 8**

**ECTS Credits:** 6 (Year 4 Module)

#### **School of Modern Languages and Applied Linguistics**

**Rationale and Purpose of the Module:** *This module is set at B2+ on the Common European Framework of Reference for Languages (CEFR). To consolidate students' previous acquisition of Japanese and to bring them to an upper intermediate level of language use in listening comprehension, speaking, reading and writing; to continue the study of Japanese culture and society.*

**Syllabus:** This syllabus is set at B2+ on the Common European Framework of Reference for Languages (CEFR). Listening practice using authentic materials. Further practice in the use of polite language. Vocabulary consolidation; presentations, practice for interviews. Reading practice of authentic news stories, and authentic passages relating to Japanese society and modern literature. Translation of authentic passages, literary or business-related. Writing of summaries, descriptions, letters, and passages expressing opinions. Study of a further 200 kanji, to bring the total up to 750 characters.

*Prerequisites:* JA4917

#### **JA4628 - JAPANESE LANGUAGE AND LITERATURE 2: MINORITY LITERATURE**

*ECTS Credits:* 6 (Year 4 Module)

#### **School of Modern Languages and Applied Linguistics**

**Rationale and Purpose of the Module:** *To develop students' knowledge of the cultural and literary influence of Japanese ethnic minorities through studying the work of authors from these minorities writing in Japanese today; to develop students' skills in communicating in oral and written Japanese.*

**Syllabus:** Students are introduced to issues of ethnicity in contemporary Japan through the study of representative literary texts by authors from the minorities concerned, notably the Japanese-Korean and the Okinawan minorities.

#### **LA4008 - COMPANY AND PARTNERSHIP LAW**

*ECTS Credits:* 6 (Year 4 Module)

#### **Law**

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

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

**Syllabus:** Corporate formation: types of companies, formalities, advantages and disadvantages of incorporation, corporate personality, piercing the veil, groups of companies; corporate governance; role of shareholders, directors, employees, directors' duties, AGM, accounts and audits; minority shareholder protection; protection of parties dealing with corporations: creditors, voluntary and involuntary, charges over companies; ultra vires contracts; capital integrity; minimum requirements, distributions out of

profits, repayments of capital; corporate termination: liquidation, receivership, winding up, examinership, amalgamations and reconstructions. Partnerships; joint and several liability; formation of partnerships; dissolution of partnerships; limited partnerships.

#### **LA4058 - HUMAN RIGHTS LAW**

*ECTS Credits:* 6 (Year 4 Module)

#### **Law**

**Rationale and Purpose of the Module:** *The aim of this module is to introduce students to the study of international human rights law.*

**Syllabus:** Upon successful completion of this model students will have a detailed knowledge of the international human rights law framework and will be familiar with the major universal and regional systems of human rights law and the legal value and authority of declarations, decisions, judgments and other output engendered by them. The syllabus will focus extensively on the Council of Europe structures for human rights protection and the United Nations treaty system with emphasis on the impact that the international system has on Irish law. Students will be expected to critically explore the development and expansion of this emerging field of law.

#### **LA4078 - FAMILY LAW**

*ECTS Credits:* 6 (Year 4 Module)

#### **Law**

**Rationale and Purpose of the Module:** *[An additional module code is needed for Family Law when it runs as part of the Evening LLB so as to distinguish it from the day law programmes which uses LA4038.]*

*The aim of the course is to familiarise students with the*

*core concepts of Irish family law.*

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

#### **LA4828 - EQUITY AND TRUSTS 2**

*ECTS Credits:* 6 (Year 4 Module)

#### **Law**

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

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

#### **LA4938 - ADMINISTRATIVE LAW**

*ECTS Credits:* 6 (Year 4 Module)

#### **Law**

**PA4007 - CAREERS AND INFLUENCE IN PUBLIC LEADERSHIP: MINISTERS AND CIVIL SERVANTS**

*ECTS Credits:* 6 (Year 4 Module)

#### **Politics and Public Admin**

**Rationale and Purpose of the Module:** *This module introduces students to the roles of institutions and individual attributes in shaping ministers' and civil servants' careers and policy influence. The interactions of ministers and civil servants are central to the functioning of democratic political systems, yet these actors have*

different incentives and career patterns. The module provides students with a grounding in Principal-Agent theory as it is applied to ministerial and civil service careers and to delegation and accountability in democratic systems. It takes a comparative, cross-national perspective, allowing students to become familiar with the institutions and norms that shape these careers in European democracies. In doing so, it broaches issues such as representation, gender balance, generalist and specialist recruitment, technocratic government, and accountability.

**Syllabus:** Selection: a. ministers; b. civil servants.

De-selection: a. ministers; b. civil servants.

Ministers and civil servants: interdependence, cooperation, and conflict.

Policy influence: a. ministers; b. civil servants.

Further career prospects: a. ministers; b. civil servants.

Institutional reforms and the core executive.

The course is structured around a series of career outcomes: selection, de-selection, and policy influence, as well as career prospects after a spell in office. It examines factors that influence these outcomes, including gender, age, the nature of the individual's past experience (including the special case of civil servants who become ministers), and performance. Informed by the course's cross-national perspective, we consider institutional variations and reforms, in areas such as remuneration, pay-for-performance, gender quotas, term limits, and generalist (or specialist) recruitment. We also look at the minister-civil servant relationship in a more general sense: how do these actors work together effectively? Who is accountable? What are their incentives?

#### PO4018 - INTERNATIONAL RELATIONS

ECTS Credits: 6 (Year 4 Module)

**Politics and Public Admin**

**Rationale and Purpose of the Module:** Provides an overview of some of the theoretical debates and issues that have underpinned the study of International Relations (IR). Theoretical perspectives such as Realism, Liberalism and Structuralism will be introduced and this will allow students to apply these to the arena of world politics and to processes such as the interactions of states, the workings of International Organisation and

the global economy

**Syllabus:** The module provides an introduction to the theoretical perspectives within International Relations (IR) - Realism; Liberalism; Structuralism; Critical Theory; Post-Modernism; Constructivism; Feminism. It then introduces the major aspects of study within IR - Power; Security; War and Peace; Foreign Policy and Diplomacy; International Political Economy; International Organisations

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#### PO4108 - MULTICULTURALISM AND POLITICAL THEORY

ECTS Credits: 6 (Year 4 Module)

**Politics and Public Admin**

**Rationale and Purpose of the Module:** This module takes up some contemporary themes in political theory, examining the concepts of justice, freedom, equality, democracy, pluralism and respect in light of the demands for greater recognition and accommodation that have been put forward by ethnic, racial, religious, and linguistic minorities. The aim of this module is to explore the formidable problems raised by the challenge of cultural diversity from the perspective of normative political theory, and in particular to evaluate the a range of alternative justifications for multicultural political policies.

*By the end of the module, students should be aware of the various rights claims, policy proposals and political alternatives that have been suggested by and on behalf of minority cultural communities; have a sense of the challenges these pose to established liberal theories and to liberal-democratic practices; be able to critically evaluate the various justifications offered; understand a range of arguments for and agai*

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

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#### PA4048 - DECENTRALISATION AND DEVELOPMENT

ECTS Credits: 6 (Year 4 Module)

**Politics and Public Admin**

**Rationale and Purpose of the Module:** Using a thematic approach, this course aims to enable students to understand the role of subnational governments as enablers of development and to explore various systems of sub-national government and different approaches to decentralisation. Themes include institutional structures and the relationships between different levels of government; the operation of sub-national governance; fiscal and functional decentralisation; participation in decentralised governance; policy issues; the origin, nature and implications of the challenges facing decentralised governments.

This module is created as core for semester 8 of the BA International Public Administration and Development and can be offered as an elective and on Public Administration options in several AHSS programmes. This module would replace the current module PA4017 Subnational Government in Europe.

**Syllabus:** Sub-National Governance: Principles and Theories; Systems & Structures, Regional & Local; Approaches to Decentralisation; Local Development; Reform trends; Participation; Policy issues; Challenges confronting decentralised governments.

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#### PA4058 - CIVIL SOCIETY, CIVIC ENGAGEMENT AND PUBLIC ADMINISTRATION

ECTS Credits: 6 (Year 4 Module)

**Politics and Public Admin**

**Rationale and Purpose of the Module:** This module introduces students to the role of civil society, theoretically and in practice. It also explores the closely related notion of civic engagement, presenting arguments for and against deeper citizen participation, exploring ways in which it might be achieved and understanding the possible implications for public administration.

This module will be offered on the new BA Arts programme.

**Syllabus:** This module will introduce students to theories and practice about the role of civil society and civic engagement in the broader context of democratic development. The module has four main elements which will:

1. Establish the theoretical and applied justifications for democratic participation and civic engagement through: exploring the conceptual arguments for deeper democratic participation; exploring different conceptions of civil society and analysing the rhetoric and reality of civic engagement;
2. Investigate the role of public administration in enabling democratic participation and civic engagement through: examining the nature of bureaucratic responsiveness and rationalities and their possible impacts on civil society and civic engagement; exploring issues of state capacity and the related ideas about the relational state
3. Describe practical approaches to promoting the role of civil society and civic engagement, focusing on different levels and depth of participation and engagement; approaches that enhance democratic participation and civic engagement; approaches that inhibit democratic participation and civic engagement
4. Collectively and collaboratively develop a series of case studies of democratic participation and civic engagement on themes such as: Participatory Budgeting; participation in urban regeneration; facilitating participation in rural areas; E-Participation; civil society action.

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#### PO4068 - POLITICAL LEADERSHIP

ECTS Credits: 6 (Year 4 Module)

**Politics and Public Admin**

**Rationale and Purpose of the Module:** *This module introduces students to the debates over leadership choices, in particular to the issue of the influence of institutional design on political and economic outcomes such as the sustainability and performance of democratic systems.*

**Syllabus:** The module introduces students to typologies of political leadership and arguments about their

outcome and engages students in case studies of different leadership types and their effects.

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#### SO4008 - SOCIOLOGY OF MEDIA AUDIENCES

ECTS Credits: 6 (Year 4 Module)

##### Sociology

**Rationale and Purpose of the Module:** *The purpose of this module is to introduce students to the emerging area of media audiences. It is built around a number of key issues and concerns that exist around studying media audiences and will address the significant theories and debates on media audiences. Emphasis will also be placed on the development of practical audience research skills which students will be asked to demonstrate and apply to the tasks outlined in their course assignments.*

**Syllabus:** Working from a sociological perspective, this module will document the changing theoretical and methodological paradigms that the study of media audiences has gone through and the impact that these frameworks have had on the nature of research produced and knowledge acquired about the composition and abilities of media audiences in an increasingly media saturated society. The impact of such processes as globalisation, politics and the public sphere, the rise of popular entertainment, the internet and the recent explosion of new media products (e.g. online/offline gaming, Facebook, MySpace, Twitter, and YouTube), and the study of media fans will be discussed. Overall it is hoped that students will become more reflexive about their media usage and develop a new level of understanding about the role that media consumption has on their daily lives.

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#### SO4078 - INEQUALITY AND SOCIAL EXCLUSION

ECTS Credits: 6 (Year 4 Module)

##### Sociology

**Rationale and Purpose of the Module:** *The aim of the module was to introduce the students to the dynamics and processes implicit to inequality and social exclusion.*

*Further, to make them aware of the complexity of the conceptualisation and operationalisation of equality and social exclusion. At the end of the module students will be able to apply their understanding of both concepts to key substantive areas in Irish society.*

**Syllabus:** The key focus and aim of the module is to provide students with a conceptual and operational understanding of the dynamics of inequality and social exclusion. Students will be familiarised with debates, definitions and theoretical frameworks pertaining to both inequality and social exclusion. Specifically the module will focus on the Irish context as it seeks to examine the structural, cultural and ideological dynamics underpinning inequality and social exclusion and their implications for individuals and groups. It will introduce students to the central approaches to measuring inequality and social exclusion. Key will be a focus on the relationship between poverty, inequality and social exclusion. A central theme across the substantive areas covered will be the exploration of the continued significance of class, gender, sexuality, ethnicity, disability, and racial divisions as bases for both social exclusion and inequality. Additionally the module will examine the impact of media texts with particular reference to media discourses about those who are excluded. Finally, the module will refer to institutions and agencies engaging with the above themes.

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#### SO4088 - SOCIOLOGY OF GLOBALISATION

ECTS Credits: 6 (Year 4 Module)

##### Sociology

**Rationale and Purpose of the Module:** *a. To provide an opportunity for the student to examine of key theoretical perspectives and central debates relevant to the study of globalisation  
b. To offer ways of evaluating the work of major sociological schools/theorists in the study of economic, cultural and political globalisation.  
c. To develop the ability to analyse and evaluate various outcomes of globalisation through a critical framework.*

**Syllabus:** The aim of this course is to provide a

comprehensive introduction to the various discourses of globalisation. It will explore some of the key meanings, history and differing theoretical perspectives and interpretations of globalisation in contemporary research, and will identify main policy issues related to economic, cultural and political globalisation. The focus will be the development of transnational communities and cultures including emergent new forms of worldwide political protest; the challenge for trade unions; culture and the 'global and 'local divide; the possibilities for a future global society or culture; the inter-meshing of local-global interests and identities; the inequalities and social exclusion generated by economic globalisation; and the extent to which sociology like other disciplines needs to re-think many of its central concepts, debates and theoretical approaches in the light of globalisation processes. The analysis and discussion will be illustrated with international and Irish case studies.

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#### **SO4108 - SOCIOLOGICAL APPROACHES TO GENDER AND MULTICULTURALISM**

ECTS Credits: 6 (Year 4 Module)

##### **Sociology**

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

**Syllabus:** The syllabus will include theories that account for multiculturalism as a top-down response to cultural difference which produces a reification of 'culture and gender'. It will also examine theories that identify multiculturalism as a new way forward to a 'politics of recognition and progressive gender politics. Examples of gendered cultural practices that raise critical questions for the effectiveness of multiculturalism, such as polygamy, forced marriage, female genital mutilation, unequal access to health care, education and rights of ownership will be examined. The course will consider how multiculturalism is reshaping the public spheres and civil societies of the West with particular implications for women and for gender relations. The module will be

driven by questions relating to the relationships between gender, cultural diversity and global capitalism; how multicultural approaches to social cohesiveness reconceive belonging in gendered ways; and how gender relations affect and are affected by multicultural strategies for negotiating difference

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#### **SO4118 - SOCIOLOGY OF GENDER AND POPULAR CULTURE**

ECTS Credits: 6 (Year 4 Module)

##### **Sociology**

**Rationale and Purpose of the Module:** *a. To provide an opportunity for the student to examine of key theoretical perspectives relevant to the study of gender and popular culture  
b. To offer ways of evaluating the work of major sociological schools/theorists in the study of popular culture and gender studies.  
c. To develop the ability to analyse and interpret popular cultural texts through the lens of gender analysis.*

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

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#### **SO4158 - SOCIOLOGY OF HIGHER EDUCATION**

ECTS Credits: 6 (Year 4 Module)

##### **Sociology**

**Rationale and Purpose of the Module:** *To understand and to explore key theoretical perspectives on higher education*

*To critically engage with examples of empirical research on higher education nationally and internationally*

*To encourage and to enable critical and analytical thinking about the nature and purpose of higher education and its relationship with the state, with industry and with civic society*

*To understand the processes operating within higher educational institutions*

**Syllabus:** This module aims to provide students with an understanding of the sociology of Higher Education internationally and the processes impacting on it, including globalisation, massification; managerialism and masculinisation. It will locate these changes in the context of changing paradigms of Higher Education in Ireland and its nature and purpose. Policies related to Higher Education will be explored in the context of its relationship with the state, the economy and the paradox of gender. The relationship between students social class position; states encouragement of access policies and its perceived elite/non-elite character. Issues related to managerialism versus collegiality; career paths; organisational culture; leadership styles; the gendering of academic and senior management in Irish Universities and internationally; the factors explaining such variation will be explored. Similarities and differences between academic and senior management in Universities and other types of higher education institutions. The future of Higher Education.

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#### **SO4178 - THE SOCIOLOGY OF THE BODY**

ECTS Credits: 6 (Year 4 Module)

##### **Sociology**

**Rationale and Purpose of the Module:** *Aims: This module introduces students to the sociology of the body/embodiment. Key theoretical work is reviewed, incorporating reference to various perspectives from a range of disciplines and approaches (e.g. biology, anthropology, sociology and feminism). Empirical studies in the social sciences, exploring a range of bodily issues and practices, are also considered.*

**Objectives:**

- 1) Locate sociological interest in the body/embodiment within its larger social context.
- 2) Describe and critically assess the main theoretical approaches for studying human embodiment and bodily practices.
- 3) Ground theoretical discussion on human bodies in empirical work from sociology and the social sciences.

**Syllabus:** The module begins by introducing students to social theory on the body and highlights the case for embodying social theory. Sociology is the main disciplinary approach taken for exploring bodies as the source, location and medium of society, but we will first underscore the socially constructed character of the body with reference to broader socio-cultural changes and anthropological research. Attention then focuses on some key themes and debates in late modernity, such as medicalisation, risk, identity, the significance of biology, consumption and gender. More specific substantive lectures will explore themes such as: the obesity debate; disordered eating; cosmetic surgery; sport, physical activity and fitness; bodybuilding and drug-taking; tattooing; piercing; working bodies; sexualities; virtual bodies and cultures of technological embodiment (cyborgs); ageing; disability, chronic illness and healthcare; and, the body as a research instrument.

**SO4208 - SOCIOLOGY OF LOVE AND ITS DARK SIDE**

ECTS Credits: 6 (Year 4 Module)

**Sociology**

**Rationale and Purpose of the Module:** This module examines the different aspects of relationships: love, mate selection and dating, non-marital lifestyles, marriage, reproduction and forms of parenting. A key component of the course is the influence of changing work patterns and changing sexual values and behaviour on increasing diversity in family forms.

The objectives of this module are:

- \* To introduce students to the sociological perspective as it applies to the understanding of relationships and familial phenomena.
- \* To present various sociological theories regarding love,

sexual relationships, marriage and family systems.

- \* To familiarise students with the results of empirical research of social scientists who study partnership formation and family behaviour.

**Syllabus:** The module explores a number of key themes: Trends in family formation and their competing theories; classifications and functions of the family especially in relation to Ireland, past and present; love, sex and courtship, exploring issues of partner choice; marriage and cohabitation, addressing the effects of cohabitation on both nuptiality and fertility; lone-parenting, various paths into and problems faced; separation and divorce, exploring trends across social groups and their correlates; re-marriage and stepfamilies with a particular focus on growing up in a step-family; work and families, analysing power relations within the family in terms of gender roles and housework by discussing a range of contemporary studies of the domestic division of labour especially the impact of increasing male unemployment, the crisis of masculinity, the new man, dual burden/triple shift and the relationship between home and work; the family, state and social policy: the role of social policy and the declining family.

Prerequisites: SO4073, SO4001

**SO4128 - SOCIOLOGY OF THE INTERNET**

ECTS Credits: 6 (Year 4 Module)

**Sociology**

**Rationale and Purpose of the Module:** To develop students appreciation of the value of a sociological perspective on the Internet.

- To familiarise the student with macro and micro-sociological theories applied in and emerging from Internet research.
- To introduce the student to contemporary debates regarding both the impact of the Internet on society and social influences on the Internet.
- To familiarise the student with new methods emerging from Internet research.

**Syllabus:** The aim of this module is to develop students understanding of the manner in which sociology can illuminate the social impact of and social influences on the Internet. Students will engage with different

conceptualisations of the Internet, for example, as a techno-social system. In examining the relationship between the Internet and society, technological determinist perspectives will be contrasted with constructivist explanations. In addition to addressing macro-sociological perspectives on the Internet, this module will also acquaint students with micro-sociological research on such phenomena as identity and community online. Such discussions will incorporate familiarisation with new methods emerging from Internet research. Students will also be introduced to debates regarding e-participation and digital exclusion. This module aims to develop students appreciation of and ability to employ sociological concepts, theories and methods as key tools for investigating the Internet.

**SO4138 - SOCIOLOGY OF RELIGION**

ECTS Credits: 6 (Year 4 Module)

**Sociology**

**Rationale and Purpose of the Module:** To introduce students to sociology of religion in the work of the 'founding fathers and among American sociologists

- To introduce students to the secularisation thesis and the range of positions in debates about secularisation
- To introduce students to debates about gender, sexuality and religion

To critically explore the relationship between globalisation, migration and religion

- To critically examine the rise of fundamentalisms and their relationship to modernity(ies)

**Syllabus:** This module addresses the relationships between modernities and religion by: Considering religion in the work of Marx, Weber, Durkheim and Simmel as a basis for investigating the relevance of their work at the start of the twenty-first century; exploring the focus on religions integrative function in the work of American sociologists such as Parsons, Bergers work on pluralisation and secularisation and Warners rational choice theory; critically examining secularisation theory and process with reference to contemporary debates about post-secular society and global modernity. Substantive issues will also be addressed including

migration and the increasing diversity of religious life, gender, sexuality and religion, religion and civil society and fundamentalisms in the modern world.

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### **SP4148 - MEDIA AND CURRENT ISSUES IN THE SPANISH SPEAKING WORLD**

ECTS Credits: 6 (Year 4 Module)

#### **School of Modern Languages and Applied Linguistics**

**Rationale and Purpose of the Module:** This module is set at C1 on the Common European Framework of Reference for Languages (CEFR).

By the end of this module students should:

- \* have developed further their understanding and command of Spanish grammar, vocabulary and usage.

- \* have improved their ability to use Spanish fluently and accurately and to make brief presentations in the language.

- \* have the ability to identify some of the characteristics of a variety of styles and genres, particularly in the area of media language.

- \* have a greater awareness of issues in translation and an enhanced ability to translate a variety of text types from Spanish to English and vice versa, particularly in the area of media language.

- \* understand more about a variety of issues of central importance to Spain and/or Latin America, with particular reference to the media and to other key aspects of language and society.

- \* have developed a critical understanding of an extended example of modern Hispanic fiction.

**Syllabus:** This syllabus is set at C1 on the Common European Framework of Reference for Languages (CEFR).

The programme is centered around a variety of topics of relevance to students of Spain and Latin America. The intention is to provide variety but a theme running through a substantial part of the module is that of the media and communication. Additionally, there will be attention given to questions of democracy, violence and the rule of law, as well as issues of gender in contemporary society, particularly with reference to the media.

Prerequisites: SP4147

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### **SO4148 - SOCIOLOGY OF POWER: THE RELATIONAL AND PRACTICE**

ECTS Credits: 6 (Year 4 Module)

#### **Sociology**

**Rationale and Purpose of the Module:** To introduce students to sociological debates around how the social order is perpetuated and maintained

To explore the sociological possibilities of negotiating understanding of how social structures/systems and individual actions and their statuses are of equal significance.

To consider the nature of subjectivity, embodiment, rationality and meaning using Bourdieus theory of practice.

To explore the process of 'othering and the debate around discourse or practice.'

To use sociological theories and debates to consider the organisation, reproduction and transformation of social life.

**Syllabus:** This module addresses one of the abiding and core concerns of sociology that is, the nature of social order, and the most appropriate methods to get at this phenomenon. Among the most contentious and demanding aspects of this phenomenon confronted by social theorists are the conceptual demands of capturing and depicting its nature. An exploration of the micro/macro binary offers sociology students the prime possibility of engaging in an intensive logical exploration and elucidation of these categories themselves - ontologically, in the logic of their conceptualisation and in their usage. Webers comparative historical approach at the macro level and the work of symbolic interactionists and ethnomethodologists at the micro level will be introduced to frame and set out the key underlying

tensions as will a phenomenological exploration around intentionality. Bourdieu theory of practice will then be addressed offering the potential of understanding how power and privilege are reproduced bringing together the structural and the subjective in a complex interweaving of the field of relations, the forms of capital and the embodied habitus. An exploration of educational practices in the context of classed relations will offer the possibility of engaging the nature of subjectivity, embodiment, rationality and meaning and considering critiques of Bourdieus work. The process of othering offers a dual possibility of considering the complex nature of power, the reproduction of privilege, daily classification and a consideration of the subtle processes of differentiation and demarcation. This also facilitates an engagement with less prominent aspects of Bourdieus theory that is embodied history and individual strivings for recognition.

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### **SO4218 - SOCIOLOGICAL PERSPECTIVES SEMINAR SERIES**

ECTS Credits: 6 (Year 4 Module)

#### **Sociology**

**Rationale and Purpose of the Module:** The aim of this core module is to provide students with a conceptual understanding of the role of Sociology in contemporary society. Speakers will be drawn from local, national and international organisations and academic departments / institutions in order to share their experience and expertise on the many issues that students will engage with during their degree programme. For those students intending to pursue post-graduate study the module will inform them of the need for and type of sociological research that can best inform the field.

The module will provide the opportunity for students to critically engage in targeted discussion and analysis of key areas of contemporary interest for sociology and their real world applications through presentations and discussions delivered and directed by academics and practitioners. The module will be supported by an assessment in the form of presentation reviews.

**Syllabus:** This module will provide students with a critical insight into the operationalisation of the key

concepts / theories that they have engaged with in their degree programme. The seminars will inform them of key state of the art research findings and methodologies in the discipline. National and international invited speakers will cover targeted topics; including the positive and negative impacts of key policy decisions affecting the field and the central role of sociological research in influencing policy and informing understandings about inequality, social exclusion, social policy, gender, education, globalization, urban regeneration, youth and community.

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#### **SP4248 - SPANISH LANGUAGE, CULTURE AND SOCIETY 6**

ECTS Credits: 6 (Year 4 Module)

#### **School of Modern Languages and Applied Linguistics**

**Rationale and Purpose of the Module:** This module is set at C1 on the Common European Framework of Reference for Languages (CEFR). By the end of this module students should:

- have developed further their understanding and command of Spanish grammar, vocabulary and usage.
- have improved their ability to use Spanish fluently and accurately and to make brief presentations in the language.
- have the ability to identify some of the characteristics of a variety of styles and genres, particularly in the area of media language.
- have a greater awareness of issues in translation and an enhanced ability to translate a variety of text types from Spanish to English and vice versa, particularly in the area of media language.

- have a developing awareness of issues in liaison interpreting and an ability to interpret a variety of text types from Spanish to English and vice versa, particularly in the area of media language.
- understand more about a variety of issues of central importance to Spain and/or Latin America, with particular reference to the media and to other countries

#### **Syllabus:**

This module is set at C1 on the Common European Framework of Reference for Languages (CEFR).

The programme is centered around a variety of topics of relevance to students of Spain and Latin America. The intention is to provide variety but a theme running through a substantial part of the module is that of the media and communication. Additionally, there will be attention given to questions of democracy, violence and the rule of law, as well as issues of gender in contemporary society, particularly with reference to the media.

**Prerequisites:** SP4247

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#### **SP4628 - WOMEN'S NARRATIVES OF RESISTANCE IN THE HISPANIC WORLD**

ECTS Credits: 6 (Year 4 Module)

#### **School of Modern Languages and Applied Linguistics**

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

To develop the students' knowledge of different literary modes in 20th-century Hispanic culture.  
To introduce students to political and testimonial women's writing in the Hispanic World.  
To develop the students' understanding of different literary and political discourses.

*To further develop students' analytical skills, with a special focus on political women's writing.*

**Syllabus:** The module will concentrate on the exploration of women's narratives of resistance to power in different textual modes, from testimony to literature, in order to study the different ways in which women have experienced and represented the oppression/repression of dissidence in colonial, neo-colonial and authoritarian regimes in Latin America and Spain

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

ECTS Credits: 6 (Year 4 Module)

#### **School of English, Irish and Communication**

**Rationale and Purpose of the Module:** To provide students with information on the project management and quality issues in a content development environment, along with practical issues concerning indexing and editing.

To give students an introduction to theory and practice of instructional design and e-learning.

To give students an opportunity to put their learning into practice through a project which incorporates e-learning and project management.

To introduce students to multimedia tools used in content development.

**Syllabus:** This module has two strands: documentation management and instructional design.

The documentation management strand covers: managing complex documentation projects, tools for project management, quality, developing a style guide, editing and indexing, the review process.

The instructional design strand covers: learning theories, needs assessment, audience analysis, objective analysis, media specifications, course design, performance assessment, and delivery systems.

## Irish World Academy of Music & Dance



# Irish World Academy of Music & Dance Year 1 Modules

## MU4002 - CRITICAL ENCOUNTERS WITH POPULAR MUSIC AND DANCE

ECTS Credits: 6 (Year 1 Module)

### Humanities

**Rationale and Purpose of the Module:** This module is an introduction to the growing field of popular music and dance studies and will give the student an overview of some of the important features of these contemporary practices 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. Students here will also be introduced to responsible and accountable academic and research practices

**Syllabus:** In this module students will be introduced to the academic field of popular music and dance studies, examining popular music and dance movements, particularly those relevant to Irish contexts. Here students will seek to develop a vocabulary to think, talk, and write about the world of popular music/song/dance in order that we might better understand the purpose, meaning, and values associated with its forms. By examining case studies and key writings about popular music, song, and dance, students are introduced to the theoretical models developed within the field to account for the development of popular music and dance (and the very concept of 'popular' itself), the role of commodification in popular arts and how that shapes its aesthetics, and the meaning of popular forms in identity politics and in our everyday lives. 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.

## MU4012 - CRITICAL ENCOUNTERS WITH WESTERN ART MUSIC AND DANCE

ECTS Credits: 6 (Year 1 Module)

### Humanities

**Rationale and Purpose of the Module:** This module is an introduction to the field of classical music dance studies, with a particular focus on contemporary practices. Students will be exposed to a selection of classical music and dance practices in an academic and performative context, providing them with an insight into some of the diversity of music and dance practices within these traditions. The investigations presented in this module will be particularly informed by the international disciplines of Arts practice research. Students here will also be introduced to responsible and accountable academic and research practices.

**Syllabus:** This module will act as an introduction to the historical development of Western Art Music from its roots in medieval church and secular music to its contemporary forms. Its historical relationship to traditional musics in Europe and beyond will be discussed.

Dance traditions will also be explored, referencing classical, neo-classical, contemporary and post-modern dance artists and practices. The course will include aspects of the history of dance performance in other locations and environments, for example site specific works, choreography for camera and the influence of new technologies on the development of choreography and performance. 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.

## MD4102 - PERFORMANCE 2A

ECTS Credits: 6 (Year 1 Module)

### 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

one Performance 1A module and as such 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.

## MD4111 - Irish World Academy Practicum C2

ECTS Credits: 6 (Year 1 Module)

### Humanities

**Rationale and Purpose of the Module:** This module will continue to focus 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. Students will have the option to build on cross-genre skills acquired in Practicum C1 in certain contexts. The title of the module reflects the Irish World Academy tradition of presenting modules with a 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 pace within their own discipline, mentored by faculty and tutors, to develop creative, collaborative work within and extending from their own disciplines and genre practices. The second half of this module is designed to facilitate 'cross-arts' exploration of creative practice as a core dimension of every Academy undergraduate's educational experience. Each student will choose 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 in certain contexts.

**MU4022 - INTRODUCTION TO SONGWRITING 2**

ECTS Credits: 6 (Module Years 1-4)

**Humanities**

**Rationale and Purpose of the Module:** Students will build on skills and experiences, composing within a group as well as developing their individual practice as songwriters.

**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. Moving on from Introduction to Songwriting 1, students will now be expected to produce individual as well as group compositions for performance.

**MD4122 - AERIAL DANCE CREATIVE LAB**

ECTS Credits: 6 (Module Years 1-4)

**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. Creative Lab is an integral part of aerial dance as it uses the performance skills and tools developed to create an aerial solo or group piece. This module focuses on creativity within choreography, and on building and working towards aerial acts, including individual, duo and trio performance pieces.

**Syllabus:** Creative Lab is an integral part of aerial dance as it uses the performance skills and tools developed to create an aerial solo or group piece. This module focuses on creativity within choreography, and on building and

working towards aerial acts, including individual, duo and trio performance pieces. Students learn sequences and then improvise with it, using other choreographic skills for working on material. Students will also learn how to move with the trapeze or cocoons spinning, circling, swinging and changing heights. This module develops ease in moving in and out of the floor and in and out of the aerial apparatus as it spins and swings. It also develops each student's creative ethos and thinking by working through different exercises originating in theatre, dance and clowning to overcome blocks and fears in performance.

**MD4142 - IRISH DANCE PERFORMANCE SKILLS 2**

ECTS Credits: 6 (Module Years 1-4)

**Humanities**

**Rationale and Purpose of the Module:** To enable students whose first area of practice is not Irish dance to continue to develop their Irish dance skill set .

**Syllabus:** Continued development of Irish dance skills to include travel steps, foot work, rhythm and an understanding of interpreting the music. Basic posture, footwork and musicality will be addressed relevant to the students' ability.

## Irish World Academy of Music & Dance Year 2 Modules

**MD4114 - CRITICAL ENCOUNTERS WITH GLOBAL POP**

ECTS Credits: 6 (Year 2 Module)

**Humanities**

**Rationale and Purpose of the Module:** This module is a further engagement with the study of popular music, emphasising its internationality as a domain for the circulation of many varied genres with origins around the world. "Irish trad," as it is commonly called, is a significant idiom within this field and here is placed in its international context as but one example of local-global-local, sometimes called glocal (or occasionally LobaL),

interaction. Global Pop is a field of musical production with which our students are likely to interact as musicians and dancers; this module prepares them to act as critical thinkers about its practices and their engagement with these.

**Syllabus:** The module content focuses on understanding the volatile dynamics of this field of cultural production through the study of particular examples. Some of the most important, and well documented, in this regard have been musics from Black America, South America, the Caribbean, North Africa, Sub-Saharan Africa, South Africa, Southeast Asia, Native North America, and the Northern Circumpolar regions. Particular issues and concepts key for an understanding of this phenomenon will be addressed in the context of these examples. Using an arts practice research perspective students will be asked to reflect on their own experience, most often in Irish music, in this domain.

**MU4034 - DANCE IN HEALTH 1**

ECTS Credits: 6 (Year 2 Module)

**Humanities**

**Rationale and Purpose of the Module:** This module provides basic skills and knowledge to allow dancers to work in healthcare settings, under the supervision of, and in collaboration with, medical healthcare professionals. The content will cover practices that promote a healthy and mindful approach to movement while also helping dancers apply their knowledge for use across a range of healthcare situations. This module will provide preparation for clinical placement (MODULE CODE) and contextualization, through theory and studio-based practice. The continued development of an integrated mind/body approach will enable students to facilitate appropriate and effective dance classes for multiple populations to increase: mobility, cardiovascular function, agency and expression, while minimizing risk of injury.

**Syllabus:** This module provides basic skills and knowledge to allow dancers to work in healthcare settings, under the supervision of, and in collaboration with, medical healthcare professionals. The content will cover practices that promote a healthy and mindful approach to movement while also helping dancers apply their knowledge for use across a range of healthcare situations. This module will provide preparation for

clinical placement (Module 2) and contextualization, through theory and studio-based practice. The continued development of an integrated mind/body approach will enable students to facilitate appropriate and effective dance classes for multiple populations to increase: mobility, cardiovascular function, agency and expression, while minimizing risk of injury.

#### **MU4043 - VOCAL PEDAGOGY** ECTS Credits: 6 (Year 2 Module)

##### **Humanities**

**Rationale and Purpose of the Module:** *This module is an introduction to the expanding, interdisciplinary field of vocal pedagogy and will provide the student with an overview of arts based and scientific approaches to vocal pedagogy. The student will critically engage with key pedagogical texts and discuss current research in the field.*

**Syllabus:** This module will offer an introduction to contemporary, arts based and scientific perspectives on vocal pedagogy, surveying key Western pedagogical approaches and presenting recent research in the field. The module content will provide the student with an opportunity to critically engage with the interdisciplinary perspectives that enrich discourse in this area on an ongoing basis, offering an informed foundation in care of the professional voice.

#### **MU4054 - MUSIC COMPOSITION 2** ECTS Credits: 6 (Year 2 Module)

##### **Humanities**

**Rationale and Purpose of the Module:** *Music Composition 2 develops students engagement with a range of contemporary acoustic and electronic music composition practices, with the aim of deepening each student's individual composition practice. Composition practices from within and outside of oral traditions, both score-based and non-score-based, are explored.*

**Syllabus:** Students expand their engagement with a range of approaches to music composition, broadening

their experience of diverse compositional concepts, methods and techniques, towards the development of their own distinctive creative practice. Students also develop their skills in peer learning.

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#### **MU4084 - SECOND INSTRUMENT STUDIES FOUR** ECTS Credits: 6 (Year 2 Module)

##### **Humanities**

**Rationale and Purpose of the Module:** *This module allows students on the BA Irish Music / BA Irish Dance / BA World Music / BA Contemporary Dance / BA Voice to further develop performance skills in a instrumental skill (including voice) secondary to their main performance practice at the Irish World Academy. 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 Irish Music / BA Irish Dance / BA World Music / BA Contemporary Dance / BA Voice and is subject to the Irish World Academy being able to source appropriate expertise and resources.*

**Syllabus:** Students in this module will continue to develop a second instrumental performance area in small group and one-on-one contexts. Students will develop and document an appropriate practice regime as well as use reflective tools such as auto-ethnographic journals. Students will generate a short public performance which will play a part in the assessment of this module.

**Prerequisites:** MU4018

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## **Irish World Academy of Music & Dance Year 3 Modules**

#### **MD4093 - CLASSICAL MUSIC STUDIES**

**ECTS Credits:** 6 (Years 3 & 4 Module)

##### **Humanities**

**Rationale and Purpose of the Module:** *This module will provide the student with methods for the analysis of musical works, styles, and key composers within Western classical music, taking into account the social and cultural contexts of the time periods studied.*

**Syllabus:** This module will offer a critical engagement with historical and contemporary perspectives on classical music, introducing the student to compositional form and style in both vocal and instrumental music.

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#### **MU4013 - RESEARCH SKILLS: ETHNOMUSICOLOGY/ETHNOCHOREOLOGY/ARTS PRACTICE**

**ECTS Credits:** 6 (Year 3 Module)

##### **Humanities**

**Rationale and Purpose of the Module:** *To introduce students to the important contextualising disciplines of ethnomusicology and ethnochoreology and their main principles and orientations as well as the practical application of fieldwork and the production of ethnographic representations.*

*To introduce students to work primarily in an analytical writing mode to explore conditions, concepts, and practices of performing arts in the 21st century.*

**Syllabus:** To introduce students to the important contextualising disciplines of ethnomusicology and ethnochoreology and their main principles and orientations as well as the practical application of fieldwork and the production of ethnographic representations.

An emphasis is given to the performance of fieldwork and the representation of experiences and findings that can be utilised in, for example, FYP work.

To introduce students to work primarily in an analytical writing mode to explore conditions, concepts, and practices of performing arts in the 21st century including the generation of meaning and value(s) through performance; the domain of artistic practice as reflexive activity; the challenges of representation, translation and archiving of artistic practice.

**MU4106 - ARTS AND HEALTH**  
ECTS Credits: 6 (Year 3 Module)

**Humanities**

**Rationale and Purpose of the Module:** This module is designed to enable music and dance students to develop awareness and understanding of the impact of the arts on health and well-being. The module aims to develop well-rounded music and dance graduates who are aware of the role of the arts in various contexts (such as hospital, community healthcare and mental health) and the impact of their own health and well-being on their own arts performance. The role of arts in society will be examined as well as the wide variety of approaches to creative engagement and the value of art.

**Syllabus:** In this module students will develop their knowledge of the interaction of arts, health and well-being. Students will discuss, describe and critically reflect on the ways theorists and researchers have considered social, psychological, physical and behavioural aspects of the arts and to discuss the role of the arts in society and the value of art. By the end of the module students will be able to describe aspects of physiological responses to music; the social and cultural context of music and dance; the importance of listening skills, arts and health practice.

**MU4136 - IRISH TRADITIONAL MUSIC 2**  
ECTS Credits: 6 (Year 3 Module)

**Humanities**

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

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

**Irish World Academy of Music & Dance Year 4 Modules**

**MD4094 - MUSIC, LANGUAGE, SIGN AND TEXT**  
ECTS Credits: 6 (Year 4 Module)

**Humanities**

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

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

**MU4004 - MATERIALS AND CONTEXT FOR VOCAL PERFORMANCE**  
ECTS Credits: 6 (Year 4 Module)

**Humanities**

**Rationale and Purpose of the Module:** Students will be introduced to the tools and approaches of choral music analysis and arrangement. They will also learn to access, assess and transcribe original and edited sources of vocal music (solo and ensemble), and will be introduced to the principles and practices of vocal performance and staging.

**Syllabus:** Students will attend lectures that will cover the theoretical aspects of choral music analysis and arrangement for two, three and four parts. Another set

of lectures will be dedicated to the introduction and study of original and edited sources of vocal music. Students will also attend a laboratory where principles and practices of vocal performance in relation to staging (including stage presence, lighting and spacing) will be introduced.

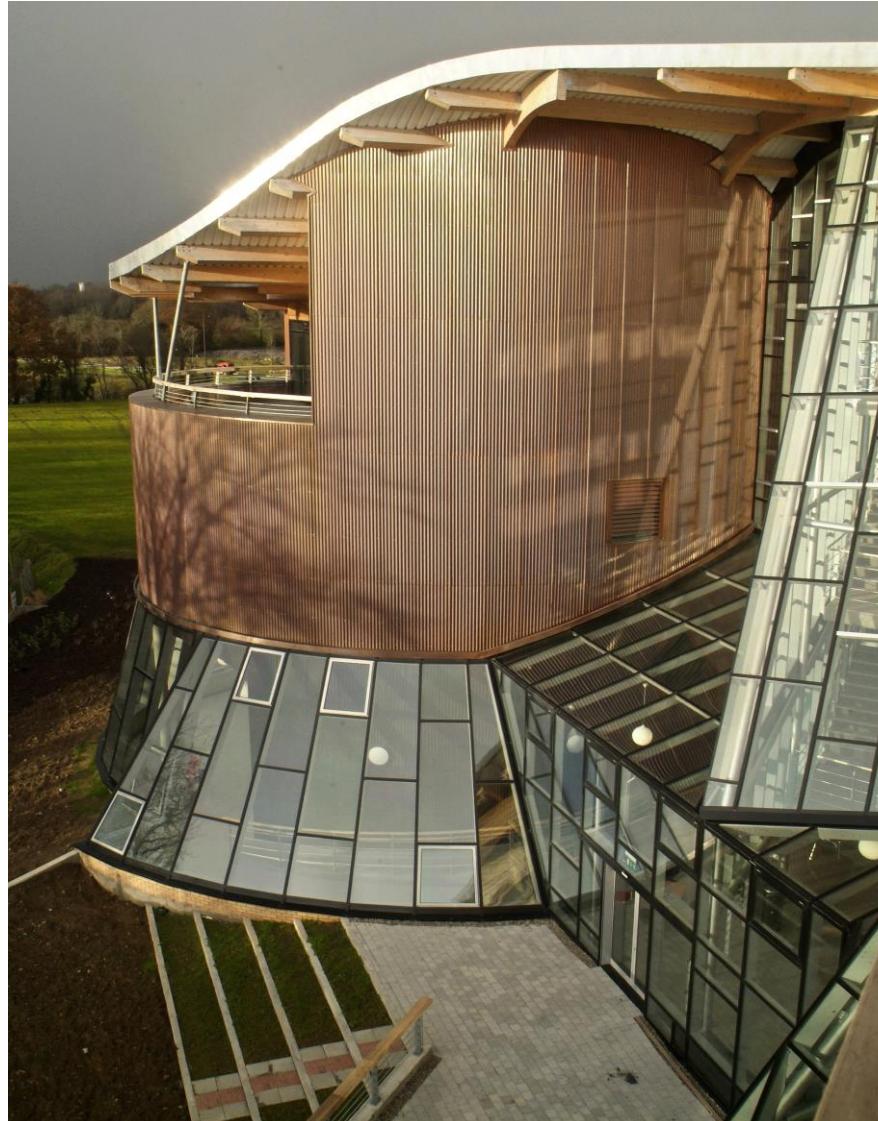
**MU4008 - SPECIAL TOPICS IN ETHNOMUSICOLOGY**  
ECTS Credits: 6 (Year 4 Module)

**Humanities**

**Rationale and Purpose of the Module:** This module is designed to give advanced undergraduate students the opportunity to explore a particular topic in an in-depth way not possible in introductory or survey modules. Specific topics will be chosen by the faculty member coordinating the module and will generally be research based. It is intended to serve as a recruitment stepping stone taking 4th year undergraduates into considering post-graduate studies in the international field of ethnomusicology.

**Syllabus:** Students will work primarily in a tutorial and collaborative setting developing and implementing current, higher level research led by individual faculty members. Students will support primary investigators as collaborators in making research and its dissemination at a professional level. Students will engage individual, departmental and institutional research strategies and gain an insight into best practices in ethnomusicological research in a wider, collaborative context.

## Faculty of Education and Health Sciences



# School of Allied Health

## Year 1 Modules

### BR4071 - BROADENING: EXPLORING THE BRAIN AND UNDERSTANDING BEHAVIOUR

ECTS Credits: 6 (Year 1 Module)

#### School of Allied Health

**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 about the brain and how it influences a range of common human behaviours in daily life. The brain is central to human behaviour in everyday life, and this module seeks to bring this concept to life in a way that is both engaging and allows students to critically evaluate key types of evidence in current cognitive and social neuroscience. Diverse learning strategies will be employed that include practical learning, online lab experiments as well as the more traditional lecture and tutorial formats. Students will engage and experience how the brain works and what role it has in core functions such as vision, learning, language, and memory

**Syllabus:** Understanding the brain; history and methods.

The seeing brain: visual processing and impairments, visual cognition, visuomotor planning and action

The spatial brain: spatial cognition, attentional control, inattentional blindness, the trouble with intuition

The acting or doing brain: motor cognition, development of skills and expertise, movement behaviour, mirror neuron hypothesis.

The feeling brain: effects of psychoactive drugs, understanding anxiety and depression

The remembering brain: working memory, remembering and forgetting, false memories, amnesia, and metacognition.

The interacting brain: ape talk, language, non-verbal interaction, theory of mind,

The social and emotional brain: social cognition, facial expression of emotion, processing emotions.

The developing brain: sensitive periods, innate knowledge, nature versus nurture

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### PR4002 - ANATOMY 2

ECTS Credits: 12 (Year 1 Module)

#### School of Allied Health

**Rationale and Purpose of the Module:** This module will build on basic anatomical concepts taught in Anatomy 1 module and provide a comprehensive knowledge and understanding of the structure and function of the anatomy of the upper limb, face, head, neck, brain and spinal cord that will be further developed in subsequent clinical modules. This module will enable students to understand the functional relevance of all anatomical structures covered in this module and to appreciate the significance of interrelationships of structures to function.

The total hours scheduled will be 96 (based on 3hrs lectures, 3hrs labs and 2hrs tutorials over 12 weeks)

**Syllabus:** Structure, functional & applied Anatomy of the upper limb - muscles, joints, nerves; shoulder girdle, shoulder joint, elbow joint, radio-ulnar joints, wrist, hand and finger joints; Analysis of basic functional activities involving upper limb.

Structure, functional & applied Anatomy head, neck, face (temporomandibular joint), brain and spinal cord (cns + peripheral ns)

Nervous control of muscle tone and posture: cranial nerves: myotomes and dermatomes and reflexes of upper limb.

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### PY5021 - EVIDENCE BASED PRACTICE

ECTS Credits: 12 (Year 1 Module)

#### School of Allied Health

**Rationale and Purpose of the Module:** This proposed module is a distance eLearning format of PY5021 which will permit students to opt either to complete a module on evidence based practice via lectures and tutorials on campus in semester 2 of the academic year, or by eLearning in Semester 1. Module PY5021 Evidence based practice is a mandatory requirement for the post graduate certificates offered by the Department of

**Clinical Therapies.** The module equips students with the skills and knowledge to adopt evidence based practice (EBP). High quality service provision requires that the most current relevant research is combined with experiential learning and service users preferences. This module will enable students to source and critically appraise the research, reflect on their practice and synthesise this knowledge to address service requirements. The students will also gain an understanding of the barriers and facilitators in implementing EBP in the workplace.

**Syllabus:** Introductory day on campus to ensure students are able to access and use electronic resources. Series of keynote topics delivered on-line and supported by a discussion forum, group work and tutorials on the different facets of EBP; defining a service question, searching for and appraising the most current literature, integration and synthesis of information to address service needs and the implementation in practice. Evaluation of changes in work practices.

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# School of Education

## Year 1 Modules

### EN4022 - EDUCATIONAL TECHNOLOGY FOR TEACHING AND LEARNING

ECTS Credits: 6 (Year 1 Module)

#### School of Education

**Rationale and Purpose of the Module:** This module introduces students to various forms of educational technology. The module provides participants with both the practical and pedagogical skills to integrate these technologies into their teaching. The module also provides students with relevant policy and professional issues related to ICT use in educational settings. A core focus of the module is to empower students to capitalise on the personal, social and educational benefits of the technologies whilst recognising the critical questions raised by an increasingly technological society.

**Syllabus:** Reconceptualising teaching and learning in the context of ICT; rationale for the integration of educational technologies in schools; national and

international policy trends in educational technology; critical perspectives on educational technology; deconstructing the 'net generation'; critical media literacy; cyber bullying and child welfare issues; information security and legislative requirements; productivity tools for teachers; teacher and student generated content (wikis, podcasting, video content); technologies in the classroom; assistive technologies in education; Communication and collaborative learning technologies (LMS platforms in schools, Social media in education); ICT planning and leadership; use of ICT in supporting independent learning; Evidence-based uses of technologies in the classroom; emerging trends and technologies in education

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#### **EN4032 - UNDERSTANDING YOUNG PEOPLE AND HOW THEY LEARN**

ECTS Credits: 6 (Year 1 Module)

#### **School of Education**

**Rationale and Purpose of the Module:** *The purpose of this module is to introduce students to key concepts in developmental psychology and how young people learn. The module will provide students with a critical understanding of key learning theories, examining behavioural, cognitive and constructivist theories from both a historical and contemporary perspective. Students will gain a critical understanding of relevant aspects of adolescent development and their applications to teaching, learning and assessment.*

**Syllabus:** Seminal and contemporary learning theories including behavioural, cognitive constructivist and bio-ecological accounts of learning; Adolescent Development (physical, cognitive, social/emotional); Factors to be considered in understanding student learning: personality, intelligence, attention, memory, thinking and problem solving, language and literacy development, metacognition; attributions; motivation

## **School of Education**

### **Year 3 Modules**

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#### **EM4006 - SUBJECT PEDAGOGICS 2 (MATHEMATICS)**

ECTS Credits: 6 (Year 3 Module)

#### **School of Education**

**Rationale and Purpose of the Module:** *This is the second subject pedagogics module in mathematics and is devoted to applying the trainee teachers general pedagogical knowledge and developing mathematics-specific pedagogical knowledge. The module attempts to integrate three strands concurrently (a) a theoretical mathematics education strand focusing on the mathematics education curriculum (b) aspects of the psychology of mathematics teaching and learning (c) practical preparation for school-based practice.*

**Syllabus:** LECTURE TOPICS: (2x13 weeks)

Mathematics and Learning; Learning theories and mathematics; Mathematical thinking; Assessing Mathematics learning; Classroom Practice; International Perspectives; Senior Cycle Maths Curriculum.

SEMINARS:(1x5 weeks) Student groups (1 presentation per group)

Using resources effectively; Assessing mathematical learning; Self-appraisal for mathematics teachers; Professional practice; Senior Cycle mathematics; Assessment approaches/practices; Teaching strategies; Designing a maths curriculum for a specific target group; The use of technology in maths teaching; Problem solving and modelling in secondary mathematics teaching; Teaching algebra; Teaching geometry; Proving in mathematics; Teaching proof and proof techniques; Learning theories in mathematics education; Research perspectives in mathematics education; Student choice (to be approved).

WORKSHOPS/MODEL LESSONS Student Groups (1 presentation per group)

Group Brief: Develop and present to peers 30min model lesson for target senior cycle group. Lesson will be discussed and evaluated by panel of peers chaired by lecturer

Prerequisites: EM4004

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#### **EN4026 - INCLUSIVE EDUCATION 2: SPECIAL EDUCATIONAL NEEDS**

ECTS Credits: 6 (Year 3 Module)

#### **School of Education**

**Rationale and Purpose of the Module:** *Successful inclusion of students with special educational needs is underpinned by positive teacher attitudes and a capacity to differentiate appropriately. This module aims to enhance students' understanding of inclusion and to develop their capacity to identify and respond to students' special educational needs collaboratively and within a whole school framework.*

**Syllabus:** Knowledge of key national and international policy and legislative documents that pertain to special educational needs in Ireland; identification and assessment of need across cognitive, physical and emotional/behavioural domains; effective writing of individual education plans; knowledge and application of evidence based strategies in the area of SEN; understanding and support of SEN within a whole-school framework; collaboration with key stakeholders (e.g. parents/students) and a multi-agency approach to the inclusion of young people with SEN; experience of an alternative educational experience.

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#### **EY4016 - SUBJECT PEDAGOGICS 2 (ENGLISH)**

ECTS Credits: 6 (Year 3 Module)

#### **School of Education**

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

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

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#### **EY4076 - SUBJECT PEDAGOGICS 2 (ENGINEERING TECHNOLOGY AND GRAPHICS)**

ECTS Credits: 6 (Year 3 Module)

## School of Education

**Rationale and Purpose of the Module:** Building on the attitudes, skills and knowledge associated with technology education and consolidating the experience from School Placement 1, the focus of this module shifts from that of a teacher-centred planning model to an orientation phased focus of pedagogical development. This module takes a more flexible and inclusive approach to pedagogical design and implementation. The emphasis is to develop both proactive and responsive techniques in an attempt to develop dynamic thinking capacities appropriate to the complex and iterative nature of technology teaching and learning. With particular emphasis on cognitive architecture, primarily memory systems, this module explores the design, intent, and efficacy of learning tasks and activities. Methods for qualifying efficacy are developed through statistical and self/peer audit techniques so as to support reflection and improvement. Special consideration is given to planning for differentiation and alternative educational needs.

**Syllabus:** Analysis of the leaving certificate Technology, Engineering, and Design and Communication Graphics syllabi, Task Design: learning curves, progressive planning, task design, memory systems, cognitive load theory, mixed ability, planning for differentiation, Personal Development: personal construct of capability, exercising professional judgement, identification of cognitive and meta-cognitive actions, formative and diagnostic assessment, principles of evidence based practice, Strategies: managing permeable and non-permeable task design, divergent outcomes, learner support, quality assurance and improvement Assessment strategies: definition of capability, design of assessment instrument, evaluating competencies.

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### SE4016 – ADVANCED SCIENCE PEDAGOGY ECTS Credits: 6 (Year 3 Module)

## School of Education

**Syllabus:** TBC

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## Year 4 Modules

### EN4018 - TEACHER AS PROFESSIONAL

**ECTS Credits:** 6 (Year 4 Module)

## School of Education

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### MB4008 - GROUPS AND ALGEBRAIC STRUCTURES

**ECTS Credits:** 6 (Year 4 Module)

## School of Education

**Rationale and Purpose of the Module:** To develop a broad understanding of algebraic structures especially group structure.  
To study realizations of group structure in geometry.  
To study selected applications in Science and Engineering.

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

**Prerequisites:** MB4001, MB4002

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### PN4038 - DESIGN AND COMMUNICATION GRAPHICS 6

**ECTS Credits:** 6 (Year 4 Module)

## School of Education

**Rationale and Purpose of the Module:** The importance of graphicacy in developing well-balanced citizens stimulates significant debate and discussion within education. Exploring and learning through the medium of graphics begins in early childhood and continues throughout adult life. The role of the education system in developing and nurturing graphical skills is sometimes understated. This module will broaden and develop students' capacity to critically think about their discipline while bringing their knowledge and understanding of graphics to bear on real world problems and challenges. Invited speakers from a range of disciplines (including medicine,

humanities, sciences, engineering, etc.) will present their real world graphical experiences and observations through a series of short presentations. In addressing the issues raised in these presentations, students will be expected to be proactive and creative in identifying and driving improvement and positive change to enhance the competencies of these professions through graphicacy. Through a needs analysis, students will autonomously develop, create and innovate towards realising new possibilities and opportunities that enhance graphical capability and professional performance. On completion of this module, students will be expected to professionally and effectively convey ideas relating to the development of graphical capability. As future educators and agents for change, students will also be expected to debate and support the role of graphical education in making substantial and positive contributions to society and active citizenship.

**Syllabus:** Design and Communication Graphics: Graphicacy, creative problem solving, spatial abilities/visualization, design capabilities, decision-making capabilities, graphical encoding and decoding, cognitive modelling skills, Research methods in Technology Education: classroom case studies, repertory grid technique, expertise development, observational techniques, visual and verbal protocol analysis, capturing knowledge and heuristics, examining graphical thinking

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## Department of Physical Education & Sport Sciences Year 1 Modules

### BR4081 - BROADENING: ACTIVE BODY, ACTIVE MIND

**ECTS Credits:** 6 (Year 1 Module)

## Physical Education & Sport Sciences

**Rationale and Purpose of the Module:** This module is part of the Broadening the Curriculum Agenda here in UL for creating interdisciplinary modules as part of the UL Strategic plan and specifically is designed to enable students to evaluate the importance of health for optimal learning, educational achievement and personal

*development and appreciate the relationship between an active body and active mind. Through engaging in diverse learning strategies that include practical learning as well as the more traditional lecture and tutorial format, students will experience first-hand the interplay of physical, mental, social and emotional dimensions of learning for health. It will encourage students to integrate the important concepts of an active lifestyle for physical and mental health, well-being and academic achievement. In addition, the module aims to take students beyond traditional understandings of health and learning and to apply their new knowledge to create sustained cognitive, emotional and behavioural change for improved learning and health gains.*

**Syllabus:** Students will be provided with content and opportunities that allow them to engage in physical activity and learning in a fun, creative, challenging and social context. Through the introduction of different physical activities using the UL campus environment (e.g., team challenges, orienteering, walking, aquatics, sports, dance) students will become aware of the common currency of physical activity not only from a group perspective but also with respect to the level of autonomy individuals have in determining their own active lifestyles. The module provides students with an opportunity learn from an interdisciplinary and intradisciplinary perspectives how to make decisions from a collective group perspective as regards the determinants of being physically active and also accomodate space for students to identify their own motives/ motivational climate in considering and maintaining an active lifestyle. Behavioural change models (e.g., the transtheoretical model/ stages of change model) provide the framework for students to conceptualise and measure active lifestyles of the student population as well as their own. Additionally, this framework can facilitate promotion strategies for individuals and groups. Attention will also be given to the environment in which activity occurs focusing on aspects of contextual intelligence. In addition to enhancing their physical health, the module will also challenge students to become critically aware of their learning styles, their personal study habits and the link between physical activity and improved motivation and learning success.

## **SS4142 - SCIENTIFIC PERSPECTIVES OF SPORT AND EXERCISE PSYCHOLOGY**

**ECTS Credits: 3 (Year 1 Module)**

### **Physical Education & Sport Sciences**

**Rationale and Purpose of the Module:** *The module aims to introduce key theoretical and applied concepts in sport and exercise psychology. In addition the module will provide a foundation in the methods, issues and application in sport and exercise psychology.*

**Syllabus:** Psychology as a scientific discipline and mode of enquiry to investigate the mind and behaviour. Major concepts studied in psychology (e.g. personality, motivation, stress, attention, perception, memory, learning, nervous system). Methodologies employed in psychology and the changing scientific paradigms. Evolution of sport and exercise psychology. Psychological skills training, Psychology of physical activity and health. Relevance of psychology to sport coaching and participation in physical activity. Psychology and skill acquisition. Professionalisation of the discipline and applications.

## **SS4332 - INTRODUCTION TO BIOMECHANICS FOR SPORT AND EXERCISE**

**ECTS Credits: 3 (Year 1 Module)**

### **Physical Education & Sport Sciences**

**Rationale and Purpose of the Module:** *Module created due to restructure of Year 1 of the BSc Sport and Exercise Sciences programme. Originally this module (SS4304) was a week 1-15 6 ECTS module and is now being changed to a week 7-12 3 ECTS module to suit the restructure.*

**Syllabus:** Introduction to segmental modelling techniques including cadaver dissection data. Centre of mass centre of pressure, centre of gravity and radii of gyration. Fluid mechanics and air flow effects with applications to cycling, skiing, and aquatics. Friction. Angular momentum. Stability & balance. Analysis of specific movements; including Walking and running, diving, throwing and striking skills, jumping and throwing and sprint start.

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## **PY4102 - INTRODUCTION TO FUNDAMENTAL MOTOR SKILLS**

**ECTS Credits: 3 (Year 1 Module)**

### **Physical Education & Sport Sciences**

**Rationale and Purpose of the Module:** *Fundamental motors skills are foundational to participation in physical activity for a lifetime and engagement with more complex sport forms. The purpose of this module is to equip students with the skills, knowledge, and attitude regarding fundamental motor skills to enhance their participation and that of others.*

**Syllabus:** Fundamental motor skills are generic motor activities with specific observable patterns. They encompass one stage in motor skills development, occupying a place between rudimentary movement skills and the development of sport specific skills. This module will examine the development of selected fundamental motors skills. The fundamental motors skills to be included are those considered to be critical to the majority of future participation.

Specific content will include:

1. Development of competence
  - a. Locomotor skills (walk, run skip, gallop, leap, hop, slide)
  - b. Throwing
  - c. Catching
  - d. Stiking with the hand
  - e. Kicking
  - f. Jumping (horizontal and vertical)
  - g. Landing
  - h. Balance (static and dynamic)
  - i. Rolling
2. Identification of critical elements of selected fundamental motor skills
  - a. Feedback
  - b. Analysis
3. Importance of fundamental motor skills
  - a. Participation
  - b. Social competence
  - c. Attitude
  - d. Self-confidence

4. Overview of issues with teaching
    - a. Time
    - b. Feedback
    - c. Environment
- 

#### **PY4112 - PHYSIOLOGY AND ANATOMY AND PEDAGOGY OF HRA**

*ECTS Credits: 6 (Year 1 Module)*

#### **Physical Education & Sport Sciences**

**Rationale and Purpose of the Module:** *This course is a unique opportunity to become familiar with key concepts in kinesiology, the study of human movement, and physiology, the study of how the body functions. It will also examine the role of physical activity (PA) and related themes (link with sport, health, etc.), while particular emphasis will be placed on the role of Health-Related and Skill-Related Fitness (HRF / SRF) in Physical Education (PE). To enable students to understand the basic anatomy of the musculo-skeletal system and how the system functions in normal motion such as walking gait. To enable students to understand the basic physiology of the systems which support movement in the body.*

*Apply the concepts to a physical education/ activity environment.*

#### **Syllabus:** Anatomical terms and definitions.

Identification and functions of the musculo-skeletal system. Structure and type of bones and muscles. Kinesiological analysis of simple joint movements and analysis of posture. Forms of motion. The nervous system and the brain; nerve structure and function, nerve transmission; the action potential, the neuromuscular junction, neurotransmitters; The central nervous system, the peripheral nervous system, autonomic and somatic nervous systems. Structure and function of muscle fibres; organisation into motor units; Motor unit recruitment in muscle contraction. Functional properties of muscle. The circulatory system; structure and function of the heart; blood vessel structure and function; blood pressure and its measurement. The respiratory system; structure and function of the upper respiratory tract, the lungs, pulmonary ventilation, and pulmonary gas exchange. Practical application will include an introduction to the concept and application of fundamental movement skills, in addition to the various

components of HRF & SRF; an introduction to, and personal experience of, field tests for both; warm up and cool down procedures; health appraisals and screening; components of physical fitness (PF); principles of training specific to HRF and PF; and field tests for physical fitness. Principles of effective measurement (validity, reliability, safety, objectivity, etc.) will play a key role throughout this course and this will become particularly evident during physical assessments and testing. Students will also be introduced to the concept of a personal profile and all related issues that combine to create such a synopsis of an individual's physical status (assessment results, change over time, training log, etc.).

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#### **SS4422 - EXERCISE AND FITNESS**

*ECTS Credits: 3 (Year 1 Module)*

#### **Physical Education & Sport Sciences**

**Rationale and Purpose of the Module:** *To provide students with a foundation and understanding of effective prescription of exercise/physical activity for health and sport performance.*

**Syllabus:** Structure, phases and components of cardiovascular endurance and resistance (body, machine and weights) training sessions. Safe selection, structuring and teaching of appropriate exercises. Adaptations and progressions. Application of training principles. Safety guidelines. Pedagogical aspects of class management. Basic weight training schedules. Monitoring intensity. Exercise to music.

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## **Department of Physical Education & Sport Sciences Year 2 Modules**

#### **PY4055 - SOCIOLOGICAL CONCEPTS OF TEACHING AND LEARNING IN PHYSICAL EDUCATION**

*ECTS Credits: 3 (Year 2 Module)*

#### **Physical Education & Sport Sciences**

**Rationale and Purpose of the Module:** *This module introduces socialisation into and through physical education and the role of the physical educator. Students are encouraged to reflect on their own socialisation into the role of physical education student and how this impacts on their understanding of physical education. This module also focuses on issues of social development (e.g. gender, social class, disability and racism). These topics are examined in light of how they have affected and are currently affecting the teaching of school physical education.*

**Syllabus:** Topic include: socialisation, roles, interaction, identity and sociology of the body. Issues of social development are included such as: gender, race & ethnicity, religion, sexuality, family support, socio-economic status, social power. Also included is an introduction to the sociology of sport, with an emphasis on violence in sport and the implications on teaching school physical education.

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#### **PY4084 - PEDAGOGY OF LIFETIME PHYSICAL ACTIVITIES**

*ECTS Credits: 3 (Year 2 Module)*

#### **Physical Education & Sport Sciences**

**Rationale and Purpose of the Module:** *The rationale for this module centres on a commitment to putting learners' needs and interests at the centre of curriculum planning and a willingness to think 'outside the box' by exploring new pathways for post-primary physical education. Specifically, in this module pre-service teachers will be introduced to lifetime physical activities (LPAs) and how they can be included within the physical education curriculum. LPAs will include, but are not limited to, yoga, Pilates, Tai Chi, power/hill walking, boxercise, step aerobics, rock climbing, disc golf, Ultimate, roller skating and bowling. Pre-service teachers will become familiar with and be able to participate in these various LPAs; further informing what they believe is worth learning and assessing within physical education. Pre-service teachers will be directed to address these central topics in their continued preparation of schemes of work and lesson plans for year*

2 school placement.

The purpose of this module is as follows:

1. To allow pre-service teachers to become familiar with various ways of looking at curricula which encourage lifetime physical activities as part of the (Irish) post-primary physical education curriculum.
2. To acquaint pre-service teachers with how learning by individual pupils can be facilitated through lifetime physical activities. 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 conduct and apply relevant research as appropriate to pre-service teachers' teaching context, identifying, critically analysing and integrating new knowledge regarding curriculum, pedagogy and assessment into his or her practice.

**Syllabus:** This module provides an opportunity to understand instructional, curricular, and assessment concepts related to lifetime physical activities (LPAs) as they relate to physical education. It has been designed to further develop the knowledge, content and applications in conjunction with other applied/practical modules. Particular emphasis will be placed on exploring the role that health-related activity (HRA) and regular exercise plays in the maintenance of health and wellness over the lifespan. It is intended for pre-service teachers to understand the need, and assume the responsibility for, maintaining a healthy lifestyle. Through both on and off campus laboratory learning experiences, students explore and participate in lifestyle physical activities. Additionally, using this content, pre-service teachers will continue to use the concepts of appropriate and effective pedagogy as it applies to LPAs in the physical education setting. The preparation of schemes of work and lesson plans for year 2 school placement will be a consistent focus of the module.

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**SS4103 - PSYCHOLOGY OF MOVEMENT DEVELOPMENT FROM INFANCY TO ADOLESCENCE**  
ECTS Credits: 6 (Year 2 Module)

**Physical Education & Sport Sciences**

**Rationale and Purpose of the Module:** To advance

*the students' knowledge and understanding of psychological development from infancy to adolescence from both motor development and psychosocial perspectives*

**Syllabus: MOTOR SKILL DEVELOPMENT**

Motor development as a part of human development; motor development as (a) a process and (b) as a field of study. Descriptions of the phases of motor development from infancy through adolescence to adulthood (reflexive, rudimentary, fundamental skills, sport specific skills) noting the changing characteristics. Factors influencing motor development (growth, maturation, genetics (nature), environment (nurture); historical overview of theories to explain motor development with focus on the maturation perspective of 1930s and more recent dynamic systems theory; influences of the individual, the environment and task demands Methods of investigation. Concepts of direction of development, readiness, critical/sensitive periods. Motor development in infancy, childhood and adolescence; early and late developers, implications for teaching and coaching. Importance of a developmental philosophy. Perception and perceptual development with focus on vision. Balance and its development. Evaluation of stimulation and perceptual motor training programmes at various phase of development.

**PSYCHO-SOCIAL DEVELOPMENT**

This module aims to develop a fundamental knowledge and understanding of how developmental issues from childhood to adolescence can influence participation and performance in sport and physical activity. This module will include content relating to youth sport participation and development including models of development in sport, the influence of significant others, stages of development, motivation and participation in sport, and burnout and dropout in sport. This module will compare and contrast readiness for youth sport competition from the biological, social, cognitive and psychological perspectives. The module content will consider psychological considerations of participation in sport and physical education from childhood to adolescence and will critically examine current practices in this area. This module will also critically consider best practices in this area based on research from youth sport and motor development, specifically addressing issues such as long term participation patterns, competition, and program characteristics.

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**SS4204 - SUPPORT SYSTEMS TO MUSCLE CONTRACTION**

ECTS Credits: 6 (Year 2 Module)

**Physical Education & Sport Sciences**

**Rationale and Purpose of the Module:** *The energy requirements of exercising muscle are carefully regulated and supported by fuel and oxygen delivery and the removal of waste products including heat. The purpose of this course is to provide an understanding of the regulation and adaptation of cardiovascular and pulmonary function in response to exercise. An experimental laboratory component provides an opportunity to challenge theoretical concepts by empirical analysis and to competence in measurement techniques.*

**Syllabus:** The challenge to cardiovascular and pulmonary function induced by physical activity. Cardiac and vasomotor regulation at rest and during exercise. Adaptation of the cardiovascular system to acute and chronic exercise.

Pulmonary and ventilatory control at rest and during exercise.

Adaptation of the cardiopulmonary system to chronic exercise (training).

Respiratory buffering. Altitude-induced hypoxia and cardiopulmonary function. Altitude training as an ergogenic aid.

Validity and sensitivity of cardiopulmonary measures of exercise performance.

**Prerequisites:** SS4202

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**SS4404 - COACHING AND SCIENCE PERFORMANCE 3**

ECTS Credits: 6 (Year 2 Module)

**Physical Education & Sport Sciences**

**Rationale and Purpose of the Module:** *To give students a theoretical and practical learning experience in the areas of sport administration and organisation and sport coaching.*

**Syllabus:** Administration and organisation: Structure and function of Irish NGB's. National coaching

development programmes. The module includes an introduction to the management issues related to sports administration and allows students gain practical experiences in the organization of a sports event. Students explore how to operate within an organization, e.g. minutes, meetings and time management, planning, budgeting, promoting, sponsorship, safety and legal aspects, running the event, media, legal and ethical aspects and evaluation.

**Coaching:** Planning, delivery and evaluation of phases of a single session, and of a number of sessions. Coaching, experience gained by placement of students with mentor coaches or exercise leaders in an ongoing practical setting. Maintenance of a coaching and reflective log.

**Exercise Prescription:** Specific case studies of asymptomatic participants for health related activity and sports specific training. Health appraisal, knowledge of participants goals, selection of appropriate field tests, assessment and evaluation of field tests, programme design for six weeks, delivery of programme, ongoing monitoring of participant and programme, post programme evaluation, guidelines for future work.

**Prerequisites:** SS4403

## Department of Physical Education & Sport Sciences Year 3 Modules

### PY4096 - PEDAGOGY OF STRIKING, FIELDING, NET GAMES

ECTS Credits: 6 (Year 3 Module)

#### Physical Education & Sport Sciences

**Rationale and Purpose of the Module:** *The aim of this course is to help students develop a practical knowledge, inclusive of theoretical aspects of striking, fielding and net games through a pedagogical context. It will introduce the students to the basics of each strand through participation in and later on through the application of pedagogical principles. The will identify and discuss cultural the cultural diversity of each A variety of teaching methods and equipment will be used. Students will learn how to plan lessons in order for them to be*

*safe, challenging and appropriate for all abilities.*

#### Syllabus: Theory:

Overview of striking,fielding and net games from a variety of perspectives (bio-mechanical, physiological, educational, pedagogical)

Striking, Fielding and Net Games in schools - limitations and possibilities

Striking, Fielding and Net Games lessons - planning for mixed ability

Cultural aspects of Striking, Fielding and Net Games

Applying Striking, Fielding and Net Games to Junior and Senior Cycle Syllabus

#### Practical:

Fundamentals skills of Striking, Fielding and Net Games

Involvement in and creation of 'Striking, Fielding and Net Games related activities' (indoors & out)

Teaching second level students the fundamentals of Striking, Fielding and Net Games

## Department of Physical Education & Sport Sciences Year 4 Modules

### PY4108 - YOUTH SPORT AND ADVOCACY

ECTS Credits: 6 (Year 4 Module)

#### Physical Education & Sport Sciences

**Rationale and Purpose of the Module:** *This module is designed to help pre service teachers understand different forms and meanings, characteristics and trends associated with the development of sport, physical activity and physical education provision predominantly for young people. The core concerns of the module will focus on how sport, physical activity and physical*

*education in schools and communities might be transformed in ways that enhance (young) people's engagement. The module content will encourage pre service teachers to critically reflect upon the ways in which particular forces shape sport, physical activity and physical education provision for young people in Ireland through key philosophical and sociological frameworks and from the perspective of policy development.. The module will provide opportunities for pre service teachers to examine the ways in which their commitment to, and informed engagement with, local sports and physical activity providers might have the potential to bring about 'positive' change for all stakeholders, while interrogating the extension of what it may mean to be a 'physical educator'. Through (i) assisting pre service teachers in developing their philosophical and sociological skills, (ii) facilitating them in answering key questions related to sport, physical activity and physical education and, (iii) encouraging them to articulate and defend a personal philosophy of physical education, the module aims to prepare pre-service physical education teachers to become physical education and physical activity advocates and change agents within and beyond traditional perspectives of physical activity and physical education programmes for young people.*

#### Syllabus:

The module content will be delivered in the lectures. Topics will include:

- &bull; The existing pillars of youth sport (physical education, extra-curricular sport and sport outside school), the relationship between them and implications for physical education teachers

- &bull; key philosophical and sociological perspectives, for example: the nature and value of physical education and physical activity; ethics, physical education and sport; movement, meaning and subcultures; philosophy and the body.

- &bull; Effective teaching, coaching and facilitation strategies (and the relationships between them) that accommodate diverse populations across sport, physical activity and physical education.

- &bull; Characteristics and trends in the development of (youth) sport policy

Pre service teachers will participate in service learning partnerships that provide opportunities for action research. These partnerships will be facilitated by the Local Sport Partnerships and require pre service teachers to engage in reviewing, evaluating and modifying aspects of their service activity based on reflection and feedback from key stakeholders. Pre service teachers will be asked

to consider how physical activity providers, coaches and/or physical education teachers can impact and be impacted by these (youth) sport contexts.

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#### **PY4118 - PHYSICAL ACTIVITY BEHAVIOUR, PROMOTION AND HEALTH** ECTS Credits: 3 (Year 4 Module)

##### **Physical Education & Sport Sciences**

**Rationale and Purpose of the Module:** *To create awareness and to motivate individuals to become involved in physical activity is a complex process and is interdisciplinary in nature. Students will have the opportunity to critically examine current concepts, issues and outcomes related to participation in physical activity. The physical education profession plays a key role in the promotion of physical activity within schools and society. A key focus of the module is that students will be able to evaluate and incorporate into their professional practice the relationship between physical activity participation and promotion, physical education provision and individual and national health status.*

**Syllabus:** Definitions relating to physical activity, health and health promotion. Overview of benefits of participation. Recommended amounts of physical activity, latest guidelines, rationale. Assessment and levels of Physical Activity. Determinants of participation in physical activity/sedentary. Multidisciplinary model of determinants. Inactivity related disorders; obesity/overweight, coronary heart disease, chronic obstructive pulmonary diseases, physical fitness, neuromuscular disorders, osteoporosis, diabetes. Lifestyle and risk factors for disease and premature mortality/morbidity. Exercise Prescription. Physical Activity Strategy. Examination of the role of the physical education teacher and curriculum in activity and health promotion. Whole school approach to health and physical activity promotion. Examples of good practice. Models of health related physical activity teaching. Structure and content of health related physical activity programmes for schools and community.

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#### **SS4198 - EXERCISE PSYCHOLOGY** ECTS Credits: 6 (Year 4 Module)

##### **Physical Education & Sport Sciences**

**Rationale and Purpose of the Module:** *The aim of this module is to provide students with a critical understanding of theories, concepts and practice in exercise psychology.*

**Syllabus:** This module will study the brain, cognition, emotion and behaviour in physical activity in both physical activity and exercise setting. The core topics of study will include the key concepts and theories, exercise and mental health, and the psychology of physical activity behaviour. It will also include hot topics under contemporary issues which will comprise half of the module.

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#### **SS4318 - NOVEL METHODS IN BIOMECHANICS** ECTS Credits: 6 (Year 4 Module)

##### **Physical Education & Sport Sciences**

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

- \* *To give students an understanding of new and developing methodologies in the biomechanics of sport and exercise.*
- \* *To give students an understanding of the applications of existing methods using novel and developing techniques of data analysis.*
- \* *To provide students an understanding of the merits of mathematics for biomechanics research.*

**Syllabus:** Syllabus

- \* Methods to examine variability in human movement: single subject analysis, considerations of movement variability.
  - \* Methods to examine coordination and stability in human movement: Applied Dynamics systems theory for analysis of movement, measures of coordination and variability in gait patterns.
  - \* New and developing methods for Data analysis of human movement: applications Power spectrum analysis, Wavelet analysis in biomechanics of Kinematic, Kinetic and EMG Data.
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#### **SS4418 - CLINICAL APPLICATIONS OF EXERCISE** ECTS Credits: 6 (Year 4 Module)

##### **Physical Education & Sport Sciences**

**Rationale and Purpose of the Module:** *This module is designed to provide students with an appreciation of the techniques and approaches used in designing and applying exercise interventions in specific clinical conditions. the aim is to allow students to apply aspects of physiology and applied exercise science to understanding the treatment / prevention of disease.*

**Syllabus:** The course begins with a structures review of the evidence for benefits of exercise and health. Practical aspects of exercise prescription, including pre-participant screening, components of exercise prescription, outcome measures and progression.

The course covers the application of exercise in the following conditions:

people with:  
neuromuscular disorders, with a focus on multiple sclerosis.  
cardiorespiratory disorders, including COPD and myocardial infarction.  
vascular disease, with a focus on peripheral arterial disease.  
osteoporosis.  
learning disorders, focusing on autistic spectrum disorder.  
pregnancy.

*Prerequisites: SS4202, SS4203*

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## **Department of Psychology Psychology Year 1 Modules**

#### **PS4012 - HUMAN DEVELOPMENT AND THE LIFE SPAN 1** ECTS Credits: 6 (Year 1 Module)

##### **Psychology**

**Rationale and Purpose of the Module:** *For students to extend and deepen their knowledge of human*

*development through the lifespan within the field of psychology. To develop skills in identifying and critically examining major tenets of psychological theory in relation to development through childhood, adolescence and adulthood.*

**Syllabus:** This module provides students with foundation information about how psychologists have studied human development from prenatal life through childhood, adolescence and the stages of adult life including older adulthood. The course will require students to reflect critically on recent empirical studies examining human development through these life stages. The course will focus on the topics of cognitive, biological, social and moral development, from the field of psychology. These topics are studied from a lifespan perspective.

*Prerequisites: PS4032, PS4031*

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#### **PS4032 - PSYCHOLOGY AND SOCIAL ISSUES**

*ECTS Credits: 6 (Year 1 Module)*

#### **Psychology**

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

*This module will explore a range of contemporary social issues bringing to bear upon them the methods and theoretical perspectives of psychology in an attempt to better understand their causes and consequences. Using the social issue as a focus, students will gain insight into the discipline of psychology and engage in debating and evaluating the theory and method of psychology. Through a psychological analysis of the causes and consequences of social issues students will gain insight into how these issues might be resolved. .*

**Syllabus:** Issues covered will include; the media and human behaviour; social conflict; the use and abuse of power; sex and sexuality; society and mental health; social inclusion and exclusion; bullying at work; equality and advocacy; parenting and childcare; the environment

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#### **PS4042 - PSYCHOLOGY: THEORY AND METHOD 2**

*ECTS Credits: 6 (Year 1 Module)*

#### **Psychology**

**Rationale and Purpose of the Module:** *To cover the main paradigms, concepts, issues, and debates in the core areas of cognitive psychology and developmental psychology.*

*To develop students' research and data analysis skills, specifically through the use of experimental methods and inferential statistics.*

**Syllabus:** This module is the second of two which provide coverage of the main paradigms, concepts, issues, and debates within the core areas of psychology. The section detailing developmental psychology will cover the main theoretical approaches to the study of human development from prenatal and childhood biological development to theories of socio-emotional development across the lifespan. The section on cognitive psychology will cover the basic cognitive models of memory and thinking. The key debate of the utility and limitations of the metaphor of 'the brain as information processor' will be common to both areas. In the laboratory classes, students will be required to employ basic principles of experimental design; data entry and analysis using SPSS; probability testing and inferential statistics.

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#### **PS4052 - PRACTICAL PSYCHOLOGY 2**

*ECTS Credits: 6 (Year 1 Module)*

#### **Psychology**

**Rationale and Purpose of the Module:** *to develop students understanding of the range of laboratory based activities in psychology and to provide opportunities for students to undertake practical studies in psychology and in so doing develop studentÆs ability to collect, code and analyse empirical data.*

**Syllabus:** This practical class introduces the range of methods employed in psychology to students. The value of experiments, observational, survey and interviews and case studies work are considered using illustrative examples. Practical skills in the experimental and survey methods are developed though the use of selected examples. Students are encouraged to become increasingly familiar with SPSS for coding of data and simple inferential statistics are introduced.

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#### **PS4062 - INTRODUCTION TO PSYCHOLOGY APPLIED TO NURSING AND MIDWIFERY**

*ECTS Credits: 6 (Year 1 Module)*

#### **Psychology**

**Rationale and Purpose of the Module:** *The aim of this module is to provide students with an understanding of psychological concepts and explore how these concepts relate to health within nursing and midwifery practice.*

**Syllabus:** An introduction to psychological theory, which includes developmental psychology throughout the life span, behavioural psychology, principles of sensation, perception, cognition, consciousness, emotion, motivation and personality, health psychology, stress management, coping and foundations of biological psychology, psychological impact of illness and hospitalisation and an introduction to the main categories of abnormal behaviour.

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## **Psychology Year 2 Modules**

#### **PS4033 - RESEARCH METHODS**

*ECTS Credits: 6 (Year 2 Module)*

#### **Psychology**

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

*5.2 For students to develop knowledge of the academic discipline of psychology through indepth interrogation of the concepts and principles of the variety of paradigms and epistemologies across psychological research.*

*5.3 Students will develop their laboratory report writing skills*

*5.4 By the end of the module students should be able to describe and explain the following aspects of research in psychology:*

*5.4.1 The epistemological principles underlying the diversity of collection methods*

*5.4.2 Advanced bivariate inferential statistics*

*5.4.3 Key aspects of psychological ethics including informed consent, deception, anonymity and*

confidentiality.

#### 5.4.4 Psychometric properties of standardised tests

**Syllabus:** Consolidation and development of students previous research training in psychological research methods. A review of research methods in psychology; introduction to advanced statistics, research concepts and terminology. A review of the scientific method as used in psychology research. Learning how to access research findings in the literature. Advanced ethics and ethical practice in research. Qualitative and quantitative paradigms and methods. Advanced issues in questionnaire design. Psychometric properties of tests. Advanced issues in sampling of selected populations. Drafting and presenting the psychological report.

Prerequisites: PS4042, PS4021

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### PS4034 - EMPIRICAL PSYCHOLOGY 2

ECTS Credits: 6 (Year 2 Module)

#### Psychology

**Rationale and Purpose of the Module:** To develop students ability to design, collect, code and analyse empirical data using non-experimental approaches in psychology

**Syllabus:** Classical approaches to psychology emphasise the importance of the experimental paradigm to understanding behaviour and mental processes. This lab based module introduces students to the shortcoming associated with the traditional experimental approach and familiarises them alternative correlation and observational paradigms via a series of practicals. Students learn to design, conduct, code and analyse quantitative psychometric data whilst paying due consideration to the welfare of participants and attending to the appropriate ethical guidelines.

Prerequisites: PS4042, PS4041

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## Psychology Year 4 Modules

### PS4037 - COGNITION 1

ECTS Credits: 6 (Year 4 Module)

#### Psychology

**Rationale and Purpose of the Module:** To provide core area coverage of the field of cognitive psychology - a sub-discipline of psychology concerned with the study of the mental processes that underlie human behaviour.

**Syllabus:** Cognitive processes cover a broad range of research domains including; memory, attention, perception, knowledge representation, reasoning and problem solving. In this module, through an empirical (including practical demonstrations) and theoretical examination of cognitive processes, students will develop their knowledge of central aspects of cognition including perception, memory and attention.

Prerequisites: PS4042, PS4021

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### PS4047 - SOCIAL PSYCHOLOGY 2

ECTS Credits: 6 (Year 4 Module)

#### Psychology

**Rationale and Purpose of the Module:** To build upon previous introductory modules in social psychology by providing comprehensive indepth coverage of the core areas of the subdiscipline as well as alternative critical perspectives

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

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

discursive social psychology; measurement in social psychology; critical perspectives in social psychology.

Prerequisites: PS4011

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### PS4087 - POLITICAL PSYCHOLOGY

ECTS Credits: 6 (Year 4 Module)

#### Psychology

**Rationale and Purpose of the Module:** To extend students knowledge of psychology into the area of political psychology and to improve students understanding of the role that social and political structures can have on human behaviour

**Syllabus:** The specific focus of this module is political psychology. Political psychology is an interdisciplinary area of psychology. The course provides an introduction to the psychological foundations of political life. Psychological theories are applied to particular political problems including the formation of belief systems, moral reasoning and ideology, colonialism, political socialization, political culture, mass hysteria, psychohistory. In doing so, it is demonstrated how psychology informs political behaviours and actions, the behaviour of politicians and the effects of social and political structures on behaviour.

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### PS4097 - DEVELOPMENTAL PSYCHOPATHOLOGY

ECTS Credits: 6 (Year 4 Module)

#### Psychology

**Rationale and Purpose of the Module:** to introduce students to the rapidly developing field of developmental psychopathology to improve students understanding of the role that social, psychological and biological factors play in determining mental health and to highlight the importance of the developmental approach to understanding adjustment and maladjustment.

**Syllabus:** The specific focus of this module is developmental psychopathology. Developmental psychopathology is a domain of psychology which concentrates on how psychosocial and biological factors contribute to psychological adjustment and maladjustment. The module will introduce students evidence relating both environmental and genetic determinants of mental health and consider the role that developmental factors may have in the expression of mental health problems.

**Prerequisites:** PS4012

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#### **PS4108 - APPROACHES TO SOCIAL IDENTITY**

*ECTS Credits: 6 (Year 4 Module)*

#### **Psychology**

**Rationale and Purpose of the Module:** *For students to develop an understanding of the different theoretical approaches to the study of social identities in psychology as compared to those in other disciplines To introduce students to the range of epistemologies and methodologies employed in social psychological research and to outline the implications of these for the discipline of psychology more generally.*

**Syllabus:** The Social Identity approach in social psychology originated in an interdisciplinary effort to explain large-scale intergroup conflict. Drawing upon sociology, social anthropology and social cognition it aimed to provide a comprehensive account of intergroup relations from the individual perspective to the group level. However, in the four decades since its inception the Social Identity approach has become overwhelmingly cognitive and experimental in focus and lost links with other disciplines and methodologies. This module places the Social Identity perspective in its historical context and introduces students to cognate theories and methods elsewhere in social psychology and in other disciplines with a view to enriching their understanding of social psychology. Topics include: evolution of the Social Identity approach; advances in Self Categorisation Theory; discursive approaches to social identities; ethnography and displays of identity; approaches to national identity.

**Prerequisites:** PS4011

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## **Department of Nursing & Midwifery**

### **Nursing & Midwifery Year 1 Modules**

#### **NM4092 - INTRODUCTION TO HEALTH AND HEALTH PROMOTION**

*ECTS Credits: 6 (Year 1 Module)*

#### **Nursing & Midwifery**

**Rationale and Purpose of the Module:** *To introduce the concepts of health, health education and health promotion to nursing and midwifery students and provide the necessary foundations to develop competence in the promotion of health.*

**Syllabus:** Concepts of health and wellbeing, illness, disease and disability. Determinants of and influences upon health. Health inequalities, protection and welfare of vulnerable groups. Measuring health and identifying health care needs. Health strategies and policies. Empowerment, advocacy, partnership working, health literacy, ethical issues. Health education, health promotion, public health, screening and preventative medicine. Health promotion models and approaches. Health needs of diverse groups and different cultures. The role of the nurse/midwife in promoting health and supporting healthier life choices across the health spectrum. Settings approach to health promotion e.g. communities, work place, schools, hospitals.

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#### **NM4152 - BIOLOGICAL SCIENCES APPLIED TO NURSING & MIDWIFERY 2**

*ECTS Credits: 6 (Year 1 Module)*

#### **Nursing & Midwifery**

**Rationale and Purpose of the Module:** *The aim of this module is to provide students with a foundation for understanding human systems and provide an introduction into pathology as applied to nursing and midwifery practice.*

**Syllabus:** The structure, function and biochemistry of the endocrine system and the special senses. Structure and function of the central nervous system, pain pathways and the biochemical and signalling process regulating action potentials and nerve impulses: The peripheral nervous system. The autonomic nervous system. Introduction to pathology: Inflammation, granulomas, repair/regeneration of tissues, tumours, degenerative changes in cells/tissues, carcinogenesis, classification of tumours, tumour biology. Introduction to X-rays, radioactivity and diagnostic radiology.

#### **NM4181 - PERSON CENTRED MEDICAL NURSING**

*ECTS Credits: 6 (Year 1 Module)*

#### **Nursing & Midwifery**

**Rationale and Purpose of the Module:** *This module builds on the philosophies and fundamentals of person centred nursing and introduces students to the principles of acute medical nursing.*

**Syllabus:** Person centred medical nursing; assessment and monitoring techniques, planning interventions and interrelationships between activities of living utilising exemplars from conditions including assessment of breathlessness, asthma, pneumonia, hypertension, myocardial infarction, acute pain, altered consciousness. The impact of illness on the individual's physical, spiritual, social, cultural and psychological wellbeing; promoting health and recovery.

Clinical skills

Airway management

Nursing assessments and monitoring techniques

Oxygen therapy

Suctioning techniques

Devices: nebulisers and inhalers

Active and assisted limb exercises

Introduction to neurological assessment

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#### **NM4231 - MIDWIFERY CARE IN PREGNANCY**

*ECTS Credits: 6 (Year 1 Module)*

#### **Nursing & Midwifery**

**Rationale and Purpose of the Module:** *The aim of the module is to facilitate students to acquire a thorough understanding of the anatomy and physiology of pregnancy, maternal adaptations and the care needed for women during pregnancy.*

**Syllabus:** Anatomy and physiology of pregnancy. Fertilisation and early development; placental development, fetal and maternal adaptations. The female pelvis and the reproductive organs. Preconception care. Initial antenatal assessment and on-going antenatal assessment and care. Antenatal screening and investigations of the woman and fetus. Common problems associated with early and advanced pregnancy. Transition to parenthood in the antenatal period. This module will incorporate the equivalent of one week clinical placement.

#### Clinical skills:

Landmarks and diameters of female pelvis and fetal skull and their application to midwifery practice  
Initial antenatal visit  
Abdominal examination  
Antenatal assessment, monitoring and investigations throughout pregnancy  
Fetal assessment, fetal auscultation and use of pinnard; application of cardiotocograph.

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### NM4252 - INTRODUCTION TO SUPPORT STRATEGIES ACROSS THE LIFESPAN

ECTS Credits: 6 (Year 1 Module)

#### Nursing & Midwifery

**Rationale and Purpose of the Module:** *The module explores the role of the nurse in supporting the person, transitioning through the lifespan.*  
*Person centred care provision utilising the nursing process as applicable across the lifespan. In meeting the needs of individuals in a safe, legal, and ethical manner using the nursing process. Students will be introduced to policies, practices and procedures that directly influence the lives of people with intellectual disabilities.*

**Syllabus:** Definition and characteristics of a lifespan approach, theories of lifespan development e.g.; Bronfenbrenner's. Person centred and health focused approaches to care. Nursing models and theories. Application of the nursing process towards understanding

the needs/outcomes of individual/families person centred plans, health action plans, communication passports etc. Nursing care skills - assessment, observation, decision making, risk management and interventions in supporting individuals. International, national and local strategies to support the rights of people with ID. Development of age appropriate interpersonal, cross cultural and communication techniques and skills essential for communicating with persons with an intellectual disability, families, and colleagues. Person centred nursing skills  
Care planning underpinned by principles of person centred care  
Personalised, enabling and co-ordinated planning approaches  
Needs and Outcomes assessment, planning implementation and evaluation  
Introduction to nutritional assessment and support  
Case management skills; organisation, administration and relationship skills

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## Nursing & Midwifery Year 2 Modules

### CP4115 - PRACTICE PLACEMENT 4

ECTS Credits: 3 (Year 2 Module)

#### Nursing & Midwifery

**Rationale and Purpose of the Module:** *This is the fourth of eight practice placement modules.*  
*This module is offered at learning level 2, towards development of competence (NMBI 2016) recognising that the student has had some exposure and participation in the provision of care in practice. The student needs both the assistance and close supervision of the registered nurse while participating in person centred nursing.*

**Syllabus:** This module has four weeks of Practice Placement.

The student continues to identify his/her learning needs, through reflection and engagement in the learning environment.

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### CP4193 - PRACTICE PLACEMENT 3

ECTS Credits: 3 (Year 2 Module)

#### Nursing & Midwifery

**Rationale and Purpose of the Module:** *This is the third of eight practice placement modules.*  
*This module is offered at learning level 2, towards development of competence (NMBI 2016) recognising that the student has had some exposure and participation in the provision of care in practice. The student needs both the assistance and close supervision of the registered nurse while participating in person centred nursing.*

**Syllabus:** This module has four weeks of Practice Placement.

The student continues to identify his/her learning needs, through reflection and engagement in the learning environment.

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### NM4094 - OLDER PERSON NURSING: VALUE BASED PRACTICE

ECTS Credits: 6 (Year 2 Module)

#### Nursing & Midwifery

**Rationale and Purpose of the Module:** *The aim of this module is to foster and connect students' understanding of healthy ageing and promote person centred nursing with older persons and their families across the care continuum.*

**Syllabus:** Valuing individuality, dignity, choice and diversity in later life, protecting and upholding rights of older people, autonomy and advocacy. Meaningful engagement with individuals, families and/or carers connecting intergenerational communities and society. Application of theories of ageing; role transitions and loss. Personal and relationship centred care. Promoting recovery, rehabilitation, wellbeing and choice. Mental and physical factors e.g. cognitive impairment, dementia, pain, falls prevention, vision and hearing loss. Elder abuse and neglect principles and interventions. Therapeutic modalities, dementia screening, polypharmacy, medication concordance. Interdisciplinary collaboration across the care continuum in environments that promote and support independence across community care settings; carer support. Communication and therapeutic strategies to support older person centred care.

**NM4134 - INTELLECTUAL DISABILITY ADULT NURSING**  
**ECTS Credits: 6 (Year 2 Module)**

**Nursing & Midwifery**

**Rationale and Purpose of the Module:** *Building on previous knowledge this module addresses nursing aspects related to young and middle adulthood and specific support and intervention strategies required assisting in health and wellbeing of adults with an ID.*

**Syllabus:** Theories of adulthood. Transition from adolescences, rights of the adult with an intellectual disability. Services to support community integration, empowerment, advocacy, autonomy and choice. Communication to support decision making in choosing a home, employment and parenting services, interpersonal relationships, marriage and parenthood. Therapeutic relationships and psychosocial supports for health and lifestyle decisions and health promotion activities in adulthood. Holistic case management; values based support; personal, health work and leisure. Safeguarding; recognising and responding to abuse.

dementia macular degeneration. Living arrangements and service provision for the older person with an intellectual disability. The following concepts related to the older person with an intellectual disability; retirement, recreational and leisure pursuits, spiritual care, pastoral care and palliative care. Applied pharmacology.

Person centred nursing skills  
 Care planning underpinned by principles of person centred care  
 Health and wellbeing (engagement in activities of living, maintaining social connectedness)  
 Nutritional assessment and support of the older adult  
 Dementia assessment, care skills, care support planning  
 Health Promotion (communication skills: talking mats, reality orientation, reminiscence, fragility and falls assessment)  
 Bereavement support.

**NM4154 - PROMOTING RECOVERY IN PERSONS EXPERIENCING PSYCHOSIS**

**ECTS Credits: 6 (Year 2 Module)**

**Nursing & Midwifery**

**Rationale and Purpose of the Module:** *The purpose of this module is to develop students' knowledge and understanding of the role of the psychiatric/ mental health nurse in supporting an individual experiencing psychotic disorder and their family/carer on the shared journey of recovery. The module will build on the knowledge gained in previous modules.*

**Syllabus:** Person-centred and recovery-focused practice. Assessment and management of persons with psychotic disorders. Strengths based approaches. Early intervention for psychosis. The role of the nurse in providing psychosocial (e.g. CBT, family interventions, relapse prevention, social skills) and pharmacological interventions which facilitate recovery and well-being in persons with psychosis and their families\carers. Collaboration with other health care professionals, service users, families and communities to provide culturally appropriate care for persons with psychotic disorders. Contemporary research findings and relevant health policy.  
 Clinical Skills  
 Engaging persons who experience psychosis  
 Biopsychosocial pharmacological recovery/strengths

assessment and care planning  
 Relapse prevention  
 CBT for psychosis  
 Family interventions  
 Recovery focused interventions  
 Group interventions (e.g. social skills training, family work)

**NM4164 - MENTAL HEALTH AND WELLBEING IN OLDER PERSONS**

**ECTS Credits: 6 (Year 2 Module)**

**Nursing & Midwifery**

**Rationale and Purpose of the Module:** *The purpose of this module is to develop students' knowledge and understanding of common mental health difficulties associated with the older person. The module aims to consider and discuss the most up to date evidence based assessment and treatment modalities in tandem with current health care policies so as to ensure quality, holistic, and safe nursing care for the older person experiencing mental health problems, and their families/carers across primary, secondary and tertiary health care settings.*

**Syllabus:** Mental health and healthy aging, diversity, spirituality, sexuality. Mental health difficulties that affect the older person; functional and cognitive disorders. The role of the mental health nurse caring for older people with mental health difficulties living in a variety of settings. The statutory and voluntary services in the care of the older person. Person-centered care. Recovery approaches to older person assessment, planning, interventions and evaluation. Falls prevention. Supporting older persons for optimal emotional, psychological and physical wellbeing. Palliative and end of life care. The concept of recovery and older people's narratives. Elder abuse. Support mechanisms for family and carers. Pharmacological and non-pharmacological interventions. National and international policies and strategies.  
 Clinical Skills:  
 Assessment (e.g. risk, nutritional, Mini-Mental State Examination) and care planning  
 Meaningful person-centered activity planning for the older person  
 Therapies for the older person: e.g. reminiscence therapy, validation and reality orientation, working with

**NM4144 - INTELLECTUAL DISABILITY OLDER ADULT NURSING**

**ECTS Credits: 6 (Year 2 Module)**

**Nursing & Midwifery**

**Rationale and Purpose of the Module:** *Building on previous knowledge this module addresses nursing aspects related to nursing the older adult with intellectual disability and specific support and intervention strategies required assisting in health and wellbeing of the older adult.*

**Syllabus:** Ageism, concepts and theories of ageing, physiological social and psychological changes associated with generic ageing and the older person with an intellectual disability. Nursing care and management of support for the older person with an intellectual disability. Person centred planning and the concept of choice and quality of life in older adulthood. Nursing process applied to the older person with an intellectual disability associated with age related illness and

Life history  
End of Life care/ last offices

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### **NM4233 - FOUNDATIONS OF MATERNAL, CHILD, AND MENTAL HEALTH NURSING**

ECTS Credits: 6 (Year 2 Module)

#### **Nursing & Midwifery**

**Rationale and Purpose of the Module:** *This module provides undergraduate general students with the opportunity to develop foundational knowledge in relation to three discrete areas of nursing: maternity, children and mental health nursing.*

**Syllabus:** Foundations of family centred care. Assessment and management of children and young people experiencing acute and long term conditions in collaboration with their parents. Effects of hospitalisation. Foundations of maternity and neonatal care. Protecting women and children, roles and scope of practice. Fostering mental health and well-being as a continuum. An introduction to person centred mental health nursing, supporting individuals and families in distress affected by mental ill health. Access and referral care pathways and service. Introduction to promoting recovery. Introduction to strategies for individuals affected by mental ill health. Skills  
Maternal and paediatric early warning scores  
Examination of the baby  
Feeding and bathing babies/children  
Communicating with children  
Relaxation and self-care techniques  
Introduction to crisis intervention strategies

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### **NM4243 - NURSING INDIVIDUALS LIVING WITH LONG TERM CONDITIONS**

ECTS Credits: 6 (Year 2 Module)

#### **Nursing & Midwifery**

**Rationale and Purpose of the Module:** *This module will address person-centred nursing care of individuals with long term health conditions across hospital and community settings.*

**Syllabus:** Promoting health and wellbeing for individuals, living with and managing chronic pain,

disability, co-morbidity and impairment in long term conditions across care settings. Assessment, care planning, therapeutic interventions supporting families and carers, psychosocial approaches; self-management and assisted technologies.

Spirituality, concepts of hope, choice, resilience, empowerment and coping across disease trajectories. Collaborative multi-disciplinary team practice and recognising the need for escalation care. The nursing contribution in maximising the quality of life for persons living with long term conditions.

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### **NM4253 - MIDWIFERY CARE FOR THE POSTNATAL MOTHER, BABY AND FAMILY**

ECTS Credits: 6 (Year 2 Module)

#### **Nursing & Midwifery**

**Rationale and Purpose of the Module:** *The aim of this module is to explore the provision of midwifery care in the postnatal period for the mother, baby and family.*

**Syllabus:** Physiology of the puerperium, monitoring postnatal progress including postnatal examination and assessment, care required post-operative birth, urinary bladder management. Transition to extrauterine life, thermoregulation. Initial steps of neonatal resuscitation. Monitoring progress of the neonate including examination. Meeting the safety needs of mother and baby. Registration of birth. Physiological jaundice. Newborn screening. Vaccinations and immunisations. Parenting and attachment. Promoting a healthy psychological adaptation to motherhood and fatherhood. Discharge planning for the woman and infant. Care of women and families experiencing a perinatal loss.

Clinical skills:  
Postnatal examination of the mother  
Examinations of the baby  
Neonatal vital signs including pulse oximetry  
Skin care and hygiene of the baby  
Newborn bloodspot screening technique  
Documentation and administration of medication to the mother and baby  
Perinatal mental health assessment tools  
Parenting skills  
Discharge planning for mother and baby  
Initial steps of resuscitation of newborn  
Bereavement and perinatal loss workshop.

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### **NM4264 - RESPONDING TO COMPLEX NEEDS DURING PREGNANCY**

ECTS Credits: 6 (Year 2 Module)

#### **Nursing & Midwifery**

**Rationale and Purpose of the Module:** *The aim of this module is to facilitate students in the assessment, care and management of women experiencing at risk and complicated pregnancy.*

**Syllabus:** Assessment, investigations and management of maternal and fetal well-being in women experiencing at risk and complicated pregnancy including maternal mortality and morbidity. Bleeding before the 24th week of pregnancy; other problems associated with early pregnancy including antenatal infection. Antepartum haemorrhage. Hepatic disorders. Abnormalities of the amniotic fluid. Medical conditions of significance: hypertensive disorders: endocrine disorders; cardiac disease; renal disease; respiratory disorders; haematological disorders, neurological disorders; incorporating medication management. Documentation including use of IMEOWS.

Clinical skills:  
Principles of management of bleeding including basic life support measures  
Management of severe pre-eclampsia, fulminating pre-eclampsia and eclampsia including medication management  
Management of epileptic seizures  
Management of an asthmatic attack  
Management of blood sugar monitoring, hypoglycaemia and hyperglycaemia.

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### **NM4274 - OBSTETRIC COMPLICATIONS IN PREGNANCY AND CHILDBIRTH**

ECTS Credits: 6 (Year 2 Module)

#### **Nursing & Midwifery**

**Rationale and Purpose of the Module:** *The aim of this module is to enable students to recognise midwifery and obstetric emergencies and initiate appropriate management and escalate care in collaboration with other health care professionals.*

**Syllabus:** The midwife's role in the identification, care and management of women experiencing complicated

birth. Malpositions and malpresentations. Preterm labour including PPROM. Prolonged pregnancy and disorders of uterine action. Amniotic fluid embolism. Operative and assisted birth. Intrapartum and Primary postpartum haemorrhage. Multiple pregnancy and birth. Medication management in obstetric complications and emergencies.

**Clinical skills:**

- Interpretation of fetal heart rate patterns and cardiotocograph
- Mechanisms of malpresentations/malpositions
- Management of shoulder dystocia
- Management of breech birth
- Management of presentation and prolapse of the umbilical cord;
- Assessment and management of postpartum haemorrhage including estimation of blood loss
- Manual removal of the placenta
- Management of birth of twins
- Application of principles of perioperative skills including cricoid pressure
- Communication using ISBAR and Irish Modified Early Warning Scoring System (IMEOWS).

## Nursing & Midwifery Year 3 Modules

### NM4036 - MEETING AND SUPPORTING THE PERSON WITH INTELLECTUAL DISABILITY AND COMPLEX NEEDS

ECTS Credits: 6 (Year 3 Module)

#### Nursing & Midwifery

**Rationale and Purpose of the Module:** Nurses are central in today's increasingly collaborative health care teams that place a premium on quality care and this module addresses the holistic management of multiple health conditions that persons with intellectual disability experience.

**Syllabus:** Acute and chronic physical illness; multiple and complex needs. Profiling disability related conditions, epilepsy, diabetes, nutrition, trends, health needs and provision of services. Approaches to assessments-and developing a comprehensive clinical impression, referral for specialist assessment; Nursing management of conditions related to trends, disability specific conditions;

in addition to respiratory, metabolic and gastrointestinal conditions. Assessing, investigative and diagnostic procedures, planning interventions, evaluating plans and interventions of multiple health conditions. Case management of multiple and complex needs, multi-trans-inter disciplinary approaches.

**Person Centred Nursing Skills**

- Person centred nursing approaches in comprehensive health assessment (physical health; head to toe and systems assessment approaches)
- Nutritional care (nutritional tools and assessment, PEG, enteral feeding)
- Continenence care (Skills and protocols of catheterisation, enema/suppository administration)
- Reporting clinical impression

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### NM4046 - SUPPORTING THE PERSON WITH INTELLECTUAL DISABILITY IN CHALLENGING BEHAVIOURAL OR MENTAL HEALTH SITUATIONS

ECTS Credits: 6 (Year 3 Module)

#### Nursing & Midwifery

**Rationale and Purpose of the Module:** The aim of the module is to critically evaluate the role of the RNID in supporting individuals in challenging behavioural or mental health situations in the context of current attitudes policies and practices

**Syllabus:** Human behaviour, adaptive and maladaptive responses. Positive Behaviour Support. Assessment of functional communication e.g. aggressive violent and self-injurious behaviours. Supporting individuals to communicate effectively e.g. Pics for Pecs. Behavioural therapies. Dual diagnosis, e.g. phobias, eating disorders, anxiety disorders, psychosexual disorders, percpetual and mood disorders, schizophrenia, depression. Attention deficit disorders with or without hyperactivity. Interventions e.g. cognitive therapies, risk management, use of restrictive practices, legal and ethical decision making, applied pharmacology. Multi-element plans in the context of person-centred planning and nursing process.

Legislation including capacity assessment and legislation pertaining to intellectual disability nursing practice across the life span continuum. Statutory regulations governing the rights and supports necessary to provide effective and compassionate care for a person with an intellectual disability, including the giving and refusing of consent to

intervention and of a person's developmental and legal capacity.

**Person centred nursing skills**

**Functional behavioural assessment**

**Mental health assessment incorporating use of mental health assessment tools**

**Practice assessment and management of the dynamics of risk.**

**Behavioural support strategies (positive behaviour support plans)**

**De-escalation techniques**

**Cognitive behavioural therapy**

**Relaxation techniques**

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## NM4076 - NURSING IN PRIMARY AND COMMUNITY SETTINGS

ECTS Credits: 6 (Year 3 Module)

#### Nursing & Midwifery

**Rationale and Purpose of the Module:** This module aims to introduce the student nurse to primary and community care exploring its centrality to the health and well-being of individuals and communities. The student nurse will develop knowledge and apply it to different practice and organisational settings facilitated through a four week practice placement.

**Syllabus:** Introduction to concepts and principles of primary health care practice and community nursing in a socio- political context from local, regional, national and international perspectives. Organisation of health care within community settings; statutory and voluntary agencies, Primary Care Team and social care networks, community intervention team. Role of the nurse (General, Mental Health and Intellectual Disability) across the community health care continuum, support services for person, family and carers. Bio-psycho-social assessment of individuals; coordination of care, interventions and evaluation of care within community multidisciplinary teams. Supported living in the community; opportunities and challenges in healthcare delivery in primary care and community nursing. Primary health care for marginalised and vulnerable groups. This module incorporates the equivalent of four weeks clinical placement.

## **NM4086 - RESEARCH AND EVIDENCE IN HEALTHCARE**

*ECTS Credits: 6 (Year 3 Module)*

### **Nursing & Midwifery**

**Rationale and Purpose of the Module:** *This module will develop students understanding of research and evidence informing healthcare practice.*

**Syllabus:** Research skills development; cognitive and practical. Research terminology; processes and approaches; research methodology and methods. Systematic searching, hierarchy of evidence. Data extraction techniques; reviewing evidence; ethical principles and research integrity. Working with evidence and evidence based practice and translating evidence and research into practice.

## **NM4096 - PERSON CENTRED APPROACHES TO REHABILITATION NURSING**

*ECTS Credits: 6 (Year 3 Module)*

### **Nursing & Midwifery**

**Rationale and Purpose of the Module:** *This module will explore person centred approaches in supporting individuals with rehabilitation care needs through primary, secondary and tertiary interfaces.*

**Syllabus:** Concepts of rehabilitation and recovery, individual values, preferences and choices. Assessment frameworks, therapeutic interventions and transitions of care across emergency and specialist departments and care teams using exemplars including COPD exacerbations and outreach care, Parkinson's disease, Multiple sclerosis. Stroke care, hip fracture and frailty syndrome, amputation, chronic renal disease, transplantation. Collaborative practice and coordination of care planning services across multidisciplinary teams; recovery and rehabilitation in partnership with families, carers, services and teams, connecting primary, secondary, and tertiary services, community, voluntary and support groups.

## **NM4106 - PRINCIPLES OF PALLIATIVE CARE**

*ECTS Credits: 6 (Year 3 Module)*

### **Nursing & Midwifery**

**Rationale and Purpose of the Module:** *This module is founded on the centrality of person centred approaches in supporting individuals and their families across a palliative care journey.*

**Syllabus:** Philosophy and frameworks for person and family centred palliative care. Psychosocial, spiritual and cultural dimensions in respecting individuality and choice along a personal journey. Communication and therapeutic relationships. Self-care for individuals families and practitioners. Collaborative decision making. Managing physical and psychosocial symptoms in promoting wellbeing, optimising comfort and quality of life. Death and dying a social and cultural perspective; individualised care planning in end of life care. Rituals, dignity and safety following death. Bereavement processes. Family/carer experiences of grief and loss.

## **NM4116 - TRANSITION TOWARDS A COMPETENT PRACTITIONER**

*ECTS Credits: 6 (Year 3 Module)*

### **Nursing & Midwifery**

**Rationale and Purpose of the Module:** *This module will provide students with a deeper understanding of contemporary professional roles and responsibilities related to clinical judgement and decision making. It will enable students to apply this knowledge in becoming a lifelong reflective learner and competent practitioner.*

**Syllabus:** Professional values and scope of practice; responsibility and expectations towards becoming a competent practitioner including continuing professional development. Reflective practice as a lifelong endeavour in fulfilling personal and professional accountability. Clinical judgement and decision making guiding practice; responding to, reporting and referring to incidents and practice events, developing resilience in sustaining therapeutic relationships in dynamic changing healthcare environments. Approaches to adult learning, principles of preceptorship including the promotion of a quality clinical learning environment, models of supervision. Becoming a lifelong learner, practitioner and scholar.

## **NM4136 - RESPONDING TO COMPLEX NEEDS DURING THE POSTNATAL PERIOD**

*ECTS Credits: 6 (Year 3 Module)*

### **Nursing & Midwifery**

**Rationale and Purpose of the Module:** *The aim of this module is to enable students to recognise and respond to complex needs of the woman during the postnatal period and to initiate appropriate management and escalate care in collaboration with other health care professionals.*

**Syllabus:** The midwife's role in the identification, care and management of women experiencing complex needs in the postnatal period. Physical health problems and complications in the postnatal period including secondary postpartum haemorrhage, postpartum thrombophlebitis, DVT and pulmonary embolism; postpartum pre-eclampsia/eclampsia; and postpartum thyroiditis. Thromboembolic disease. Puerperal infection including wound infection and sepsis. Psychosocial and cultural needs of women experiencing complicated childbirth, Recognition and care of the critically ill woman. Complex postnatal care and medication management Clinical skills:

Management and care of the critically ill woman including homeostasis and fluid management and replacement including blood transfusion and oxygen therapy  
Communication skills in the care of the critically ill woman

Management of severe sepsis and septic shock  
Pharmacology Workshop  
Wound care.

## **NM4146 - RESPONDING TO COMPLEX NEEDS OF THE AT RISK AND ILL NEONATE**

*ECTS Credits: 6 (Year 3 Module)*

### **Nursing & Midwifery**

**Rationale and Purpose of the Module:** *The aim of this module is to develop the student's knowledge and skills required to care for the at risk and ill neonate in collaboration with members of the multidisciplinary health care team.*

**Syllabus:** Systematic care for the at risk and ill neonate e.g. management of cardiovascular and respiratory disorders, neonatal jaundice, metabolic transient disorders, endocrine disorders chromosomal and congenital anomalies, infections in the neonate, trauma in the neonate; complications arising with low birth weight, preterm and post term infant; nutritional requirements for infants with special needs; neonatal resuscitation and rapid midwifery intervention; perinatal and infant morbidity and mortality. Parenting journey in the neonatal unit; adoption and fostering; child protection issues; ethical and legal issues; support for parents experiencing bereavement and loss with the at risk and ill neonate.

#### Clinical skills:

Neonatal Resuscitation Programme

Assessment and management of the at risk and ill neonate

Nutritional support for the at risk and ill neonate (feeding practices oral, nasogastric)

Care of baby in an incubator

Care of baby with jaundice

Breastfeeding under special circumstances and alternative methods of infant feeding

Administration of medication to the neonate.

## NM4155 - CONTEMPORARY MIDWIFE PRACTITIONER

ECTS Credits: 6 (Year 3 Module)

#### Nursing & Midwifery

**Rationale and Purpose of the Module:** *The aim of this module is to provide students with opportunities to integrate practice in the care of women experiencing normal birth in the context of choice and risk.*

**Syllabus:** Normal childbirth evidence and debate.

Physiological and normal birth and application to midwifery practice in all settings. Birthing options and services available for women at local, national and international level. Midwife's role in homebirth and in midwife led units. Decision making and risk assessment skills required for autonomous contemporary practice.

Risk and choice paradox such as vaginal birth after

caesarean section. Legal requirements of the midwife. Midwifery theories for practice. Complementary and alternative medicines applied to maternity care. Principles of adult education and application to parent education. Childbirth education for specific social and cultural groups. This module will incorporate the equivalent of four weeks clinical placement.

#### Clinical skills:

Facilitating birth in the community setting

Skills in facilitating physiological birth

Consolidating skills for vaginal examination

Indications and skills for episiotomy

Introduction to perineal suturing

Facilitation of childbirth education to specific groups.

## Department of Nursing & Midwifery Year 1 Modules

### NM4231 - MIDWIFERY CARE IN PREGNANCY

ECTS Credits: 6 (Year 1 Module)

#### Nursing & Midwifery

**Rationale and Purpose of the Module:** *The aim of the module is to facilitate students to acquire a thorough understanding of the anatomy and physiology of pregnancy, maternal adaptations and the care needed for women during pregnancy.*

**Syllabus:** Anatomy and physiology of pregnancy. Fertilisation and early development; placental development, fetal and maternal adaptations. The female pelvis and the reproductive organs. Preconception care. Initial antenatal assessment and on-going antenatal assessment and care. Antenatal screening and investigations of the woman and fetus. Common problems associated with early and advanced pregnancy. Transition to parenthood in the antenatal period. This module will incorporate the equivalent of one week clinical placement.

#### Clinical skills:

Landmarks and diameters of female pelvis and fetal skull and their application to midwifery practice

Initial antenatal visit

Abdominal examination

Antenatal assessment, monitoring and investigations throughout pregnancy

Fetal assessment, fetal auscultation and use of pinnard; application of cardiotocograph.

\*\*\*Please note there is space for 1 student.\*\*\*

### NM4152 - BIOLOGICAL SCIENCES APPLIED TO NURSING & MIDWIFERY 2

ECTS Credits: 6 (Year 1 Module)

#### Nursing & Midwifery

**Rationale and Purpose of the Module:** *The aim of this module is to provide students with a foundation for understanding human systems and provide an introduction into pathology as applied to nursing and midwifery practice.*

**Syllabus:** The structure, function and biochemistry of the endocrine system and the special senses. Structure and function of the central nervous system, pain pathways and the biochemical and signalling process regulating action potentials and nerve impulses: The peripheral nervous system The autonomic nervous system. Introduction to pathology: Inflammation, granulomas, repair/regeneration of tissues, tumours, degenerative changes in cells/tissues, carcinogenesis, classification of tumours, tumour biology. Introduction to X-rays, radioactivity and diagnostic radiology.

\*\*\*Please note there is space for 3 students.\*\*\*

### NM4181 - PERSON CENTRED MEDICAL NURSING

ECTS Credits: 6 (Year 1 Module)

#### Nursing & Midwifery

**Rationale and Purpose of the Module:** *This module builds on the philosophies and fundamentals of person centred nursing and introduces students to the principles of acute medical nursing.*

**Syllabus:** Person centred medical nursing; assessment and monitoring techniques, planning interventions and interrelationships between activities of living utilising exemplars from conditions including assessment of breathlessness, asthma, pneumonia, hypertension, myocardial infarction, acute pain, altered consciousness. The impact of illness on the individual's physical, spiritual, social, cultural and psychological wellbeing; promoting health and recovery.

Clinical skills

Airway management

Nursing assessments and monitoring techniques

Oxygen therapy  
Suctioning techniques  
Devices: nebulisers and inhalers  
Active and assisted limb exercises  
Introduction to neurological assessment

\*\*\*Please note there is space for 2 students.\*\*\*

#### **NM4192 - MIDWIFERY CARE IN CHILDBIRTH**

ECTS Credits: 6 (Year 1 Module)

#### **Nursing & Midwifery**

**Rationale and Purpose of the Module:** *The aim of this module is to explore the provision of midwifery care within the parameters of normal childbirth.*

**Syllabus:** Normal labour and birth and the role and responsibilities of the midwife in providing woman-centred care and promoting normal birth. Anatomy and physiology and how they inform care provision in the first, second, third stage of labour and in the early puerperium. Onset, process and progress of labour. Monitoring maternal and fetal wellbeing in labour supporting women and their partners in the birth of their babies. The physiology of pain; working with pain in labour. Immediate care of the newborn including skin to skin contact. Documentation specific to birth.

Clinical skills:

Skills to promote normal birth

Mechanism of labour

Principles of intrapartum skills; first, second and third stage including assessment of progress

Principles of drug administration in childbirth

Management of the third stage of labour

Examination of the placenta and membranes

Assessment and care of a woman and her baby in the immediate postnatal period

Female urinary catheterisation

Introduction to fetal monitoring and Cardiotocography

(K2 Medical Systems Fetal Monitoring Training Systems)

Documentation to include partograph.

\*\*\*Please note there is space for 1 student.\*\*\*

#### **NM4252 - INTRODUCTION TO SUPPORT STRATEGIES ACROSS THE LIFESPAN**

ECTS Credits: 6 (Year 1 Module)

#### **Nursing & Midwifery**

**Rationale and Purpose of the Module:** *The module explores the role of the nurse in supporting the person, transitioning through the lifespan.*

*Person centred care provision utilising the nursing process as applicable across the lifespan. In meeting the needs of individuals in a safe, legal, and ethical manner using the nursing process. Students will be introduced to policies, practices and procedures that directly influence the lives of people with intellectual disabilities.*

**Syllabus:** Definition and characteristics of a lifespan approach, theories of lifespan development e.g; Bronfenbrenner's. Person centred and health focused approaches to care. Nursing models and theories. Application of the nursing process towards understanding the needs/outcomes of individual/families person centred plans, health action plans, communication passports etc. Nursing care skills - assessment, observation, decision making, risk management and interventions in supporting individuals. International, national and local strategies to support the rights of people with ID. Development of age appropriate interpersonal, cross cultural and communication techniques and skills essential for communicating with persons with an intellectual disability, families, and colleagues. Person centred nursing skills Care planning underpinned by principles of person centred care Personalised, enabling and co-ordinated planning approaches Needs and Outcomes assessment, planning implementation and evaluation Introduction to nutritional assessment and support Case management skills; organisation, administration and relationship skills

\*\*\*Please note there is space for 4 students.\*\*\*

#### **Department of Nursing & Midwifery Year 2 Modules**

#### **NM4094 - OLDER PERSON NURSING: VALUE BASED PRACTICE**

ECTS Credits: 6 (Year 2 Module)

#### **Nursing & Midwifery**

**Rationale and Purpose of the Module:** *The aim of this module is to foster and connect students' understanding of healthy ageing and promote person centred nursing with older persons and their families across the care continuum.*

**Syllabus:** Valuing individuality, dignity, choice and diversity in later life, protecting and upholding rights of older people, autonomy and advocacy. Meaningful engagement with individuals, families and/or carers connecting intergenerational communities and society. Application of theories of ageing; role transitions and loss. Personal and relationship centred care. Promoting recovery, rehabilitation, wellbeing and choice. Mental and physical factors e.g. cognitive impairment, dementia, pain, falls prevention, vision and hearing loss. Elder abuse and neglect principles and interventions. Therapeutic modalities, dementia screening, polypharmacy, medication concordance. Interdisciplinary collaboration across the care continuum in environments that promote and support independence across community care settings; carer support. Communication and therapeutic strategies to support older person centred care.

\*\*\*Please note there is space for 4 students.\*\*\*

#### **NM4136 - RESPONDING TO COMPLEX NEEDS DURING THE POSTNATAL PERIOD**

ECTS Credits: 6 (Year 2 Module)

#### **Nursing & Midwifery**

**Rationale and Purpose of the Module:** *The aim of this module is to enable students to recognise and respond to complex needs of the woman during the postnatal period and to initiate appropriate management and escalate care in collaboration with other health care professionals.*

**Syllabus:** The midwife's role in the identification, care and management of women experiencing complex needs in the postnatal period. Physical health problems and complications in the postnatal period including secondary postpartum haemorrhage, postpartum thrombophlebitis, DVT and pulmonary embolism; postpartum pre-eclampsia/eclampsia; and postpartum thyroiditis.

Thromboembolic disease. Puerperal infection including wound infection and sepsis. Psychosocial and cultural needs of women experiencing complicated childbirth, Recognition and care of the critically ill woman. Complex postnatal care and medication management Clinical skills:

Management and care of the critically ill woman including homeostasis and fluid management and replacement including blood transfusion and oxygen therapy

Communication skills in the care of the critically ill woman

Management of severe sepsis and septic shock

Pharmacology Workshop

Wound care.

\*\*\*Please note there is space for 2 students.\*\*\*

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#### NM4134 - INTELLECTUAL DISABILITY ADULT NURSING

ECTS Credits: 6 (Year 2 Module)

#### Nursing & Midwifery

**Rationale and Purpose of the Module:** Building on previous knowledge this module addresses nursing aspects related to young and middle adulthood and specific support and intervention strategies required assisting in health and wellbeing of adults with an ID.

**Syllabus:** Theories of adulthood. Transition from adolescences, rights of the adult with an intellectual disability. Services to support community integration, empowerment, advocacy, autonomy and choice. Communication to support decision making in choosing a home, employment and parenting services, interpersonal relationships, marriage and parenthood. Therapeutic relationships and psychosocial supports for health and lifestyle decisions and health promotion activities in adulthood. Holistic case management; values based support; personal, health work and leisure. Safeguarding; recognising and responding to abuse.

\*\*\*Please note there is space for 4 students.\*\*\*

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#### NM4144 - INTELLECTUAL DISABILITY OLDER ADULT NURSING

ECTS Credits: 6 (Year 2 Module)

#### Nursing & Midwifery

**Rationale and Purpose of the Module:** Building on previous knowledge this module addresses nursing aspects related to nursing the older adult with intellectual disability and specific support and intervention strategies required assisting in health and wellbeing of the older adult.

**Syllabus:** Ageism, concepts and theories of ageing, physiological social and psychological changes associated with generic ageing and the older person with an intellectual disability. Nursing care and management of support for the older person with an intellectual disability. Person centred planning and the concept of choice and quality of life in older adulthood. Nursing process applied to the older person with an intellectual disability associated with age related illness and dementia macular degeneration. Living arrangements and service provision for the older person with an intellectual disability. The following concepts related to the older person with an intellectual disability; retirement, recreational and leisure pursuits, spiritual care, pastoral care and palliative care. Applied pharmacology.

Person centred nursing skills

Care planning underpinned by principles of person centred care

Health and wellbeing (engagement in activities of living, maintaining social connectedness)

Nutritional assessment and support of the older adult

Dementia assessment, care skills, care support planning

Health Promotion (communication skills: talking mats, reality orientation, reminiscence, fragility and falls assessment)

Bereavement support.

\*\*\*Please note there is space for 4 students.\*\*\*

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#### NM4154 - PROMOTING RECOVERY IN PERSONS EXPERIENCING PSYCHOSIS

ECTS Credits: 6 (Year 2 Module)

#### Nursing & Midwifery

**Rationale and Purpose of the Module:** The purpose of this module is to develop students' knowledge and understanding of the role of the psychiatric/ mental health nurse in supporting an individual experiencing psychotic disorder and their family/carer on the shared journey of recovery. The module will build on the knowledge gained in previous modules.

**Syllabus:** Person-centred and recovery-focused practice. Assessment and management of persons with psychotic disorders. Strengths based approaches. Early intervention for psychosis. The role of the nurse in providing psychosocial (e.g. CBT, family interventions, relapse prevention, social skills) and pharmacological interventions which facilitate recovery and well-being in persons with psychosis and their families\carers.

Collaboration with other health care professionals, service users, families and communities to provide culturally appropriate care for persons with psychotic disorders. Contemporary research findings and relevant health policy. Clinical Skills

Engaging persons who experience psychosis  
Biopsychosocial pharmacological recovery/strengths assessment and care planning

Relapse prevention

CBT for psychosis

Family interventions

Recovery focused interventions

Group interventions (e.g. social skills training, family work)

\*\*\*Please note there is space for 2 students.\*\*\*

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#### NM4164 - MENTAL HEALTH AND WELLBEING IN OLDER PERSONS

ECTS Credits: 6 (Year 2 Module)

#### Nursing & Midwifery

**Rationale and Purpose of the Module:** The purpose of this module is to develop students' knowledge and understanding of common mental health difficulties associated with the older person. The module aims to consider and discuss the most up to date evidence based

*assessment and treatment modalities in tandem with current health care policies so as to ensure quality, holistic, and safe nursing care for the older person experiencing mental health problems, and their families/carers across primary, secondary and tertiary health care settings.*

**Syllabus:** Mental health and healthy aging, diversity, spirituality, sexuality. Mental health difficulties that affect the older person; functional and cognitive disorders. The role of the mental health nurse caring for older people with mental health difficulties living in a variety of settings. The statutory and voluntary services in the care of the older person. Person-centered care. Recovery approaches to older person assessment, planning, interventions and evaluation. Falls prevention. Supporting older persons for optimal emotional, psychological and physical wellbeing. Palliative and end of life care. The concept of recovery and older people's narratives. Elder abuse. Support mechanisms for family and carers. Pharmacological and non-pharmacological interventions. National and international policies and strategies.

#### Clinical Skills:

Assessment (e.g. risk, nutritional, Mini-Mental State Examination) and care planning  
Meaningful person-centered activity planning for the older person

Therapies for the older person: e.g. reminiscence therapy, validation and reality orientation, working with Life history  
End of Life care/ last offices

\*\*\*Please note there is space for 2 students.\*\*\*

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#### NM4233 - FOUNDATIONS OF MATERNAL, CHILD, AND MENTAL HEALTH NURSING

ECTS Credits: 6 (Year 2 Module)

#### Nursing & Midwifery

**Rationale and Purpose of the Module:** *This module provides undergraduate general students with the opportunity to develop foundational knowledge in relation to three discrete areas of nursing: maternity, children and mental health nursing.*

**Syllabus:** Foundations of family centred care. Assessment and management of children and young people experiencing acute and long term conditions in collaboration with their parents. Effects of hospitalisation. Foundations of maternity and neonatal care. Protecting

women and children, roles and scope of practice. Fostering mental health and well-being as a continuum. An introduction to person centred mental health nursing, supporting individuals and families in distress affected by mental ill health. Access and referral care pathways and service. Introduction to promoting recovery. Introduction to strategies for individuals affected by mental ill health.  
**Skills**  
Maternal and paediatric early warning scores  
Examination of the baby  
Feeding and bathing babies/children  
Communicating with children  
Relaxation and self-care techniques  
Introduction to crisis intervention strategies

\*\*\*Please note there is space for 4 students.\*\*\*

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#### NM4243 - NURSING INDIVIDUALS LIVING WITH LONG TERM CONDITIONS

ECTS Credits: 6 (Year 2 Module)

#### Nursing & Midwifery

**Rationale and Purpose of the Module:** *This module will address person-centred nursing care of individuals with long term health conditions across hospital and community settings.*

**Syllabus:** Promoting health and wellbeing for individuals, living with and managing chronic pain, disability, co-morbidity and impairment in long term conditions across care settings. Assessment, care planning, therapeutic interventions supporting families and carers, psychosocial approaches; self-management and assisted technologies. Spirituality, concepts of hope, choice, resilience, empowerment and coping across disease trajectories. Collaborative multi-disciplinary team practice and recognising the need for escalation care. The nursing contribution in maximising the quality of life for persons living with long term conditions.

\*\*\*Please note there is space for 4 students.\*\*\*

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#### NM4264 - RESPONDING TO COMPLEX NEEDS DURING PREGNANCY

ECTS Credits: 6 (Year 2 Module)

#### Nursing & Midwifery

**Rationale and Purpose of the Module:** *The aim of this module is to facilitate students in the assessment, care and management of women experiencing at risk and complicated pregnancy.*

**Syllabus:** Assessment, investigations and management of maternal and fetal well-being in women experiencing at risk and complicated pregnancy including maternal mortality and morbidity. Bleeding before the 24th week of pregnancy; other problems associated with early pregnancy including antenatal infection. Antepartum haemorrhage. Hepatic disorders. Abnormalities of the amniotic fluid. Medical conditions of significance: hypertensive disorders; endocrine disorders; cardiac disease; renal disease; respiratory disorders; haematological disorders, neurological disorders; incorporating medication management. Documentation including use of IMEOWS.

#### Clinical skills:

Principles of management of bleeding including basic life support measures  
Management of severe pre-eclampsia, fulminating pre-eclampsia and eclampsia including medication management  
Management of epileptic seizures  
Management of an asthmatic attack  
Management of blood sugar monitoring, hypoglycaemia and hyperglycaemia.

\*\*\*Please note there is space for 2 students.\*\*\*

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#### NM4274 - OBSTETRIC COMPLICATIONS IN PREGNANCY AND CHILDBIRTH

ECTS Credits: 6 (Year 2 Module)

#### Nursing & Midwifery

**Rationale and Purpose of the Module:** *The aim of this module is to enable students to recognise midwifery and obstetric emergencies and initiate appropriate management and escalate care in collaboration with other health care professionals.*

**Syllabus:** The midwife's role in the identification, care and management of women experiencing complicated birth. Malpositions and malpresentations. Preterm labour including PPROM. Prolonged pregnancy and disorders of uterine action. Amniotic fluid embolism. Operative and assisted birth. Intrapartum and Primary postpartum haemorrhage. Multiple pregnancy and birth. Medication management in obstetric complications and emergencies.

#### Clinical skills:

Interpretation of fetal heart rate patterns and cardiotocograph

Mechanisms of malpresentations/malpositions

Management of shoulder dystocia

Management of breech birth

Management of presentation and prolapse of the umbilical cord;

Assessment and management of postpartum haemorrhage including estimation of blood loss

Manual removal of the placenta

Management of birth of twins

Application of principles of perioperative skills including cricoid pressure

Communication using ISBAR and Irish Modified Early Warning Scoring System (IMEOWS).

\*\*\*Please note there is space for 2 students.\*\*\*

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## NM4284 - REPRODUCTIVE HEALTH AND WELLBEING

ECTS Credits: 6 (Year 2 Module)

#### Nursing & Midwifery

**Rationale and Purpose of the Module:** The aim of this module is to enable the student to promote gynaecological and reproductive health and well-being and provide care for women with social, physical, emotional, intellectual, educational and healthcare needs.

**Syllabus:** The principles of health promotion and salutogenesis applied to midwifery. Provision of culturally sensitive midwifery care impacting sexuality fertility and childbearing. Review of the implications on health, pregnancy and parenthood for women with disabilities and disadvantaged groups. Gynaecological health and wellbeing; care for women with related problems to include, gynaecological cancers and sexually transmitted infections. Infertility and assisted reproductive technology. Contraception. Care of the woman

experiencing crisis pregnancy. Age and childbearing including teenagers and the older mother. Intimate partner violence in pregnancy. Effects of drug and alcohol misuse. Perinatal mental health.

\*\*\*Please note there is space for 2 students.\*\*\*

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## Department of Nursing & Midwifery Year 3 Modules

### NM4056 - CRISIS RESOLUTION AND RISK MANAGEMENT IN MENTAL HEALTH CARE

ECTS Credits: 6 (Year 3 Module)

#### Nursing & Midwifery

**Rationale and Purpose of the Module:** The purpose of this module is to develop students' knowledge and understanding of crisis and risk with a recovery focus. An underlying aim of the module is to encourage all students to make use of the best evidence and research available within this field to guide their practice and improve their understanding of crisis, risk and risk management in mental health care.

**Syllabus:** Crisis and risk theories applied to mental health; Core principles of crisis intervention and resolution; Therapeutic approaches to crisis intervention and resolution (solution focused approaches, cognitive behavioural approaches, future orientated, time limited, proactive, and person centred self- management tools, psychosocial and risk management); Risk assessment, management and person-centred safety planning applied to violence and aggression; suicide, self-harm. Positive risk management, risk and public concerns, reflection and nurse practitioners' wellbeing when working with crisis. Personal safety. Related pharmacology. Restraint, seclusion, special observation and legal requirements according to the Mental Health Act (2001). Contemporary research, best practice guidelines and relevant health policy.

#### Clinical Skills

Risk assessment self-harm, aggression  
Safety planning  
Problem solving

De-escalation skills

Special observations

Emergency response to self-harm and suicide attempts

\*\*\*Please note there is space for 1 student.\*\*\*

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### NM4036 - MEETING AND SUPPORTING THE PERSON WITH INTELLECTUAL DISABILITY AND COMPLEX NEEDS

ECTS Credits: 6 (Year 3 Module)

#### Nursing & Midwifery

**Rationale and Purpose of the Module:** Nurses are central in today's increasingly collaborative health care teams that place a premium on quality care and this module addresses the holistic management of multiple health conditions that persons with intellectual disability experience.

**Syllabus:** Acute and chronic physical illness; multiple and complex needs. Profiling disability related conditions, epilepsy, diabetes, nutrition, trends, health needs and provision of services. Approaches to assessments-and developing a comprehensive clinical impression, referral for specialist assessment; Nursing management of conditions related to trends, disability specific conditions; in addition to respiratory, metabolic and gastrointestinal conditions. Assessing, investigative and diagnostic procedures, planning interventions, evaluating plans and interventions of multiple health conditions. Case management of multiple and complex needs, multi-trans-inter disciplinary approaches.

#### Person Centred Nursing Skills

Person centred nursing approaches in comprehensive health assessment (physical health; head to toe and systems assessment approaches)

Nutritional care (nutritional tools and assessment, PEG, enteral feeding)

Continenence care (Skills and protocols of catheterisation, enema/suppository administration)

Reporting clinical impression

\*\*\*Please note there is space for 3 students.\*\*\*

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**NM4046 - SUPPORTING THE PERSON WITH INTELLECTUAL DISABILITY IN CHALLENGING BEHAVIOURAL OR MENTAL HEALTH SITUATIONS**  
ECTS Credits: 6 (Year 3 Module)

**Nursing & Midwifery**

**Rationale and Purpose of the Module:** *The aim of the module is to critically evaluate the role of the RNID in supporting individuals in challenging behavioural or mental health situations in the context of current attitudes policies and practices*

**Syllabus:** Human behaviour, adaptive and maladaptive responses. Positive Behaviour Support. Assessment of functional communication e.g. aggressive violent and self-injurious behaviours. Supporting individuals to communicate effectively e.g. Pecs. Behavioural therapies. Dual diagnosis, e.g. phobias, eating disorders, anxiety disorders, psychosexual disorders, perpetual and mood disorders, schizophrenia, depression. Attention deficit disorders with or without hyperactivity. Interventions e.g. cognitive therapies, risk management, use of restrictive practices, legal and ethical decision making, applied pharmacology. Multi-element plans in the context of person-centred planning and nursing process.

Legislation including capacity assessment and legislation pertaining to intellectual disability nursing practice across the life span continuum. Statutory regulations governing the rights and supports necessary to provide effective and compassionate care for a person with an intellectual disability, including the giving and refusing of consent to intervention and of a person's developmental and legal capacity.

Person centred nursing skills

Functional behavioural assessment

Mental health assessment incorporating use of mental health assessment tools

Practice assessment and management of the dynamics of risk.

Behavioural support strategies (positive behaviour support plans)

De-escalation techniques

Cognitive behavioural therapy

Relaxation techniques

\*\*\*Please note there is space for 3 students.\*\*\*

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**NM4086 - RESEARCH AND EVIDENCE IN HEALTHCARE**  
ECTS Credits: 6 (Year 3 Module)

**Nursing & Midwifery**

**Rationale and Purpose of the Module:** *This module will develop students understanding of research and evidence informing healthcare practice.*

**Syllabus:** Research skills development; cognitive and practical. Research terminology; processes and approaches; research methodology and methods. Systematic searching, hierarchy of evidence. Data extraction techniques; reviewing evidence; ethical principles and research integrity. Working with evidence and evidence based practice and translating evidence and research into practice.

\*\*\*Please note there is space for 3 students.\*\*\*

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**NM4096 - PERSON CENTRED APPROACHES TO REHABILITATION NURSING**  
ECTS Credits: 6 (Year 3 Module)

**Nursing & Midwifery**

**Rationale and Purpose of the Module:** *This module will explore person centred approaches in supporting individuals with rehabilitation care needs through primary, secondary and tertiary interfaces.*

**Syllabus:** Concepts of rehabilitation and recovery, individual values, preferences and choices. Assessment frameworks, therapeutic interventions and transitions of care across emergency and specialist departments and care teams using exemplars including COPD exacerbations and outreach care, Parkinson's disease, Multiple sclerosis. Stroke care, hip fracture and frailty syndrome, amputation, chronic renal disease, transplantation. Collaborative practice and coordination of care planning services across multidisciplinary teams; recovery and rehabilitation in partnership with families, carers, services and teams, connecting primary, secondary, and tertiary services, community, voluntary and support groups.

\*\*\*Please note there is space for 3 students.\*\*\*

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**NM4106 - PRINCIPLES OF PALLIATIVE CARE**

ECTS Credits: 6 (Year 3 Module)

**Nursing & Midwifery**

**Rationale and Purpose of the Module:** *This module is founded on the centrality of person centred approaches in supporting individuals and their families across a palliative care journey.*

**Syllabus:** Philosophy and frameworks for person and family centred palliative care. Psychosocial, spiritual and cultural dimensions in respecting individuality and choice along a personal journey. Communication and therapeutic relationships. Self-care for individuals families and practitioners. Collaborative decision making. Managing physical and psychosocial symptoms in promoting wellbeing, optimising comfort and quality of life. Death and dying a social and cultural perspective; individualised care planning in end of life care. Rituals, dignity and safety following death. Bereavement processes. Family/carer experiences of grief and loss.

\*\*\*Please note there is space for 3 students.\*\*\*

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**NM4116 - TRANSITION TOWARDS A COMPETENT PRACTITIONER**

ECTS Credits: 6 (Year 3 Module)

**Nursing & Midwifery**

**Rationale and Purpose of the Module:** *This module will provide students with a deeper understanding of contemporary professional roles and responsibilities related to clinical judgement and decision making. It will enable students to apply this knowledge in becoming a lifelong reflective learner and competent practitioner.*

**Syllabus:** Professional values and scope of practice; responsibility and expectations towards becoming a competent practitioner including continuing professional development. Reflective practice as a lifelong endeavour in fulfilling personal and professional accountability. Clinical judgement and decision making guiding practice; responding to, reporting and referring to incidents and practice events, developing resilience in sustaining therapeutic relationships in dynamic changing healthcare

environments. Approaches to adult learning, principles of preceptorship including the promotion of a quality clinical learning environment, models of supervision. Becoming a lifelong learner, practitioner and scholar.

\*\*\*Please note there is space for 3 students.\*\*\*

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#### **NM4155 - CONTEMPORARY MIDWIFE PRACTITIONER**

ECTS Credits: 6

#### **Nursing & Midwifery**

**Rationale and Purpose of the Module:** *The aim of this module is to provide students with opportunities to integrate practice in the care of women experiencing normal birth in the context of choice and risk.*

**Syllabus:** Normal childbirth evidence and debate. Physiological and normal birth and application to midwifery practice in all settings. Birthing options and services available for women at local, national and international level. Midwife's role in homebirth and in midwife led units. Decision making and risk assessment skills required for autonomous contemporary practice. Risk and choice paradox such as vaginal birth after caesarean section. Legal requirements of the midwife. Midwifery theories for practice. Complementary and alternative medicines applied to maternity care. Principles of adult education and application to parent education. Childbirth education for specific social and cultural groups. This module will incorporate the equivalent of four weeks clinical placement.

Clinical skills:

- Facilitating birth in the community setting
- Skills in facilitating physiological birth
- Consolidating skills for vaginal examination
- Indications and skills for episiotomy
- Introduction to perineal suturing
- Facilitation of childbirth education to specific groups.

\*\*\*Please note there is space for 4 students.\*\*\*

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#### **NM4165 - CHILD AND ADOLESCENT MENTAL HEALTH**

ECTS Credits: 6 (Year 3 Module)

#### **Nursing & Midwifery**

**Rationale and Purpose of the Module:** *The purpose of this module is to develop students' knowledge and understanding of common mental health problems associated with children and adolescents. The module will consider the most up to date evidence based assessments and treatment modalities in tandem with current health care policies to ensure quality, holistic, culturally sensitive and safe nursing care for children and adolescents with mental health problems and their families across primary, secondary and tertiary health care settings.*

**Syllabus:** Child development theories; risk and aetiological factors in the development of child/adolescent mental health problems (distress, emotional, behavioural and relationship factors). Caring for the child and adolescent with specific mental health difficulties (emotional disorders, disruptive behaviour disorders and developmental disorders). Assessment, planning, interventions and evaluation in child and adolescent mental health. Risk assessment, safety planning and promoting recovery. Effective communication and therapeutic engagement with children/adolescents and their families. Service provision in child and adolescent mental health. Therapeutic interventions with children, adolescents and families. Pharmacological interventions and monitoring the effects of medication. Legislation and national guidelines for child and adolescent health care in Ireland. Ethical and cultural issues when working with children and adolescence.

\*\*\*Please note there is space for 2 students.\*\*\*

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# Kemmy Business School



# Kemmy Business School

## Year 1 Modules

### AC4002 - MANAGERIAL ACCOUNTING

ECTS Credits: 6 (Year 1 Module)

#### Accounting & Finance

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

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

### AC4018 - CORPORATE TRANSPARENCY AND BUSINESS ETHICS

ECTS Credits: 6 (Year 1 Module)

#### Accounting & Finance

**Rationale and Purpose of the Module:** *1. Understand the control mechanisms of governance and financial transparency that infer the credibility of financial reporting.  
2. Acquire an overview of ethical theories and their*

*potential for engagement with business.*

- 3. Explore the elements of a professional judgement as an approach to making ethical decisions in business.*
- 4. Understand that corporate compliance is fundamental to corporate social responsibility.*

**Syllabus:** Corporate governance functions of responsibility, accountability and transparency. The role of the corporate board. Corporate architecture and mechanisms for governance and financial transparency. Understanding transparency mechanisms as instrumental in providing credibility to corporate reporting. Framing business ethics: Corporate responsibility, ethical decision-making. Normative ethical theories: utilitarianism, ethics of duty, rights and justice, virtue ethics, feminist ethics, discourse ethics and post-modernism. Professional independence and professional judgement and the distinction between the terms truth and truthful. Governance role of financial accounting information: impact on economic performance: project selection, information asymmetry. Threat of moral hazard: Agency theory, resource dependence, stakeholder theory. International and cultural dimensions to business ethical behaviour. Recognise business ethics as an element of corporate citizenship and sustainability; appreciating that corporate compliance is a cornerstone for corporate social responsibility. Bushman on corporate transparency, Bentham and Kant on utilitarianism, Lonergan on professional judgement. Roarty on language, Blackburn on truth.

**Prerequisites:** AC4001, AC4004, AC4305

### EC4102 - MACROECONOMICS

ECTS Credits: 6 (Year 1 Module)

#### Economics

**Rationale and Purpose of the Module:** *The purpose of this course is to introduce the student to the principles underlying the Macroeconomy. This is the study of how aggregate economic variables (such as the real growth rate, inflation and unemployment) inter-act and how the policy-maker (Government and Central Bank) can influence their behaviour. Following an introduction to the key macroeconomic variables and globalization, a model of how the macroeconomy operates (the theory of income determination) is developed. This model is then expanded at various stages to include the money market and the foreign exchange market. The expanded model*

*is used to discuss issues in macroeconomic theory and policy such as role and operations of the European Central Bank (ECB) and the relative importance of fiscal, monetary and exchange rate policies. The course concludes by discussing recent trends and economic issues relating to the Irish economy.*

**Syllabus:** Topic 1. Introduction to Macroeconomics Irish macroeconomy, political economy, macroeconomic constraints, globalization, macroeconomic models and the time horizon, a brief history.

Topic 2. National Income and Economic Performance Aggregate production function, measuring the output of nation's, the national income accounts, adjusting for inflation, the business cycle, the long-run performance of the Irish economy.

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

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

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

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

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

Topic 8. Fiscal Policy and Economic Planning in Practice:

### The Irish Record

Economic planning, Irish fiscal policy in historical perspective, is there such a thing as Expansionary Fiscal Contraction?, the end of history.

### Topic 9. Money and Banking

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

### Topic 10. Money and Interest Rates in a Closed Economy

The demand for money, money market equilibrium, nominal and real interest rates, aggregate demand and interest rates, monetary policy in a closed economy, crowding-out, government monetary financing.

### Topic 11. The Balance of Payments and the Exchange Rate

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

### Topic 12. Inflation and Interest Rates in Open Economies.

Purchasing power parity (PPP), PPP and the real exchange rate, harmonized competitiveness indicators, relative PPP, uncovered interest rate parity theory.

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

The growth of population, the standard of living , interpreting the record 1922-'61, the 1960s, the rec 'ord since 1971, the property and construction bubble 2001-'07, the great recession and its aftermath.

*Prerequisites: none*

## EC4112 - MACROECONOMICS (FOR NON-BUSINESS)

*ECTS Credits: 6 (Year 1 Module)*

### Economics

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

**Syllabus:**

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

12. The European Central Bank The design of the ECB; price stability; central bank independence; monetary policy in EMU.

*Prerequisites: EC4102*

## BR4031 - BROADENING BY UNDERSTANDING AND CONFRONTING CRISIS AND RISK

*ECTS Credits: 6 (Year 1 Module)*

### Management and Marketing

**Rationale and Purpose of the Module:** *The topics of risk and crisis are very much intertwined, and have a profound impact on individuals, institutions and society as a whole. Crisis is risk realised, and both are central factors affecting decision making. In addition, how a crisis is managed and portrayed in the media affects risk perceptions. This module gives a background of risk and crisis from multiple interdisciplinary perspectives including; economics, communications, journalism, history, neurology, and risk management. Students will understand the magnitude of risk and crisis within society, and how it transcends multiple contexts, and disciplines. This can only be achieved by an holistic examination of risk and crisis through multiple lenses. The students will learn how risk is portrayed, quantified, and processed. After this module, students will have an awareness of risk and risk information processing, how crises impact risk assessments, how risk is communicated in the popular media, and understand crisis response strategies. This course will have potential appeal and interest across the university, as it transcends disciplines. In the majority of courses, students have to debate and consider the issues of risk/crisis in their own primary discipline (e.g. engineering, politics, public health & medicine, psychology, business, law, sociology, maths, life sciences, etc.).*

**Syllabus:** Risk and crises are powerful forces that affect and shape human behavior, and society, defining the lives of people and institutions in the 21st century. Crisis is risk realised, and both are central factors affecting decision making. Students will understand the magnitude of risk and crisis within society, and how it transcends multiple contexts, and disciplines, analysing the topic from several different perspectives.

Students will gain knowledge of how individuals and organizations quantify and perceive risk, broadening their understanding of risk and crisis portrayal from a physiological, historical, economic, scientific, and communications perspective. The module comprises of six learning units; Risk in Society; Historical Perspectives of Risk & Crisis; Economic Perspectives of Risk & Crisis; The Neurobiology of Risk; Portrayal of Risk & Crisis in the Media; Risk and Crisis Communications. This module brings together insights from the fields of business, economics, communications, history, journalism, and medicine.

#### **MK4002 - MARKETING**

*ECTS Credits: 6 (Year 1 Module)*

#### **Management and Marketing**

**Rationale and Purpose of the Module:** *This module is designed to introduce students to the philosophy and historical underpinnings of marketing. As such, it will help students to position marketing both as an organisational discipline and as a societal force. The module will trace the development of marketing as a business philosophy and will assess the role of marketing within the international business organisation. Students will also explore what it means for organisations to be market-led. Finally, the module will delineate the rights and responsibilities of marketers and customers, and identify the role and impact of marketing in society.*

**Syllabus:** The syllabus provides coverage of the nature of marketing and, in particular, offers an historical backdrop to the development of the discipline. Next, students are introduced to the cornerstones of the discipline in the guise of the marketing concept and the marketing mix. Issues relating to marketing as organisational culture are considered with specific reference to marketing orientation and the barriers to developing such an orientation. The process of marketing in different contexts (service, industrial, international etc.) is discussed and differences highlighted. The consumer is introduced as the core target of marketing activity and relevant issues such as consumer sovereignty; consumer rights and the consumer movement are debated. On a macro level, issues relating to social responsibility and ethics are delineated. Finally,

the module addresses the thorny issue of how marketing adds value and what its contribution might be.

\*\*\*\*\*Please note that International students can enrol in either MK4002 or MK4006, but not in both modules.\*\*\*\*\*

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#### **MK4006 - MARKETING MANAGEMENT (NON BUSINESS)**

*ECTS Credits: 6 (Year 1 Module)*

#### **Management and Marketing**

**Rationale and Purpose of the Module:** *This module will provide non business students with an understanding of the key knowledge and skills involved in marketing management. The module will examine the strategic importance of marketing and explore the key challenges and contemporary issues surrounding the management of marketing.*

*The key objectives are:*

1. To explore the role of marketing management in the contemporary environment and investigate how marketers can manage environmental changes
2. To evaluate marketing's contribution in the creation of sustainable competitive advantage for different business contexts
3. To investigate the importance of marketing within the firm and the challenges surrounding the management of the marketing function
4. To provide students with an understanding of the role of marketing planning and implementation.

**Syllabus:** Building upon the foundations of marketing, this module takes a strategic approach to the theory and practice of marketing. The module introduces the concept of the marketing vision and explores the process of strategic analysis based on an assessment of key external and internal forces affecting the firm. An exploration of marketing strategy and the sources of competitive advantage follow with key competitive positioning strategies presented. The module focuses on understanding the management of the marketing function, the development of the marketing mix and the practice of marketing in terms of maximising value to customers and other stakeholders. Core areas to marketing management such as customer behaviour, brand management, services management and relationship marketing are examined. Key models and

theories related to marketing planning and implementation are explored.

**Prerequisites:** MK4603

\*\*\*\*\*Please note that International students can enrol in either MK4002 or MK4006, but not in both modules.\*\*\*\*\*

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#### **PM4022 - PRINCIPLES OF ORGANISATIONAL BEHAVIOUR**

*ECTS Credits: 6 (Year 1 Module)*

#### **Work & Employment Studies**

**Rationale and Purpose of the Module:** *This module is designed to give students an understanding of key concepts in Organisational Behaviour. It seeks to describe the complex work organisation from a behavioural perspective and it evaluates the methodologies available for analysing organisational behaviour. In an attempt to provide some answers to the why of human behaviour in the workplace, selected individual, group and organisational processes are introduced and explored*

**Syllabus:** Organisational Behaviour in perspective: Introduction to the field and paradigms of study; Defining the concept; disciplinarily and interdisciplinary nature of the field; dominant methodologies for understanding the social world. Personality: Defining personality; sources of personality difference; the nature/nurture debate. Perception and Cognition: The nature of perception; perception and perceptual influences; the process of perception. Motivation: theories of motivation; Learning & the Individual: Defining learning and theories of learning. Stress & Psychological Well being: stress at work; stress and performances; psychological well-being and self esteem. Groups & Team Roles: What is a group in psychological terms; function of groups; Hawthorne studies; the group formation process. Power, Politics and ethics: Interrelated concepts; sources of power; the use of power; political tactics and their use and legitimacy in organisational life. Leadership: theories of leadership; Organisational culture; diagnosing organisational culture; Schein's typology; formation and maintenance

# Kemmy Business School

## Year 2 Modules

### AC4024 - FINANCIAL ACCOUNTING AND REPORTING

ECTS Credits: 6 (Year 2 Module)

#### Accounting & Finance

**Rationale and Purpose of the Module:** *The aim of this module is to develop a student's understanding of the theoretical framework of accounting. It introduces the student to the translation of accounting theory, concepts and principles into accounting regulation and practice. It encourages the student to evaluate selected international accounting standards.*

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

### AC4034 - AUDITING AND ACCOUNTING FRAMEWORKS

ECTS Credits: 6 (Year 2 Module)

#### Accounting & Finance

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

**Syllabus:** Knowledge is imparted through lectures and tutorials and the completion of a case study requiring an

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

Prerequisites: AC4001, AC4002

### FI4012 - FOUNDATIONS OF AIRCRAFT LEASING

ECTS Credits: 6 (Year 2 Module)

#### Accounting & Finance

**Rationale and Purpose of the Module:** *Ireland has emerged as a leading centre in the aircraft leasing industry. At present, over half of all operating commercial aircraft are leased and over fifty percent of the world's leased aircraft are managed from Ireland. This module aims to provide students with a systematic coverage of the important aspects of aircraft leasing and explains why this financing mechanism has become a core competency when acquiring and managing aircraft.*

*Students will be introduced to the key concepts and processes involved in the efficient management of aircraft leasing. The module presents the framework for best practices from an aircraft lessee's perspective while appreciating the fundamental requirements for an aircraft lessor. The module will provide students with the tools to analyse the key constituent paths from selection of the asset, acquisition, securing, managing and finally divesting of the asset.*

*The major objectives of the module are:*

1. Outline the different mechanisms that are available to finance aircraft
2. Provide a thorough examination of the aircraft and engine leasing market
3. Provide a comprehensive analysis of the content of an operating and financial lease and the factors to be

*considered when negotiating these leases.*

**4. Explain how aircraft are financially valued and the dynamics of aircraft valuation throughout their economic life.**

**Syllabus:** Development of the aircraft and engine leasing industry; Different ways to finance aircraft; Characteristics of the different types of Aircraft Leases; Selecting and acquiring the asset; An in-depth analysis of an Operating Lease; Analysis of a Financial Lease; Engine Leasing; Financial and technical issues arising in the context of lease negotiations; Legal status of aircraft, jurisdiction, nationality, registration and securing the asset; Maintenance reserves; Return conditions of aircraft; Formulation and negotiation of lease contracts and letters of intent; Managing the asset; Aircraft Repossession; Divesting the asset from lessor and lessee perspectives; Aircraft valuation - factors affecting aircraft residual value through the economic cycle and residual value forecasting.

### IN4004 - INSURANCE LAW AND CLAIMS

ECTS Credits: 6 (Year 2 Module)

#### Accounting & Finance

**Rationale and Purpose of the Module:** *1. To develop in the student an understanding of and insight into the insurance law and claims processes*

*2. To examine the nature of the interface between insurance organisations and regulators.*

*3. To introduce students to the practice of insurance claims departments. Stress will be given to the achievement of appreciation of recent developments in the field.*

**Syllabus:** Provide the student with an understanding of the claims process and the law of insurance applying to Ireland. Additionally, effective investigation and negotiation techniques are taught to implement the complexities of law to give practical application scenarios. Personality and behaviour are analysed so that a negotiator or investigator can formulate optimum tactics in their vocation.

Prerequisites: IN4003

### IN4014 - LIFE INSURANCE

ECTS Credits: 6 (Year 2 Module)

## Accounting & Finance

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

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

**Prerequisites:** IN4003

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## EC4014 - INTERNATIONAL ECONOMICS

ECTS Credits: 6 (Year 2 Module)

### Economics

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

**Syllabus:** The module is divided into six sections set out below. Each topic will have a corresponding problem sheet which students should work through as an aid to

understanding the material presented in lectures. Further detailed references and readings for each topic, where relevant, will be given in lectures.

### Section I Introduction and Context

#### Topic 1 Introduction and Context

### Section II International Trade Theory

#### Topic 2 Comparative Advantage

#### Topic 3 The Standard Trade Model

#### Topic 4 The Heckscher-Ohlin Trade Model

### Section III International Trade Policy

#### Topic 5 Tariffs

#### Topic 6 Nontariff Trade Barriers

### Section IV Integration and Investment Relations

#### Topic 7 Economic Integration

#### Topic 8 International Resource Movements

### Section V Balance of Payments and Exchange Rates

#### Markets

#### Topic 9 Balance of Payments

#### Topic 10 Foreign Exchange Markets and Exchange Rates

### Section VI The International Economy in Operation

#### Topic 11 Exchange Rate Regimes

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## EC4044 - APPLIED ECONOMIC ANALYSIS

ECTS Credits: 6 (Year 2 Module)

### Economics

**Rationale and Purpose of the Module:** *This module broadens and deepens the knowledge of intermediate micro and macro economics gained from EC4004, Economics for Business, as well as introducing key tools*

*for applied analysis of economic data.*

**Syllabus:** The objective of this module is to deepen and broaden students' knowledge from the intermediate micro and macroeconomics learned in EC4004.

Lectures: Week 1 Consumer Theory

Week 2 Producer Theory

Week 3. Markets, exchange

Week 4. General Equilibrium, Computable General Equilibrium

Week 5. Game theory and Policy

Week 6. Assymetric Information

Week 7. Long Run 1: The "Solow Model" with Human Capital

Week 8. Long Run 2: The Ramsey Problem

Week 9: Medium and Short Run: IS/MP/PC Model with uncertainty

Week 10: Policy Application: Open economies in monetary unions

Week 11: Policy Application: funding pension systems in ageing societies

Week 12: Policy Application: Hyperinflations, deflations.

Labs: Weeks 3-6, mathematical prerequisites, 7-9, Data-based labs, 9-11, writing workshops.

**Prerequisites:** EC4101, EC4102, EC4004

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## EP4003 - ENTREPRENEURSHIP AND INNOVATION

ECTS Credits: 6 (Year 2 Module)

### Management and Marketing

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

**Syllabus:** This module commences with an introduction to the nature and development of entrepreneurship and

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

#### **MG4604 - AIR TRANSPORTATION**

*ECTS Credits: 6 (Year 2 Module)*

#### **Management and Marketing**

**Rationale and Purpose of the Module:** *To provide students with an appreciation and analysis of the air transport industry structure, competition, technical and commercial issues facing companies involved in the sector, complimenting existing knowledge of aeronautical engineering:*

#### **Syllabus:**

Overview of the international aviation industry including air transport, airports, aerospace manufacturing, maintenance and other aviation services. History of aviation including the development of national and international regulations of civil aviation. The advent of deregulation and liberalization of air transport markets to produce open skies. The characteristics of airline operations, airline costs, passenger demand, marketing strategies and pricing fare policies. The use of gantt charts, bills of material (BOM) and the principles of FIFO within the air transport sector. Air transport in Ireland and the current international air transport industry structure, competition, emerging trends and future prospects

#### **MK4004 - CONSUMPTION AND CONSUMER CULTURE**

*ECTS Credits: 6 (Year 2 Module)*

#### **Management and Marketing**

**Rationale and Purpose of the Module:** *This course aims to provide coverage of the nature of consumer*

*culture.*

- \* *To reflect the general shift within consumer culture in the basic emphasis of economic systems from exchange or production to consumption.*
- \* *To define the domain of consumer behaviour, including some areas of interest to consumer behaviour researchers, policymakers, and marketers.*
- \* *To provide coverage of the circle of consumption and how consumption relates to other technological and economic processes.*
- \* *To explore contemporary theories of consumption.*
- \* *To encourage students to critically reflect upon their own consumption.*

**Syllabus:** The Circle of Consumption; Motivational Dynamics; Culture; Cultural Values; Myths & Symbols; Cultural Rituals; Types of Meanings; Meaning Transfer; Strategic Analysis of Consumers; Self Concept; Subcultures of Consumption; Lifestyles; Embodiment & Consumption; Classic Theories of Motivation; Consumer Motives in Cultural Perspective; Involvement; Consumer Experience; Consumer Learning; Purchasing; Gift Exchange; Organisational Consumption; Family & Household Consumption; The Social Context of Personal Consumption; Tools of Influence; Reference Groups; Innovation; Adoption and Diffusion; Resistance; Compulsive Consumption; The Disposition Process; Profiles of Disposition Behaviours; Factors Affecting Disposal Choices.

**Prerequisites:** MK4002

#### **MK4025 - MARKETING COMMUNICATIONS**

*ECTS Credits: 6 (Year 2 Module)*

#### **Management and Marketing**

**Rationale and Purpose of the Module:** *To introduce students to communications theory.*

*To establish the fundamentals of marketing communications.*

*To explore the nature and influence of the institutions of consumer culture*

*To consider different marketing communications techniques and be cognisant of contemporary trends in the field.*

*To investigate alternative understandings of advertising. To demonstrate how different communications techniques can be combined and interrelated to form the*

*basis of positive international marketing communication strategies.*

*To appreciate the impact which marketing communications have on our lives.*

**Syllabus:** Role of communications, communications theory, audiences, how advertising works, the management of marketing communications, the advertising industry, creative aspects of advertising, media aspects of advertising, ethics and advertising standards, communication vehicles- (sponsorship, public relations, direct marketing, consumer sales promotions, trade shows and exhibitions, internet marketing communications tool, internal marketing communications), integrated marketing communications, the planning and management of an integrated marketing communications plan, the effects and effectiveness of marketing communications, future developments in marketing communication.

#### **PM4054 - APPLIED ORGANISATIONAL BEHAVIOUR**

*ECTS Credits: 6 (Year 2 Module)*

#### **Work & Employment Studies**

**Rationale and Purpose of the Module:** *The purpose of this module is to enhance students understanding of key concepts and issues associated with behaviour in organisations. The specific objectives are to focus on the role of individual behaviour, specifically on personality, perception and motivation, and to increase students understanding of group dynamics in the international workplace, paying particular attention to the dynamics of communication, groups, conflict, and leadership. Participants will become acquainted with theories, concepts and methods through both didactic and experiential learning techniques.*

**Syllabus:** The syllabus allows for the treatment of a small number of critical dimensions of organisational behaviour. Building on material covered in an earlier organisational behaviour module, the module explores a number of processes and issues associated with individual and group behaviour in organisations. It explores the following areas: the development of the individual: personality and individual difference, perception, attitudes, the psychological contract and individual motivation. Group development: structures and roles, the dynamics of groups and teams, communication processes particularly in an intercultural

context. organisational leadership and organisational citizenship behaviour are also examined.

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## Kemmy Business School Year 4 Modules

### AC4418 - MANAGEMENT ACCOUNTING 2

ECTS Credits: 6 (Year 4 Module)

#### Accounting & Finance

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

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

Prerequisites: AC4417

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### EC4018 - MONETARY ECONOMICS

ECTS Credits: 6 (Year 4 Module)

#### Economics

**Rationale and Purpose of the Module:** This course in Monetary Economics covers topics in Financial Markets, Financial Institutions, Central Banking, International Finance and Monetary Theory. These topics are discussed at various stages in the course. The central theme is to develop a dynamic monetary model of a

small, open economy. The Course Outline (see below) explains how this is achieved and at what point the other topics are examined. Among the policy issues discussed are: economic adjustment to asymmetric shocks given the constraints of monetary union; the operations and policies of the European Central Bank; the transmission of monetary policy in the Euro-area; and the determination of interest rates.

**Syllabus:** 1. Introduction to the Theory of Income Determination

- &bull; Equilibrium in the Goods and Services Market
- &bull; Deriving the SRAS model
- &bull; Adjusting to Demand-side Shocks
- &bull; Adjusting to a Supply-side Shock

2 Money and Banking

- &bull; Money Creation in a Modern Economy
- &bull; The money multiplier
- &bull; The Role of a Central Bank
- &bull; Seigniorage
- &bull; Lender of last resort
- &bull; High-powered Money and the Money Multiplier
- &bull; Instruments of Monetary Policy

3 Money and Interest Rates in a Closed Economy

- &bull; The Demand for Money
- &bull; Money Market Equilibrium
- &bull; Aggregate Demand and Interest Rates
- &bull; Monetary Policy and the Keynesian, Classical Debate
- &bull; Monetary Financing

4 The IS-LM Model

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

5 The Phillips Curve and the Inflation-Unemployment Trade-off

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

&bull; The Phillips Curve and the AD-AS Model

6 The Mundell-Fleming Model

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

Guest Lecture Dr Alan Ahearne NUI, Galway

- &bull; How has the ECB responded to the financial crisis? Long term refinancing operations (LTRO) and Outright Monetary Transactions (OMT).

&bull; How has the Federal Reserve responded to the financial crisis? Quantitative easing (QE).

Guest Lecture John Rowe Financial Markets Division, Central Bank of Ireland

- &bull; Monetary Policy Framework
- &bull; National Central Bank's and the Liquidity Position of Commercial banks.
- &bull; Forecasting Liquidity Facilities.
- &bull; Reaction of Central Bank's to the Financial Crisis.

7 European Monetary Union and the European Central Bank

- &bull; The Political Benefits of EMU to Ireland
- &bull; The Economic Benefits of EMU to Ireland
- &bull; The Economic Costs of EMU
- &bull; The European Central Bank
- &bull; ECB Independence
- &bull; How Interest Rates Are Set in the Euro Area
- &bull; Monetary Policy in EMU
- oThe Euro Area Inflation Record
- oOne Monetary Policy Fits All?

8 A Dynamic Monetary Model of Aggregate Demand and Aggregate Supply

- &bull; The Dynamic Model of Aggregate Demand and Aggregate Supply
- &bull; The Dynamic Aggregate Supply (DAS) Curve
- &bull; The Dynamic Aggregate Demand (DAD) Curve
- &bull; Deflationary Demand-side Shock
- &bull; The Central Bank's Inflation Target
- &bull; An Expansionary Demand-side Shock
- &bull; The Labour Market and the Adjustment Process

9 Savings, Investment and the Balance of Payments

- &bull; Savings and Investment in a Closed Economy
- &bull; Saving, Investment and the Balance of Payments
- &bull; The Interest Rate and Capital Flows
- &bull; The Real Exchange Rate and Net Exports
- &bull; Savings and Investment in the Small, Open Economy
- &bull; The Effects of Fiscal Policy
- &bull; The Effects of a Change in the World Interest Rate
- &bull; Applying the Model to the Irish Economy in EMU
  
- 10. The Economic Crash of 2008 and Its Aftermath
- &bull; The Property Boom
- &bull; Displacement
- &bull; Credit expansion
- &bull; Euphoria
- &bull; Financial Distress
- &bull; Revulsion
- &bull; Coping With the Fiscal Crisis
- &bull; Coping With the Banking Crisis
- &bull; The Troika Agreement
- &bull; Is the Irish National Debt Sustainable?
- &bull; No-one Shouted 'Stop'
- &bull; Specific Policy Failures

*Prerequisites:* EC4102, EC4004

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

*ECTS Credits:* 6 (Year 4 Module)

##### **Economics**

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

*seeks to provide the student with a balanced and objective analysis of the main issues confronting the world economy and through the use of economic theory, empirical evidence and objective analysis seeks to distinguish between fact and fiction.*

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

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

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

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

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

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

*Prerequisites:* EC4102, EC4101

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#### **EC4408 - PUBLIC FINANCE**

*ECTS Credits:* 6 (Year 4 Module)

##### **Economics**

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

**Syllabus:** 1. Pareto Optimality, General Equilibrium, Social Welfare Functions,  
2. Allocative Role of Government - Market Failures: Public Goods, Externalities, Natural Monopolies,  
3. Cost Benefit Analysis,  
4. Taxation: Incidence and Partial Equilibrium, Taxes on Labour, Taxation and the incentive to work.  
5. The Welfare State: Tax and Social Welfare Systems, Fiscal Measures to Reduce Poverty and Inequality.  
6. Economics of Regulation.

*Prerequisites:* EC4101, EC4102, EC4004

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#### **EP4008 - BUSINESS CONSULTING**

*ECTS Credits:* 6 (Year 4 Module)

##### **Management and Marketing**

**Rationale and Purpose of the Module:** Small and medium sized enterprises are constantly evolving and seeking new opportunities to expand and develop their existing businesses which requires external expertise and advice. This advice can range from guidance on new market and product development to overall strategy development, implementation and evaluation; how to develop growth strategies; and to gain objective and expert advice on how they can implement change in their firm successfully. This module will introduce students to the principles and processes of management consultancy and provide them with the opportunity to adopt the role of a professional management consultant, to apply experiential knowledge and concepts learned in the classroom to real-life business situations.

**Syllabus:** The aim of this module is to provide students with an understanding of the business consulting process and gain knowledge and expertise in how to manage a business consulting project efficiently and effectively. The module will address the following topics: the nature of business consulting; the skills of an effective consultant; developing a research consultancy contract ; managing the client-consultant relationship; the stages of consulting process; problem diagnosis and solution development; Project planning; Identifying and evaluating recommendations and their implementation; the ethics of conducting business consulting.

#### EP4408 - SMALL BUSINESS CONSULTING

ECTS Credits: 6 (Year 4 Module)

#### Management and Marketing

**Rationale and Purpose of the Module:** *The aim of the module is to provide participants with an understanding of both the business planning and consultancy process. Students will act as consultants for existing SMEs. In undertaking the consultancy project, students benefit enormously from this experience as they have the opportunity to apply experiential knowledge and concepts learned in the classroom to real-life business situations.*

**Syllabus:** Knowledge is structured in two main sections, Theory and Application of Consultancy. Initially major consulting concepts and models are imparted, following which students work together in groups engaging in experiential learning acting as consultants for an external SME.

#### FI4008 - EMPIRICAL FINANCE

ECTS Credits: 6 (Year 4 Module)

#### Accounting & Finance

**Rationale and Purpose of the Module:** *The course provides students with a thorough grounding in the empirical study of international financial markets to prepare them for potential careers as traders, risk-*

*managers, quantitative analysts, stockbrokers, fund managers, etc in the financial services industry. The learning experience is enhanced through the learning-by-doing experiences of course participants through a mix of computer workshop-oriented tutorials and labs, and interactive web-based simulations.*

**Syllabus:** Introduction to Financial Statistics: measures of location and spread, common probability distributions, understanding probability density functions, importance of higher-order moments in financial modelling. Application of probability distributions in financial modelling. The linear regression model and parameter estimation. Fundamentals of model specification testing. Financial modelling in volatile markets. Introduction to lattices (binomial/trinomial trees), their use in the representation of stochastic processes and their applications in basic derivative security valuation. Real options theory. Hedge funds.

#### IN4008 - REINSURANCE / ART

ECTS Credits: 6 (Year 4 Module)

#### Accounting & Finance

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

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

Statistical analysis of pure risk exposures, including computer based simulations of possible loss scenarios; selection of relevant risk transfer measures; underwriting techniques; exercises in reinsurance/alternative risk transfer programming.

Prerequisites: IN4003, IN4015

#### IN4418 - RISK CONTROL AND UNDERWRITING

ECTS Credits: 6 (Year 4 Module)

#### Accounting & Finance

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

**Syllabus:** Acquire a comprehensive understanding of the underwriting process within the context of risk management.

Material damage insurance and risk control  
Loss of Profits  
Pecuniary insurance  
Liability insurances  
Loss reserve management  
Principles of insurance pricing

Prerequisites: IN4015

#### MG4037 - STRATEGIC MANAGEMENT

ECTS Credits: 6 (Year 4 Module)

#### Management and Marketing

**Rationale and Purpose of the Module:** *To provide students with a significant understanding of the role and importance of strategic management in contemporary organisations. To enable students to integrate functional specialisms into an appreciation and application of strategy*

processes in both the private and public sector.

**Syllabus:** Multi-perspective nature of strategy, strategic dimensions, strategy processes, theories of business level competitive advantage - market positioning, resource-based and the dynamic capabilities approach. Strategic options and decision making, implementation issues: resource allocation, stakeholder management, strategic control, and change management. Strategic cultures and paradigms, the role of the strategist. Corporate-level strategy, multi-business structures and coherence, Organisational and Environmental Turbulence, Scenario Planning and future thinking.

#### MI4408 - STRATEGY AND KNOWLEDGE MANAGEMENT

ECTS Credits: 6 (Year 4 Module)

##### Management and Marketing

**Rationale and Purpose of the Module:** To provide a strategic perspective on the role of knowledge, information and technology in organisations. Develop the role played by technology in market and organisational transformation. Develop planning processes for the strategic use of the information resource. Provide students with an appreciation of the need to manage knowledge as an organizational resource and the infrastructural requirements to facilitate this.

**Syllabus:** The role of technology, information and knowledge in a strategic context; technological change and the transformation of organisations and markets in the networked economy; techniques and frameworks for strategic planning of the information resource; the nature of knowledge as an organizational capability; models and conceptual frameworks for knowledge management; knowledge management systems; knowledge codification; the transfer of knowledge at an individual, group, organizational and inter-organizational level; cross cultural knowledge management; changing use of systems due to knowledge intensity; communities of knowing; implications for knowledge systems in support of non-traditional/emerging organizational structures. The above concepts will be reinforced and developed through the use of various software packages including web, intranet and knowledge portal software

systems.

Prerequisites: MI4407

#### MK4017 - MARKETING LEADERSHIP

ECTS Credits: 6 (Year 4 Module)

##### Management and Marketing

**Rationale and Purpose of the Module:** This module aims to underline the strategic importance of marketing. To this end, it aims to investigate the relationship between marketing and the other functional areas within the business. Further, it seeks to delineate the nature of the marketing management process and to explore the role of marketing planning. Finally, the module attempts to critically evaluate the marketing vision.

**Syllabus:** The module addresses the marketing vision and suggests how the marketing planning and management process contribute to and deliver upon such a vision. Next the module addresses the relationship between marketing and the other functional areas, and assesses the role of marketing in the boardroom. The module also considers value-based marketing and the application of marketing techniques internally within the organisation's marketing. As such the module will critically consider the potential for organisational renewal through marketing.

Prerequisites: MK4002

#### MK4038 - MARKETING RELATIONSHIPS AND NETWORKS

ECTS Credits: 6 (Year 4 Module)

##### Management and Marketing

**Rationale and Purpose of the Module:** 1. To introduce relational approaches to marketing. 2. To understand the nature and importance of interaction in service, intra-organisational and mass marketing contexts. 3. To understand the process of relationships development and to appreciate relationship success variables and how they might be fostered.

4. To consider approaches to relationship management including CRM.

5. To understand competitive and collaborative networks and the strategic implications for individual organisations.

6. To appreciate the implications of marketing when viewed as relationships and networks.

**Syllabus:** Service Logic in Marketing. Relationships and Networks as source of innovation. Relationship Development. Relational capabilities. Intra-organisational and inter-organisational interaction and relationships. Relationships success variables including trust, commitment and shared values. Cultural dimensions to relationships. Collaborative and competitive networks. Relationship marketing strategy and Customer Relationship Management. Comparing B2B, B2C and C2C interaction in networks.

Prerequisites: MK4002

#### PM4008 - EMPLOYMENT RELATIONS PRACTICE

ECTS Credits: 6 (Year 4 Module)

##### Work & Employment Studies

**Rationale and Purpose of the Module:** Explore the key operational practices in the conduct of employee relations.

Examine the issue of conflict in the context of the employment relationship.

Expose students to theory and practice of negotiation and conflict handling.

Appreciate the role of negotiation in the conflict resolution process.

Allow for a knowledge of the key 3rd party institutions in the context of workplace conflict resolution.

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

## **PM4098 - CONTEMPORARY HUMAN RESOURCE MANAGEMENT: CONTEXT AND STRATEGY**

ECTS Credits: 6 (Year 4 Module)

### **Work & Employment Studies**

**Rationale and Purpose of the Module:** This module seeks to develop analytical and conceptual capabilities in the domain of human resource management (HRM). The purpose of the module is to integrate knowledge and competence from previous modules (both within and beyond HR, e.g. strategic management, financial planning, etc.) and from work experience and to integrate them in a way that enhances students' capacity to analyse key HR issues in a wider national and international context. Students are required to critically evaluate key contemporary issues in HRM literature and to examine recent research on trends and developments in HRM/employment relations within both an Irish and international context. The module is strongly focused on strategic aspects of HRM, its application in practice and critical evaluation thereof, using an evidence-based perspective.

**Syllabus:** Introduction & course overview; Introduction to key concepts of HRM The changing context of work and HRM; Contemporary influences on HRM; Strategy and strategic HRM; Models of strategic HRM; HRM and industry dynamics; Changing labour markets; International HRM; Annual Lovett lecture; diversity; strategic HR planning; rewards; performance management; talent management; guest lectures addressing recent research findings and evidence-based HRM.

## **PM4108 - THE PSYCHOLOGY OF CAREER SUCCESS**

ECTS Credits: 6 (Year 4 Module)

### **Work & Employment Studies**

**Rationale and Purpose of the Module:** The purpose of this module is to introduce students to a range of theoretical concepts within the field of career theory. It is also intended to give students an understanding of the tension between active career self-management and contextual constraints and opportunities within the world

of work. Students will use the theoretical concepts and explanations to evaluate factors influencing subjective and objective career success at various life stages, in various local and international contexts, and within and outside of organisations. They will consider careers from their own perspective as well as from the perspective of an external career coach and an internal HR manager.

**Syllabus:** Career concepts and definitions; changing landscape of careers including traditional versus protean/boundaryless perspectives; careers from individual and organisational perspectives; entrepreneurial careers, fast-track careers and expatriate careers across international borders; different meanings of career success; occupational and organisational choice including psychometric assessment; stage based theories of career development; career development model; individual and organisation-sponsored approaches to career exploration; career goals, career indecision and career competence, career strategies and their implications for individuals and organisations; career appraisal; career and life stage challenges and concerns; contemporary issues in career management including stress, work-family interaction and diversity; role of strategic human resource management systems in career management; role of career coaches and consultants.

## **TX4008 - INTERNATIONAL TAX**

ECTS Credits: 6 (Year 4 Module)

### **Accounting & Finance**

**Rationale and Purpose of the Module:** The aim of the module is to give students an understanding of the principles underpinning, and the risks inherent in, double taxation relief and other international tax issues including EU tax harmonisation, the implications of the single market, the impact of offshore business, transfer pricing and trends in world tax systems.

**Syllabus:** Explanation of the Irish domestic legislative provisions which govern the territorial rules for assessing individuals and companies to income tax /corporate tax and capital gains tax; Concept of double taxation and foreign tax credit relief including both bilateral and unilateral reliefs; Interpreting the OECD Model Double Taxation Convention and explaining how companies can interpret domestic laws in different jurisdictions and relevant conventions to create tax planning

opportunities; Explaining the concept of Transfer pricing and the rationale behind the CCCTB; Explaining the different territorial rules in other countries explaining residence , source and territorial concepts ; Considering other countries anti deferral tax rules including Controlled Foreign Company legislation; Evaluation of the types of business models used by multinational companies to reduce their global effective rate of tax; Explain the rationale for changes in both domestic and International Tax legislation and policy in relation to corporates and individuals.

## **TX4407 - CORPORATE TAXATION**

ECTS Credits: 6 (Year 4 Module)

### **Accounting & Finance**

**Rationale and Purpose of the Module:** This module aims to provide a detailed understanding of the principles underpinning the computation of the liabilities of companies to Corporation Tax, VAT and Capital Gains Tax. To compute corporate tax liabilities, including the utilisation of available reliefs such as Research and Development and relief for losses. To understand Close Company legislation and related liabilities. To understand the residency rules for corporates, including relevant international tax planning. To understand the tax implications of business incorporation and related planning.

**Syllabus:** This module covers:

The advantages and disadvantages of incorporation of a business; the principles underpinning the taxation of Irish companies, computing tax liabilities on trading income, non-trading income and capital profits. Payment of tax and filing of returns. Tax relief for investment in Research and Development (R&D).

Relief for losses, including terminal loss and Group relief. Close company legislation and the consequences of Close Company status.

An introduction to Capital Gains Tax, both for individuals and companies. Computation of gains and use of losses.

An introduction to Value Added Taxation (VAT). Overseas aspects of Company taxation. A review of selected case law and topical issues of relevance to company taxation in Ireland.

**Prerequisites:** TX4305

## Faculty of Science and Engineering



# Biological Sciences Year 1 Modules

## BY4002 - BIOLOGY 2

ECTS Credits: 6 (Year 1 Module)

### Biological Sciences

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

**Syllabus:** Cellular reproduction; binary fission, mitosis and meiosis. Introduction to genetics; Mendelian inheritance, chromosomes and genes, mutations. DNA; structure, replication and organisation in cells. Gene activity; the genetic code, transcription, translation and expression. Plant structure and function; transport in plants, reproduction, seed structure, germination, growth and development, plant adaptations.

Introduction to taxonomy and classification. Introduction to animal kingdom (Protozoa, Porifera, Cnidaria, Platyhelminthes, Nematoda, Annelida, Mollusca, Echinodermata, Arthropoda, Chordata). Introduction to fungi, algae and plants (Bryophyta Pterophyta, Coniferophyta, Anthophyta). Evolutionary theories, evidence for evolution, evolutionary process, origins of life. Principles and scope of ecology; ecosystems; cycles in nature; energy flows; population and community dynamics; limiting factors; food chains: succession, environmental concerns.

**Prerequisites:** BY4001

\*\*\*Lab numbers are capped at 2-3 students.\*\*\*

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## BY4102 - BIOLOGY FOR BIOSCIENCES

ECTS Credits: 6 (Year 1 Module)

### Biological Sciences

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

**Syllabus:** Cellular reproduction; binary fission, mitosis and meiosis. Introduction to genetics; Mendelian inheritance, chromosomes and genes, mutations. DNA; structure, replication and organisation in cells. Gene activity; the genetic code, transcription, translation and expression. Plant structure and function; transport in plants, reproduction, seed structure, germination, growth and development, plant adaptations.

Introduction to taxonomy and classification. Introduction to animal kingdom (Protozoa, Porifera, Cnidaria, Platyhelminthes, Nematoda, Annelida, Mollusca, Echinodermata, Arthropoda, Chordata). Introduction to fungi, algae and plants (Bryophyta Pterophyta, Coniferophyta, Anthophyta). Evolutionary theories, evidence for evolution, evolutionary process, origins of life. Principles and scope of ecology; ecosystems; cycles in nature; energy flows; population and community dynamics; limiting factors; food chains: succession, environmental concerns.

**Prerequisites:** BY4001

\*\*\*Lab numbers are capped at 2-3 students.\*\*\*

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## BY4214 - PRINCIPLES OF HUMAN NUTRITION

ECTS Credits: 6 (Year 1 Module)

### Biological Sciences

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

**Syllabus:** This module will examine nutrients, their function, metabolism and food sources as well as discuss the latest research in the role of nutrition for the promotion of optimal health and prevention of disease. The absorption, digestion and essential functions of the macronutrients (carbohydrate, protein and lipids) and the micronutrients (vitamins and minerals) will be explored. Changes in nutritional requirements at different stages of the life cycle will be discussed as well as

special needs during pregnancy, lactation and aging. The impact of nutrition and food on the promotion of health and the prevention of disease will be fully explored. Topics covered include: energy requirements, carbohydrates, protein, lipids, absorption, digestion and metabolism of nutrients, vitamins, minerals, water, dietary standards, heart disease, cancer, obesity, maternal nutrition/lactation, infant/childhood/teenage nutrition

**Prerequisites:** BY4001, BY4002, CH4102

\*\*\*Lab numbers are capped at 2-3 students.\*\*\*

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## EV4024 - EQUINE REPRODUCTION

ECTS Credits: 6 (Year 1 Module)

### Biological Sciences

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

**Syllabus:** The syllabus is comprised of the following: reproductive anatomy of the mare and stallion, reproductive endocrinology of the mare and stallion, oestrous cycle, fertilization, pregnancy, parturition; neonatal physiology; male reproductive physiology and practical aspects of equine breeding management. The management of brood mares and stallions are presented from a physiological and husbandry perspective. The events at parturition are presented and discussed in the context of the management of the neonatal foal and the early return of the mare to reproductive activity.

\*\*\*Lab numbers are capped at 2-3 students.\*\*\*

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## EQ4032 - EQUESTRIAN SKILL ANALYSIS

ECTS Credits: 6 (Year 1 Module)

### Biological Sciences

**Rationale and Purpose of the Module:** *This module provides important foundation skills for students of equitation in movement and technique analysis,*

necessary for evaluating equines as athletes. Students are provided with the knowledge and skills to evaluate the physical interactions between the horse and rider.

**Syllabus:** Common misconceptions in rider skill requirements. Rider movement; the role of nervous, skeletal and muscular systems in proprioception and movement, use of body segments for balance and to influence the horse, core stability, skill related components of fitness, physiology and psychology of motor learning, limiting factors - joint range of movement, mental fitness and physical fitness. Qualitative analysis of rider movement, variations by sports discipline. Analysis of technique, strategies and rules of the 3 main Olympic equestrian disciplines and horse racing. Use of video analysis of, and feedback on rider performance. Analysis of efficient technique and its role in influencing the horse and avoiding injury. Simple methods for developing rider and horse skills; use of simple off and on horse techniques on the flat, over ground poles and jumping to promote efficiency, rhythm, balance, coordination and accuracy in rider and horse movement. Developing skills and knowledge on bandaging, biting, early handling of horses and corrective and surgical shoeing. Factors affecting rider movement; tack and equipment, horse and rider conformation, rider gender, length of stirrup and saddle design.

#### **EV4042 - EQUINE REPRODUCTION**

*ECTS Credits: 6 (Year 1 Module)*

#### **Biological Sciences**

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

**Syllabus:** The syllabus is comprised of the following: reproductive anatomy of the mare and stallion, reproductive endocrinology of the mare and stallion, oestrous cycle, fertilization, pregnancy, parturition; neonatal physiology; male reproductive physiology and practical aspects of equine breeding management. The management of brood mares and stallions are presented from a physiological and husbandry perspective. The events at parturition are presented and discussed in the context of the management of the neonatal foal and the

early return of the mare to reproductive activity.

## **Biological Sciences Year 2 Modules**

### **BY4008 - GENETICS AND MOLECULAR BIOLOGY**

*ECTS Credits: 6 (Year 2 and 4 Module)*

#### **Biological Sciences**

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

**Syllabus:** Extensions of Mendelian genetics - incomplete dominance and codominance, pleiotropy. Linkage; multiple alleles, multiple genes and epistasis. Quantitative characters, genetic variance and heritability. Basic laws of probability and inheritance of characters. Basic principles of plant and animal breeding. Human genetics. Introduction to population genetics. Speciation and evolution. DNA and chromosome structure and packaging. DNA replication, transcription, translation and the genetic code. Mutation causes and effects at the gene chromosome and organism levels. Recombinant DNA/RNA technology. Genomics. Proteomics. Regulation of gene expression in prokaryotes and eukaryotes; genes and cancer, cell differentiation. Bacterial and viral genetics.

**Prerequisites:** BY4002, BY4006

**\*\*\*Lab numbers are capped at 2-3 students.\*\*\***

### **BY4014 - MICROBIOLOGY AND IMMUNOLOGY**

*ECTS Credits: 6 (Year 2 Module)*

#### **Biological Sciences**

**Rationale and Purpose of the Module:** *This module provides an introduction to Microbiology and Immunology. Students are introduced to the concepts of microbes as mutualists, commensals and pathogens. The module serves to introduce students to the nature of the host pathogen relationship and how the innate and adaptive immune system maintain host defences.*

**Syllabus:** Microbiology: introduction to micro-organisms; major structural components of bacteria; mutualism, indigenous microbiota; determinants of virulence; Pathogen-associated molecular patterns; Virology: virus structure and classification; viral pathogenesis, viral interactions and immune evasion. Immunity: introduction to immunity; innate defences against infection; pattern recognition receptors; cell biology of the specific immune system; humoral specific immunity; cell mediated specific immunity; generation of immunological diversity.

**\*\*\*Lab numbers are capped at 2-3 students.\*\*\***

### **BY4104 - ECOLOGY 1**

*ECTS Credits: 6 (Year 2 Module)*

#### **Biological Sciences**

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

**Prerequisites:** BY4001, BY4002, BY4003

\*\*\*Lab numbers are capped at 2-3 students.\*\*\*

#### **EQ4014 - FOUNDATIONS OF EQUINE PERFORMANCE**

ECTS Credits: 6 (Year 2 Module)

##### **Biological Sciences**

Horse handling and management; methods of control and restraint, protocols for assessing and monitoring horse health, welfare status and fitness for use, use of lunging on hard and soft surfaces and as an evaluation tool for lameness and respiratory assessment. Measuring physiological indicators; respiration, temperature, heart rate, hydration. Assessment and selection for performance; genotypic and phenotypic considerations, environmental and training contributions, cloning the sports horse, sales evaluation. Training; identification of efficient athletic technique, exercises to improve athletic performance, improving accuracy and power in athletic technique in the horse, use of jumping exercises to improve power and agility, establishing independent balance in the horse and rider.

#### **EV4013 - EQUINE PHYSIOLOGY**

ECTS Credits: 6 (Year 2 Module)

##### **Biological Sciences**

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

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

Prerequisites: BY4002, EV4012, BC4902, BY4001

\*\*\*Lab numbers are capped at 2-3 students.\*\*\*

#### **EV4014 - EQUINE NUTRITION**

ECTS Credits: 6 (Year 2 Module)

##### **Biological Sciences**

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

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

\*\*\*Lab numbers are capped at 2-3 students.\*\*\*

#### **EV4015 - EQUINE HEALTH AND DISEASE**

ECTS Credits: 6 (Year 2 Module)

##### **Biological Sciences**

**Rationale and Purpose of the Module:** To acquaint students with the physical appearance and behaviour of the healthy horse so that signs of ill health and disease

are recognised at an early stage, thus enabling them to make informed decisions about the necessity for veterinary intervention.

To acquaint students with disease conditions of toxicologic origin and with the causes, management and prevention of infectious diseases.

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

\*\*\*Lab numbers are capped at 2-3 students.\*\*\*

#### **FT4204 - FOOD CHEMISTRY**

ECTS Credits: 6 (Year 2 Module)

##### **Biological Sciences**

**Rationale and Purpose of the Module:** To introduce students to the utilisation of raw materials by the food industry

To provide a general course on the chemistry of raw materials and of foods

**Syllabus:** Overview of utilisation of plant and animal raw materials by agri-industries. Biochemistry of raw materials - amounts and types of proteins, lipids, carbohydrates and secondary metabolites of economic importance. Anatomical and structural aspects of raw materials. Food Analysis. Relationship between raw material composition and biochemical and physical properties.

\*\*\*Lab numbers are capped at 2-3 students.\*\*\*

**FT4214 - PUBLIC HEALTH NUTRITION***ECTS Credits: 6 (Year 2 Module)***Biological Sciences**

**Rationale and Purpose of the Module:** This module provides the necessary understanding, knowledge and skills to allow students undertake more advanced learning in nutrition in subsequent semesters. Public Health Nutrition will focus on population-based epidemiological evidence linking diet and disease and explore interactions between nutrition, genetics and lifestyle. Specific topics of issue to public health including obesity, type II diabetes, heart disease, specific micronutrient deficiencies, dental health, osteoporosis, cancer and immunity will be discussed. The role of national and international regulatory agencies (including the World Health Organisation, Food Safety Authority of Ireland, Food Safety Promotion Board, European Food Safety Agency) will be examined in terms of safe guarding population public health. The purpose of this module is to: a). To provide an overview of the role of nutrition as a major factor in the aetiology of chronic disease of relevance to public health b). To examine the role of diet in treatment and prevention of a range of chronic disease c). Explore a number of emerging diet-related public health issues. The most relevant and up-to-date literature will be used and referenced to provide the best evidence base for this module content.

**Syllabus:** Overview of public health nutrition from an epidemiological perspective and strategies to tackle major, population-based public health issues including ecological public health strategies . 2. Examine the role of diet in selected chronic disease of public health concern including obesity, type II diabetes, heart disease, specific nutritional deficiencies, dental health, osteoporosis, cancer and immunity. 3. Discuss the role of media / regulatory bodies / food industry / society / culture on major public health issues. 4. Other factors (environmental, psychological) influencing consumer food and lifestyle choice and attitudes surrounding preference will also be explored. 5. Examine the role of national and international regulatory agencies in ensuring consumer public health including; World Health Organisation, Food Safety Authority of Ireland, Food Safety Promotion Board, European Food Safety Agency.

**Prerequisites:** BY4214**Biological Sciences Year 3 Modules****BY4016 - ANIMAL PRODUCTION SYSTEMS***ECTS Credits: 6 (Year 3)***Biological Sciences**

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

**Syllabus:** - Animal Welfare

- Five freedoms of animal welfare, Animal Welfare Law; principles of animal welfare; body condition scoring of cattle, sheep and pigs; major categories of animal diseases; zoonotic and notifiable diseases.
- Sheep Flock Management
  - o Sheep production systems; sheep breeds; sheep breeding; rearing and feeding of sheep and lambs; sheep diseases; building and handling facilities for sheep.
- Beef Herd Management
  - Breeds of beef cattle; rearing and production of steer, heifer and bull beef; feeding of beef cattle; carcass grading systems for beef cattle; diseases of beef cattle; housing and handling facilities for beef cattle.
  - Dairy Herd Management
    - Breeds of dairy cattle; spring and autumn calving dairy herds; life cycle of a dairy cow; the lactation curve; diseases of dairy cows; rearing of dairy calves; feeding of dairy cows; milking machine and milking parlour operation; housing and handling facilities for dairy cows.
- Pig Production
  - o Breeds of pigs; the pig production cycle; diseases of pigs; feeding of pigs.
- Poultry Production
  - Poultry management of production of meat and eggs; poultry housing.

**Prerequisites:** BY4025**\*\*\*Lab numbers are capped at 2-3 students.\*\*\*****BY4026 - HORTICULTURE***ECTS Credits: 6 (Year 3)***Biological Sciences**

**Rationale and Purpose of the Module:** The purpose of the module is to familiarize students of the Biological Sciences (LM092) who are taking the Agricultural Science elective, with the principles and practices of Horticultural science.

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

**Prerequisites:** BY4015**\*\*\*Lab numbers are capped at 2-3 students.\*\*\*****Biological Sciences Year 4 Modules****BY4505 - POLLUTION BIOLOGY***ECTS Credits: 6 (Year 4 Module)***Biological Sciences**

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

**Syllabus:** Categories of freshwater pollution. Organic pollution of surface and ground water - sources, effects and impacts. Indicators - biological and chemical monitoring; use of biotic indices. Methods for determination of nitrates, phosphorus , chlorophyll a, Ca, Mg, D.O., B.O.D., C.O.D., T.O.C., etc. Microbial pollution - methods. Toxic pollutants in air, water, soil and food. Introduction to toxicological principles: acute toxicity; LD50; chronic toxicity (types of). Uses of lab and epidemiological studies. Introduction to structure activity relationships in toxic chemicals. Risk assessment. Analytical methods. Review of toxic effects of heavy metals, chlorinated

hydrocarbons and other organics and inorganics, mycotoxins, radioactive elements. Air pollution: major air pollutants, sources and impacts, i.e. smoke SO<sub>2</sub>, NO<sub>x</sub>, PAHS CO<sub>2</sub> Ozone, volatile organics CFC's. Global warming auses, models and scenarios; biological impacts.

**Prerequisites:** BY4003

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#### **EQ4038 - TRAINING THE PERFORMANCE HORSE**

*ECTS Credits: 6 (Year 4 Module)*

##### **Biological Sciences**

Developmental exercises; leg yield, shoulder in, travers, renvers, half pass, sequence bounces, stride adjustment and distance tests, showjumping and dressage exercises for the racehorse, maintaining willingness in the horse in high level training. Analysis of performance requirements; rules of sports and racing disciplines, test definitions and influence on training and outcome, development, implementation and evaluation of training plans for technique and fitness, long term equine development models, comparison of Irish and international horse development and assessment models. Equipment and technology; use of pressure measurement devices to evaluate saddle fitting, use of 2D motion analysis of technique and movement on the flat and over fences.

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#### **EQ4048 - MANAGING THE PERFORMANCE HORSE**

*ECTS Credits: 6 (Year 4 Module)*

##### **Biological Sciences**

Performance environments; heat and humidity, acclimatisation, replication, aggressive cooling, rehydration and pre-hydration. Ethics; use in competition, safety, rules and regulations, fence and course design. Holistic management; roles and values of the contributing practitioners. Competition planning; periodisation, setting long medium and short term goals, training schedules, licenses and qualifications, entries,

travel, quarantine, management at competitions, recovery from competition. Profiling; conformation, back templating, weighing, limb examination, routine health observations, value of veterinary imaging techniques. Procedures; travel documentation, routine health care, vaccinations, licenses, entries, competition analysis and planning.

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#### **EQ4068 - ADVANCED EQUINE PHYSIOLOGY**

*ECTS Credits: 6 (Year 4 Module)*

##### **Biological Sciences**

**Rationale and Purpose of the Module:** *This module is focused on the core principles and recent developments in Exercise and Reproductive Physiology. It aims to provide students with an understanding of both of these facets of physiology so as to equip students to work in the equine industry.*

**Syllabus:** Effect of exercise and training on the cardiovascular, respiratory, nervous, and musculoskeletal systems. Sources of energy and the causes of fatigue in horses undertaking different types of work. Modern training methods relating the principles of exercise physiology with current training and management regimes. Laboratory and field methods for monitoring equine fitness based on heart rate, respiratory rate, oxygen consumption and blood lactate production. Examination of fitness training programmes for horses competing in specific disciplines. Interval training, continuous training. Recent developments in assisted reproductive technologies in horses including manipulation of the mares reproductive cycle. Assessment of follicular dynamics using ultrasonography, Multiple ovulation and embryo transfer, Semen collection, processing and freezing, Sperm assessment techniques, Artificial insemination, Cloning.

**Prerequisites:** EV4013

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#### **EV4017 - EQUINE PHARMACOLOGY**

*ECTS Credits: 6 (Year 4 Module)*

##### **Biological Sciences**

**Rationale and Purpose of the Module:** *To acquaint*

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

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

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#### **FT4428 - ADVANCED FOOD CHEMISTRY**

*ECTS Credits: 6 (Year 4 Module)*

##### **Biological Sciences**

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

**Syllabus:** Detailed treatment of the chemistry of lipids, carbohydrates and proteins in food systems. Analytical techniques. Relationships between structure and function. Industrial modification of lipids; oxidative rancidity and its control. Emulsification. Non-enzymatic browning and caramelisation reactions. Natural and chemically modified polysaccharides. Roles of proteins in gelation, dough formation, foaming, texture formation, etc. Effects of processing and storage.

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**FT4438 - FOOD MICROBIOLOGY**

ECTS Credits: 3 (Year 4 Module)

**Biological Sciences**

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

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

**FT4458 - FOOD PRODUCTION SYSTEMS**

ECTS Credits: 3 (Year 4 Module)

**Biological Sciences**

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

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

**FT4468 - FOOD BIOTECHNOLOGY**

ECTS Credits: 6 (Year 4 Module)

**Biological Sciences**

**Rationale and Purpose of the Module:** To introduce students to the basic concepts of Food Biotechnology. To develop an understanding of the enabling technologies used to manipulate micro-organisms, plants and animals for the production of food. To develop a critical awareness of the impact of Food Biotechnology on the production and processing of food. To develop a critical awareness of the impact of Food Biotechnology on the ethics, labelling and regulatory issues related to the consumer and the environment

**Syllabus:** Introduction to Food Biotechnology, Outline of basis of traditional and novel food biotechnology processes; principles of fermentation, separations, recovery systems; Introduction to novel platform technologies; Genomics, Proteomics, Bioinformatics. Biotechnology and the food industry: Enzyme and bacterial mediated bio-transformations; Flavour Ingredients, Brewing, Winemaking, Enzyme technology. Food applications of microbial biotechnology; Lactic acid bacteria and Yeast; metabolic and protein engineering, overexpression of enzymes and metabolic end products; Probiotics and nutrigenetics. Plant Biotechnology; Plant transformations, genetic strategies for improvements of characteristics, pesticide resistance, yield improvement, metabolite production. Animal Biotechnology; Genetic strategies for improvements of animal characteristics, disease resistance, yield and performance improvement, Transgenic animals, Quantitative trait loci (QTLs) Related issues; Regulations and Legal declarations, Ethics, Consumer concerns, biotechnology and the environment, Future trends

Prerequisites: BC4904, BC4803

\*\*\*Lab numbers are capped at 2-3 students.\*\*\*

## Department of Chemical Sciences Year 1 Modules

**BC4002 - INTRODUCTORY BIOCHEMISTRY**

ECTS Credits: 6 (Year 1 Module)

**Chemical Sciences**

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

\* To provide an understanding of the principles of metabolism

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

**Syllabus:** The structure and biological function of proteins: Amino acids, peptides and the peptide bond. Polypeptides. Overview of protein function; catalysis, transport, structural, regulatory and defence functions. Case study; structure and function of muscle proteins; myosin, actin and muscle contraction. The structure and biological functions of carbohydrates: Monosaccharides, disaccharides, polysaccharides. Storage and structural functions. The structure and biological functions of lipids: Fatty acids. Storage and structural lipids. Biological membranes. Nucleic acids: DNA and RNA. Genome structure. Transcription and gene regulation. Translation. Basic metabolic principles; metabolic pathways, catabolism versus anabolism. Overview of stage I, II and III catabolic pathways. Summary overview of carbohydrate catabolism; glycolysis and the TCA cycle. The generation and uses of ATP; oxidative phosphorylation and electron transport. The biochemistry of blood: Blood; composition and major functions. Haemoglobin and gas transport. Blood and pH regulation. Introductory immunology: Humoral immunity; antigens and antibodies. Cellular immunity. Cytokine based regulation of immune function.

**CH4002 - PHYSICAL CHEMISTRY 1**

ECTS Credits: 6 (Year 1 Module)

**Chemical Sciences**

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

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

iii. To introduce the students to the basic chemical kinetics including the quantitative expressing of the rate

of chemical reactions and key kinetic parameters in the chemical kinetics

**Syllabus:** [Introduction to Chemical Thermodynamics; Heat; Work; Reversible and Irreversible Systems; State functions.]  
 [First Law of Thermodynamics; Internal Energy; Enthalpy; Standard Enthalpies.]  
 [Second and Third Laws of Thermodynamics; Entropy, Clausius Inequality; Gibbs and Helmholtz Free Energies.]  
 [Chemical Equilibrium; variations with temperature and pressure.]  
 [Introduction to Chemical kinetics; Zero, First and Second Order Rate Laws. Activation Energy and the Arrhenius Equation; Accounting for the Rate Laws; Reaction Mechanisms; Steady State Approximation. Michaelis-Menten equation]

#### CH4102 - ORGANIC CHEMISTRY 1

ECTS Credits: 6 (Year 1 Module)

#### Chemical Sciences

**Rationale and Purpose of the Module:** To impart to the student an understanding of, an enthusiasm for, and a basic working knowledge of organic functional group chemistry.

**Syllabus:** Alkanes, cycloalkanes, alkenes, alkynes: structural formulae; shape and bonding; nomenclature; isomerism; conformational analysis; free radical and ionic reactions; mechanism of reactions; electrophilic addition; primary, secondary and tertiary carbonium ions.  
 Haloalkanes: nomenclature; substitution and elimination reactions; mechanism of reactions – SN1, SN2, E1, E2. Alcohols, ethers and epoxides: methods of preparation; typical reactions.  
 Aldehydes and ketones (part 1): methods of preparation; typical reactions - nucleophilic addition, Grignard reaction as a carbon-based nucleophile; keto-enol tautomerism and reaction (bromination) at the α-position.

Prerequisites: CH4102

#### CH4252 - INORGANIC CHEMISTRY 1B

ECTS Credits: 6 (Year 1 Module)

#### Chemical Sciences

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

**Syllabus:** Binding in simple covalent molecules: Lewis structures, molecular shape using VSEPR theory; polarity in molecules. Atomic and molecular orbitals; energy level diagrams and molecular orbitals diagrams for diatomic molecules. Bonding in transition metal complexes: crystal field theory and the colour, magnetism and thermodynamic properties of transition metal compounds. Bonding in solids: types of bonding and factors affecting the strength of bonding. Unit cells. Close-packing in metals. Close-packing in understanding ionic structures; radius ratio; lattice energy.

Prerequisites: CH4701

#### ER4606 - CLEAN TECHNOLOGY

ECTS Credits: 6 (Year 1 Module)

#### Chemical Sciences

**Rationale and Purpose of the Module:** To provide an introduction to the concept of clean technology. To survey methods of recycling, reducing or removing gaseous or aqueous waste from industrial processes using a clean technology approach.

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

## Department of Chemical Sciences Year 2 Modules

#### BC4904 - PROTEINS AND DNA

ECTS Credits: 6 (Year 2 Module)

#### Chemical Sciences

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

**Syllabus:** The structure of DNA and other nucleic acids. The molecular concept of a gene.. DNA sequencing. The central dogma - DNA makes RNA makes Protein. Processing of DNA - Replication, transcription and translation. The relationship between DNA and Protein – the genetic code. Eukaryotic and prokaryotic systems. Control sites and elements within DNA. Gene expression – the lac operon. Review of Protein structure, amino acids peptides primary, secondary and tertiary structure of proteins. 3D structures and their representation. Functionality of proteins, Strategies of protein purification and assay. Protein sequencing and analysis. Enzymology, the nature of enzymes, their classification and activities. Enzyme kinetics and catalysis, enzyme inhibitors. Mode of action of enzymes -lysozyme on peptidoglycan.

Prerequisites: BC4903

#### CH4004 - PHYSICAL CHEMISTRY 3

ECTS Credits: 6 (Year 2 Module)

#### Chemical Sciences

**Rationale and Purpose of the Module:** i. To facilitate students in understanding the fundamental thermodynamic laws and functions that rule a process of change in a physical chemical system.  
 ii. To provide students with requisite knowledge of analysing physical chemical systems, such as the phase transformation of a pure substance, the mixing and phase transformation of two components, using thermodynamic and derived thermodynamic functions.  
 iii. To familiarise the students with the phase diagrams and the use of these to analyse the above-mentioned physical chemical system.  
 iv. To provide the students with basic knowledge of electrochemistry, electrochemical cell and their thermodynamic account.

**Syllabus:** - 1st Law of Thermodynamics; Enthalpy  
 - Entropy; 2nd and 3rd Laws of Thermodynamics;  
 Clausius Inequality  
 - Helmholtz and Gibbs Energies  
 - Chemical Potential; Fundamental Equation of Chemical Thermodynamics  
 - Physical Transformations of Pure Substances: Phase Diagrams; Phase Stability and Phase Transitions; The Physics of Liquid Surface  
 - Simple Mixtures: Gibbs-Duhem equation; Raoult's and Henry's Laws  
 - Phase Diagrams: Phase Rule; Two-Component Systems  
 - Equilibrium Electrochemistry: Thermodynamic Properties of Ions in Solution; Electrochemical Cells; Nernst Equation

Prerequisites: CH4003, CH4002

#### CH4104 - ORGANIC CHEMISTRY 3

ECTS Credits: 6 (Year 2 Module)

##### Chemical Sciences

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

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

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

structure; reducing and non-reducing disaccharides. Polysaccharides: structure and occurrence.

##### Heterocyclic Chemistry:

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

Prerequisites: CH4103, CH4102

#### CH4304 - ANALYTICAL CHEMISTRY 2

ECTS Credits: 6 (Year 2 Module)

##### Chemical Sciences

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

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

Prerequisites: CH4303

#### CH4354 - ANALYTICAL CHEMISTRY FOR THE ENVIRONMENT

ECTS Credits: 6 (Year 2 Module)

##### Chemical Sciences

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

##### Syllabus: SYLLABUS

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

##### CHROMATOGRAPHIC METHODS:

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

##### ELECTROMETRIC METHODS:

POTENTIOMETRIC (PH, ISE)  
 CONDUCTOMETRIC

#### CH4404 - PROCESS TECHNOLOGY 1

ECTS Credits: 6 (Year 2 Module)

##### Chemical Sciences

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

**Syllabus:** Health and safety at work: types of factory environment and their physiological and psychological risks. Current legislation in the area of employer and employee liability. Codes of practice. The role of management and unions in safety.

Introduction to process control: basic control modes e.g. P, PI, PID; control system architecture and dynamic behaviour for SISO processes; controller tuning; control system hierarchies for chemical/biochemical processing plants.

Equipment and instrumentation used in chemical and biochemical processing operations: sensing and measurement; signal transmission; controllers; final

control elements.

Process modelling; application of material and energy balances in the formulation of quantitative process models; process characteristics and dynamic response behaviour of first and second order systems.

#### **CH4554 - ENVIRONMENTAL CHEMISTRY**

*ECTS Credits: 6 (Year 2 Module)*

##### **Chemical Sciences**

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

**Syllabus:** Chemistry of the earth: overall structure, composition, energy flow, inter-relation of the different spheres. Definitions. Concentrations.

The hydrosphere: composition; the water cycle; equilibria in aqueous systems, distribution diagrams; water pollution.

The lithosphere: composition and structure; weathering; leaching and soil chemistry; mineral resources and pollution; geochemistry; solubility, pH; E-pH diagrams.

The atmosphere: composition, chemical processes in the atmosphere, solubility in water; chemistry of acid deposition, greenhouse effect, ozone depletion, photochemical smog.

The biosphere: composition, major and minor elements; sources, utilisation and disposal; toxicology of heavy metals and organics, bioaccumulation.

Biogeochemical cycles for nitrogen, carbon, sulphur, phosphorus, etc

*Prerequisites: CH4253, CH4252, CH4701*

## **Department of Chemical Sciences Year 3 Modules**

#### **BC4705 - INDUSTRIAL BIOCHEMISTRY 1**

*ECTS Credits: 6 (Year 3 Module)*

##### **Chemical Sciences**

**Rationale and Purpose of the Module:** *To present an overview of major practical aspects of pharmaceutical manufacture, quality systems and pertinent environmental regulation. To present an overview of industrial enzymes/proteins and their uses. To facilitate critical analysis of issues/topics pertaining to these themes and to provide scope for a measure of student self-directed learning.*

**Syllabus:** Practical Aspects of Pharmaceutical Manufacture: International Pharmacopoeia. GMP in the Pharmaceutical Industry. The Pharmaceutical Facility; Clean Rooms, Cleaning Decontamination and Sanitation. Generation of Water for Pharmaceutical/Biopharmaceutical Processing. Product Flow Through the Facility and Associated Documentation. The ISO series of quality standards. Laboratory accreditation. Validation of methodology and industrial processes in biotechnology. Environment and Industry, the Environmental Protection Agency (EPA) and IPPC Licensing for biotechnology. Industrial enzymes and proteins; range, applications and selected case studies. Stabilizing proteins for industrial use.

*Prerequisites: BC4903, BC4803*

## **Department of Chemical Sciences Year 4 Modules**

#### **BC4008 - IMMUNO AND DNA DIAGNOSTIC TECHNIQUES**

*ECTS Credits: 6 (Year 4 Module)*

##### **Chemical Sciences**

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

**Syllabus:** Overview of the immune system. Development and diversity of the system. Cellular and humoral responses. Passive vs. active immunity, vaccination. Complement system. T cell structure and

differentiation. Memory.

Antibody structure and function. Polyclonal vs. monoclonal

Bacterial, insect and eukaryotic expression system used for protein production, especially those applied for antibodies production.

Crystallisation of proteins.

Usage of monoclonal antibodies for membrane proteins crystallisation.

Introduction to crystal structure determination.

Interpretation of 3D structure of antibodies.

Immuno- and nucleic acids diagnostics (diagnosis for infectious and genetic diseases), for instance PCR and PCR variants, Real-time PCR, RAPDs, RFLPs, DNA profiling and DNA fingerprinting.

#### **BC4718 - INDUSTRIAL BIOCHEMISTRY 2**

*ECTS Credits: 6 (Year 4 Module)*

##### **Chemical Sciences**

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

*To present an overview of patenting as applied to biotechnology.*

*To provide the scope for a measure of student self-directed learning and problem-based learning.*

**Syllabus:** Animal cell culture; Overview and introduction to animal cell culture. Animal cell culture, media, methods and apparatus. Animal cell culture; production of industrially useful products. The drug development process; Regulatory route for new drugs in USA & EU. Biopharmaceutical manufacture; Patenting and biotechnology. Principles of patentability. The patent application process. Sources of biopharmaceuticals. Upstream processing. Downstream processing. Post translational modifications and their significance. Product QC and the range and significance of potential product impurities. Nucleic acid-based biopharmaceuticals; The theory underpinning gene therapy, antisense based products and aptamers.

Specific biopharmaceuticals; Students will be provided with 2-3 specific biopharmaceutical products/product families, along with bibliographic details of at least 1 reference source material for each. Students will be expected to source the references, along with any additional pertinent references and undertake self-directed study of the biochemistry and biotechnology of the representative biopharmaceuticals.

**Prerequisites:** BC4904, BC4905, BC4903

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### **BC4907 - CELL BIOCHEMISTRY**

*ECTS Credits: 6 (Year 4 Module)*

#### **Chemical Sciences**

**Rationale and Purpose of the Module:** *To introduce current advanced topics in cell and molecular biology and utilise these to probe modes of intervention in developing targeted approaches to future diagnoses, pharmaceuticals and biopharmaceuticals. To show how an in-depth understanding of molecular biochemistry can aid this.*

**Syllabus:** Review of cell structure, organisation and the concept of signalling and trafficking. Signal transduction and cell communication. Cell signalling pathways. Receptor biochemistry in cell signalling- Oncogenes and the molecular basis of cancer and its relationship to cell signalling. Apoptosis and programmed cell death. The eukaryotic chromosome- structure and the nature of eukaryotic DNA. Repetitive DNA. Control of transcription in eukaryotes. The transcription machinery and role of eukaryotic transcription factors. Splicing in eukaryotes. Microarrays to examine gene expression. Posttranslational modification of proteins. Protein folding, protein targeting via glycosylation, protein transport and destruction. Pharmacological interventions in cell signalling. RNA interference.

**Prerequisites:** BC4905, BC4905

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### **CG4008 - PROCESS TROUBLESHOOTING**

*ECTS Credits: 6 (Year 4 Module)*

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#### **Chemical Sciences**

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

*To provide the students with a working knowledge of a commercial Computational Fluid Dynamics code via practical computer laboratory sessions.*

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

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

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

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

Process trouble shooting simulation lab.

Conservation equations for mass, momentum and energy; Finite-volume method for stirring reactor problems; Construction of geometry, grid generation techniques and discretization using commercial Computational Fluid Dynamics (CFD) solvers; Turbulence modelling; Implementation of boundary conditions.

**Prerequisites:** CH4405, CH4415

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### **CH4008 - ORGANIC PHARMACEUTICAL CHEMISTRY**

**2**

*ECTS Credits: 6 (Year 4 Module)*

#### **Chemical Sciences**

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

*comprehension and working knowledge of functional group chemistry; to expand the range of reagents, reactions and associated mechanisms; to detail how structure and reactivity can be quantitatively correlated; to detail quantitative aspects of acid and base catalysis.*

**Syllabus:** Section A: Regiochemical control: addition of HBr by ionic and radical mechanisms, alcohol formation by acid catalysed hydration and via hydroboration; Chemoselective control: Lindlar catalyst and dissolving metal reduction; hydride reducing reagents, Reformatsky reaction; use of protecting groups. Stereochemical control: asymmetric induction, diastereomeric selectivity, Felkin-Anh model; enantiomeric selectivity, chiral hydride reagents (Alpine Borane and Alpine Borohydrides), chiral catalysts -Monsanto catalyst for L-Dopa production. Section B: Quantitative structure activity relationships: development and use of the Hammett equation; definition of general and specific acid and base catalysis, use of buffers and kinetic data to distinguish between general and specific catalysis, quantitative analysis of data.

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

**Prerequisites:** CH4008

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### **CH4017 - CHEMICAL NANOTECHNOLOGY**

*ECTS Credits: 6 (Year 4 Module)*

#### **Chemical Sciences**

**Rationale and Purpose of the Module:** *The Chemical Nanotechnology module will &bull;Provide the student with a broad understanding of the principles that underpin nanoscience and nanotechnology.*

*&bull;To acquaint the student with synthetic methods for formation of nanostructures and new physical properties that arise.*

*&bull;To enable the student to solve problems relating to size dependent physical, optical and electrical properties*

at the nanoscale.

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

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#### CH4027 - NANOTECHNOLOGY ECTS Credits: 6 (Year 4 Module)

##### Chemical Sciences

**Rationale and Purpose of the Module:** To provide a specialist module in nanotechnology.  
The Nanotechnology module will &bull; Provide the student with a broad understanding of the physical and chemical principles that underpin nanoscience and nanotechnology.  
&bull; Acquaint the student with synthetic methods for formation of nanostructures and new physical properties that arise.  
&bull; Enable the student to solve problems relating to size dependent physical, optical and electrical properties at the nanoscale.

**Syllabus:** Course will cover: (1) Chemical and physical properties as length scales vary from the macroscale through microscale to the nanoscale. (2) Study of fundamental properties of nanomaterials such as carbon nanotubes and nanoparticles in terms of geometries, tensile strength, and electronic properties (3) Functionalisation of inorganic nanostuctures with organic molecules and the bio/nano interface (4) Molecular driving forces including quantum interactions and molecular dynamics (5) Application to design and

synthesis of advanced materials for renewable energy, medical diagnostics, and food production.

*Prerequisites: CH4701, BY4001, CH4252, PH4131, PH4102*

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#### CH4306 - ANALYTICAL CHEMISTRY 4

*ECTS Credits: 6 (Year 4 Module)*

##### Chemical Sciences

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

**Syllabus:** Mass Spectrometry: Brief review of some basic principals; Fragmentation Patterns; Rearrangements; Interpretation of spectra; Hyphenated techniques.

NMR Spectroscopy:  
1-D 1H NMR: Review of some basic principals; Relaxation Processes; Homotopic, enantiotopic and diastereotopic systems; Nuclear Overhauser Effect (NOE); Second-Order Spectral Interpretation.  
13C NMR: Theory; DEPT 13C nmr; NOE, Quantitative 13C nmr; Interpretation of spectra.  
Solid State 13C nmr (brief).  
2-D 1H NMR: COSY (1H-1H connectivity); NOESY, ROESY (through space 1H-1H proximity), HOSEY; HECTOR (1H - 13C connectivity); INADEQUATE (13C - 13C connectivity); TOCSY (1D and 2D); Interpretation of spectra.

Structure elucidation using combined spectroscopic techniques (of those above).

Laser Raman Spectroscopy:  
Theory; Comparison with FT-IR spectroscopy; Spectral

interpretation of simple organic molecules and carbon allotropes (diamond, graphite and carbon nanotubes).

Problem Sessions/Lab.

*Prerequisites: CH4305, CH4304, CH4303*

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#### CH4608 - PLANT AND PROCESS MANAGEMENT 2

*ECTS Credits: 6 (Year 4 Module)*

##### Chemical Sciences

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

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

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

Plant location and layout: principles and application.

Environmental impact assessment of chemical and biochemical production facilities.

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

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#### ER4508 - POLLUTION CONTROL 2 (WASTE MANAGEMENT)

*ECTS Credits: 6 (Year 4 Module)*

##### Chemical Sciences

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

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

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

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

**Syllabus:** [Waste Minimisation]. [Hazardous Waste Management]. [Waste to energy systems]: Incineration, landfill; composting. Dust collection devices (cyclones, ESP, baghouses, scrubbers). Leachate control and gas capture. [Waste recycling ]techniques and economics. [Re-use] of waste materials.

## Department of Computer Science & Information Systems Year 1 Modules

### CS4072 - MEDIA PROGRAMMING 2

ECTS Credits: 6 (Year 1 Module)

#### Computer Science & Information Systems

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

**Syllabus:** - Vector and bitmapped image formats;  
- Drawing simple shapes and drawing text on existing images;  
- How we digitize/encode sounds; Nyquist theorem;  
manipulating samples;  
- Using iteration and selection constructs to

increase/decrease sound, normalizing sound;  
- Creating sound clips, splicing sound, reversing and mirroring sound;  
- Composing and blending sounds;  
- Encoding, manipulating and creating movies;  
- Reading from and writing to text files; string manipulation;

Prerequisites: CS4061

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### CS4082 - INTRODUCTION TO WEB DEVELOPMENT

ECTS Credits: 6 (Year 1 Module)

#### Computer Science & Information Systems

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

**Syllabus:** Introduction to the world wide web: web browsers, web servers and clients, uniform resource locators, the hypertext transfer protocol (HTTP), processing HTTP requests and responses, world wide web consortium (W3C), static and dynamic content. Document content and structure, mark-up languages, elements and attributes, document type definition (DTD), hypertext and hypermedia. Hypertext MarkUp Language (HTML); standard HTML document structure, HTML syntax, tags, text formatting, colours, images, hypertext links, absolute and relative referencing, list, tables, frames and forms. Considerations when including audio, video and graphics; differentiating between file formats. Embedding PHP in HTML; assigning and using variable values, saving form input in variables, simple data types, detecting the data type of a variable, using operators: arithmetic, relational, logical; string operators, auto increment/decrement operators, operator precedence; selection and looping constructs. Sessions and cookies: creating a session and registering session variables, destroying a session; setting cookies, retrieving cookie data, deleting cookies. File manipulation: reading data from and writing data to files. Introduction to relational databases: tables, records,

fields, primary keys and foreign keys. Introduction to Structured Query Language (SQL); creating tables: specifying field data types, retrieving, inserting, editing and deleting records. Connecting to a database in PHP and executing SQL commands.

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### CS4232 - MUSIC AND COMPUTERS

ECTS Credits: 6 (Year 1 Module)

#### Computer Science & Information Systems

**Rationale and Purpose of the Module:** Students will develop their knowledge and competence of digital media systems through the use of specialised software. (Existing module CS4021 "Digital Media Software & Systems 1" is part of a suite of module core to 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: Audio

Controlling the timeline.  
Introduction to sequencing.  
Implementation of trackers, sequence layering & looping.  
The MIDI protocol, interface and its implications.  
Approaches in sequencing software (trackers, workstations, notation software, live sequencing).  
Approaches to software and hardware interface design.

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## Department of Computer Science & Information Systems Year 2 Modules

### CS4029 - ADVANCED AUDIO PRODUCTION

ECTS Credits: 6 (Year 2 Module)

#### Computer Science & Information Systems

**Rationale and Purpose of the Module:** To give the student an in-depth understanding of the techniques for recording, processing and dissemination of audio; To

give the student an understanding of audio processing on both the temporal, spatial and spectral domain.

**Syllabus:** 1. Advanced Microphone Techniques (Binaural, MS pair, XY, ORTF)  
 2. Principles of audio reinforcement systems. Advanced use of Compressor, Multiband, Compressors and audio effects in general.  
 3. Analysis of PA systems for public events  
 4. Surround sound mixing techniques and implementation.  
 5. Time code and synchronization (SMPTE, MTM) with video software and/or hardware.

*Prerequisites:* CS4025

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#### **CS4084 - MOBILE APPLICATION DEVELOPMENT**

*ECTS Credits:* 6 (Year 2 Module)

##### **Computer Science & Information Systems**

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

**Syllabus:** Challenges to be faced when developing applications for mobile devices.  
 Platform specific mobile applications and/or mobile web applications; mobile application lifecycles.  
 Mobile applications and their architectures.  
 Overview of operating systems (OSs) and Application Programming Interfaces (APIs) to choose from when developing applications for mobile devices.  
 Comparison of native development environment options; software development kits (SDKs) and emulators.  
 Installing and configuring the development environment.  
 Managing application resources; designing user interfaces; data storage and retrieval options; synchronization and replication of mobile data.  
 Communications via network and the web; networking and web services; wireless connectivity and mobile applications.  
 Performance consideration: performance and memory

management; performance and threading; graphics and user interface performance; use various facilities for concurrency.

Security considerations: encryptions, authentication, protection against rogue applications.  
 Location based application; location API.  
 Packaging and deploying applications for mobile devices.

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#### **CS4174 - PERFORMANCE TECHNOLOGY 1**

*ECTS Credits:* 6 (Year 2 Module)

##### **Computer Science & Information Systems**

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

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

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

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#### **Department of Computer Science & Information Systems Year 3 Modules**

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#### **CS4005 - PERCEPTUAL SYSTEMS AND MULTIMEDIA**

*ECTS Credits:* 6 (Year 3 Module)

##### **Computer Science & Information Systems**

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

**Syllabus:** Fundamentals of physical dimensions used by

human sensation and perception - light, sound, heat, pressure;

Fundamentals of the senses of hearing, seeing and touch: physiology and function;  
 Psychophysical measures and correlates of perception;  
 Introduction to Signal Detection Theory;  
 Theories of perception, perceptual organisation, attention, object recognition, depth perception and motion perception; Navigation and Spatial Cognition;  
 Multimodal integration;  
 Memory and training; introduction to theories of mind and their relationship to theories of mediation, communication and perception.

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#### **CS4006 - INTELLIGENT SYSTEMS**

*ECTS Credits:* 6 (Year 3 Module)

##### **Computer Science & Information Systems**

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

**Syllabus:** To provide students with an understanding of the basic principles, methods and application domains for Artificial Intelligence. To introduce students to the development of Intelligent Systems, Knowledge Representation, and Machine Learning.  
 This module introduces the history and development of Intelligent system concepts. It includes discussions on AI and Expert Systems, Heuristic Search, Evolutionary Algorithms, Artificial Neural Networks, Cognitive Science, and issues in representation, reasoning and machine learning, together with a set of design principles for intelligent autonomous agents.

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

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#### **CS4030 - DIGITAL ARTS 2**

*ECTS Credits:* 6 (Year 3 Module)

##### **Computer Science & Information Systems**

**Rationale and Purpose of the Module:** This module builds upon the curriculum of a range of modules especially Digital Arts 1. It deepens the engagement with this field by introducing the perceptual and aesthetic ramifications of the digital arts and situates the wide range of practices within cultural, psychological, political and economic models. It provides a foundation enabling students to situate, develop and specialise their digital arts practice as well as a context to which digital arts research can be related.

- Syllabus:**
1. Video Art
  2. Film Theory
  3. Installation and Interactive Art
  4. Electronic and Experimental Music
  5. Digitally Enabled Sculpture
  6. Sound Art

Prerequisites: CS4019

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#### **CS4040 - ADVANCED VIDEO PRODUCTION**

ECTS Credits: 6 (Year 3 Module)

#### **Computer Science & Information Systems**

**Rationale and Purpose of the Module:** To give students a theoretical grounding in digital media formats, to explore the fusion of the sonic with the visual and to combine skills in video, graphics and animation toward creating higher-quality video content.

- Syllabus:**
1. Collaborative Design (Creation, Production, Delivery)
  2. Semiotic theories relevant to media, meaning, artist and audience
  3. Theories underpinning audio-visual production
  4. Conceptual Design Approaches
  5. Performance Practice Aesthetics
  6. Client relations relevant to audio-visuals
  7. Video Art Aesthetics

Prerequisites: CS4053, CS4034

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#### **CS4056 - MOBILE APPLICATION DESIGN**

ECTS Credits: 6 (Year 3 Module)

#### **Computer Science & Information Systems**

**Rationale and Purpose of the Module:** To introduce students on digital media and music technology programmes to the creation of content and the development of applications for mobile devices.

**Pre-Requisite Modules:**  
(CS4061 Media Programming 1 & CS4082 Introduction to Web Development)  
*OR*  
(CS6221 Programming Protocols for Musical Systems)

- Syllabus:**
- Challenges of designing applications for mobile devices.
  - Design dimensions for mobile applications: scenario-related dimensions, interaction-related dimensions, user-related dimensions, data/content related dimensions and communication-related dimensions.
  - Designing for multiple mobile platforms and multiple displays: practical guidelines, techniques, standards and best practices.
  - Content optimization and design skills for mobile application development.
  - Creation of raster and vector visual assets for mobile applications using a variety software products.
  - Creation of applications for mobile devices using a development environment suited to the programming skills and abilities of the students that will take this module.
  - Applications will work with images and sound; the creation of animated applications; list manipulation; parsing comma-delimited files and XML files; work with databases; text-to-speech and speech-to-text; read and respond to sensors, communicate with web APIs.

Prerequisites: CS4061, CS4082, CS6221

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#### **CS4066 - ALGORITHMIC AND GENERATIVE COMPOSITION**

ECTS Credits: 6 (Year 3 Module)

#### **Computer Science & Information Systems**

#### **CS4076 - EVENT DRIVEN PROGRAMMING**

ECTS Credits: 6 (Year 3 Module)

#### **Computer Science & Information Systems**

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

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

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#### **CS4106 - MACHINE LEARNING: METHODS AND APPLICATIONS**

ECTS Credits: 6 (Year 3 Module)

#### **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 involved in machine learning, focusing mainly on the field of evolutionary computation and associated paradigms.

**Syllabus:** Following an overview of general machine learning methods and applications, the goal is to provide students with an understanding of the basic principles, methods and application domains for evolutionary computation. Students will be introduced to a broad range of evolutionary computation techniques including genetic algorithms, genetic programming, and grammatical evolution. Different representational mechanisms including binary, Gray, real-valued and e-code will be discussed. Different approaches to the mutation and recombination operators will be presented. Fitness function types and interactive evolutionary computation

will be introduced.

Depending on the particular expertise of the lecture involved in delivery of the module particular emphasis may be placed on application to areas such as neuroevolution, evolutionary robotics (including evolutionary humanoid robotics), automatic program synthesis, the parallelisation of sequential programs, and financial modelling and prediction. Potential societal, ethical and philosophical implications of advanced AI/ML technologies will be outlined.

**Prerequisites:** CS4006

#### **CS4115 - DATA STRUCTURES AND ALGORITHMS**

**ECTS Credits:** 6 (Year 3 Module)

##### **Computer Science & Information Systems**

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

**Syllabus:** - Mathematics Review;

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

#### **CS4116 - SOFTWARE DEVELOPMENT PROJECT**

**ECTS Credits:** 6 (Year 3 Module)

##### **Computer Science & Information Systems**

**Rationale and Purpose of the Module:** *This module is intended to provide the student with an opportunity to undertake a semester long software development*

*project. A student will gain experience of working in a team and the confidence to tackle a large software system.*

**Syllabus:** A substantial semester-long software project is set. Students, working in teams, produce a complete implementation. A partially specified project is presented. Students complete the requirements and then take the project through the design, coding and testing stages. Students will use a version control system to maintain their software and manage commits and conflicts. A relational database design will be created that notions such as full normalisation and stored procedures. Students will need to understand how to generate fully responsive websites and the interaction of CSS, JavaScript and HTML. The language and technology of implementation depends on the type of project specified but will generally allow students as much free choice as possible. (Lectures and labs will run from weeks 1 to 5 inclusive). These along with tutorials during this period will build on existing modelling, design and programming skills required to achieve the proposed system. During the remainder of the semester students will meet with their assigned supervisor to discuss their work to date in a tutorial setting on a regular basis.)

#### **CS4126 - 3D MODELLING AND DIGITAL FABRICATION**

**ECTS Credits:** 6 (Year 4 Module)

##### **Computer Science & Information Systems**

**Rationale and Purpose of the Module:** *The main objective of this module is to promote a good understanding of the 3D modelling and digital fabrication process, as well as to develop a range of skills on digital fabrication to be applied in different interaction design areas. The module aims to inform and facilitate the development of specific skills, which will be utilised in the design process. The knowledge and skills acquired will potentially be applied to Final Year Projects and portfolio development and will improve graduates' employability prospects in multiple sectors.*

**Syllabus:** · Introduction to digital fabrication: overview, evolution, technological developments · Forms of digital fabrication: additive vs subtractive, technologies: 3D printing, laser cutting, milling · Modelling: 2D, 3D. CAD systems. 3D scanning. · FreeCAD drawing and modelling software. · Creating 2D drawings and models in CAD

systems · Fabrication of physical objects from 2D models by laser cutting · Creating 3D drawings and models in CAD systems · 3D printing technologies, materials, workflow. · Fabrication of physical objects from 3D models by 3D printing · Prototyping using digital fabrication. Evaluating physical prototypes. · Applications of digital fabrication: art, design, architecture, medicine, manufacturing

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#### **CS4815 - COMPUTER GRAPHICS**

**ECTS Credits:** 6 (Year 3 Module)

##### **Computer Science & Information Systems**

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

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

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

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

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

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#### **CS4826 - HUMAN-COMPUTER INTERACTION**

**ECTS Credits:** 6 (Year 3 Module)

##### **Computer Science & Information Systems**

**Rationale and Purpose of the Module:** *The objective*

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

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

## Department of Computer Science & Information Systems Year 4 Modules

### CS4047 - MULTIMEDIA INDUSTRY PERSPECTIVES ECTS Credits: 6 (Year 4 Module)

#### Computer Science & Information Systems

**Rationale and Purpose of the Module:** The purpose of the Multimedia Industry Perspectives module is to develop student understanding and knowledge about various digital media industry processes, and to encourage students to examine digital media as a number of varying career options. It will provide the opportunity to introduce a number of external experts from a variety of multimedia industry related areas within a flexible framework.

**Syllabus:** This module introduces the students to a number of external experts from a variety of multimedia industry related areas, within a flexible framework. The set of topics that will be discussed as part of this module will include:  
 Exploring the job market and applying for a job (CV and portfolio preparation, cover letter writing, maintaining an online presence).  
 Identifying professional communities, information resources and networking opportunities.  
 Job profiles and frequently required skills.  
 Recent development in the digital media domain.  
 Basic entrepreneurial skills: developing a business idea, drafting and presenting a business plan.  
 Each unit is assessed by coursework and/or class test; there is usually no formal examination at the end of the semester.

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### CS4049 - VISUAL CODING ECTS Credits: 6 (Year 4 Module)

#### Computer Science & Information Systems

**Rationale and Purpose of the Module:** To introduce students to the principles behind algorithmic visuals and the practice of creating visuals through programmed, procedural approaches

**Syllabus:**

1. Procedural Visuals
2. Low-Resolution Displays
3. Matrix Displays
4. Networked Data & Visuals
5. Real-time Data Visualization
6. Audio-visual Installations
7. Sensors & triggered audio-visuals

**Prerequisites:** CS4061, CS4072, CS4815

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### CS4067 - WRITING GAMES ANALYSIS ECTS Credits: 6 (Year 4 Module)

#### Computer Science & Information Systems

**Rationale and Purpose of the Module:** The primary

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

**Syllabus:**

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

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### CS4078 - APPLIED INTERACTION DESIGN ECTS Credits: 6 (Year 4 Module)

#### Computer Science & Information Systems

**Rationale and Purpose of the Module:** This module will provide the student with knowledge of and practical experience in using techniques for the design of engaging interaction.

Building on the design knowledge and technical skills the students have acquired at this stage of their course, applied interaction design problems will be presented to the students for analysis, reflection and intervention. Adaptation of Interaction Design methods will be discussed, and the particular perspective of Participatory Design will be examined in detail.

**Syllabus:** This module deals with topics and methodologies for Interaction Design work. The topics include:

Overview of the latest literature and current practical projects in interaction design  
Exploration and evaluation of practical approaches to interaction design as a discipline in a variety of current settings, and particularly of Participatory Design methods.

Exploration of novel interaction modalities around tangible, ubiquitous and wearable devices.  
Application and adaptation of interaction design methodologies to specific design settings.

Discussion and review of sensitive design settings such as healthcare, safety-critical environments, education, etc

The role of high-fidelity prototypes in developing the interaction design process The discussion and analysis of these topics will be based around practical interaction design assignments.

#### CS4088 - USER EXPERIENCE IN PRACTICE

ECTS Credits: 6 (Year 4 Module)

#### Computer Science & Information Systems

**Rationale and Purpose of the Module:** In this module students will acquire skills commensurate with the commercial aspects of the professional User Experience Designer (UX) role from a business perspective.

**Syllabus:** Methods, tools, and standards will be covered to allow students to follow the lifecycle of a project from answering the project brief to final client proposal and approval. Practical elements achieved: the students will be presenting their interactive wireframes / stories for assessment.

Prerequisites: CS4052, CS4826, CS4056

#### CS4158 - PROGRAMMING LANGUAGE TECHNOLOGY

ECTS Credits: 6 (Year 4 Module)

#### Computer Science & Information Systems

**Rationale and Purpose of the Module:** To provide students with an understanding of production systems,

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

**Syllabus:**

- Notion of Phrase Structure;
- Notion of Post's Production Systems;
- Chomsky's definition of Phrase structure Generative Grammars, and Hierarchy of Grammars. Sentential Forms and Languages generated by Context Free Grammars;
- Regular expressions, Regular sets, and Regular Grammars;
- Classification of Abstract State Machines, Configurations, Transitions;
- Construction of Recognising Finite State machines from Regular Grammars and Conversely 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

#### CS4168 - DATA MINING

ECTS Credits: 6 (Year 4 Module)

#### Computer Science & Information Systems

**Rationale and Purpose of the Module:** Introduce students to the main components of the data mining process, such as data preparation, feature extraction and

feature selection, machine learning algorithms for building predictive and descriptive analytics models, evaluation of data analytics models.

**Syllabus:** 1. What is data mining; what is the relation between data mining, data analytics, data science; why data mining; cross-industry standard process (CRISP-DM); data mining workflows.

2. Data pre-processing: feature extraction, data cleaning, handling missing data, methods for identifying outliers, data transformation.

3. Methods for feature selection: filter, wrapper and embedded methods.

4. Styles of machine learning for data mining: supervised vs. unsupervised learning, classification, numeric prediction, clustering, association learning.

5. Algorithms for building predictive and descriptive analytics models:

a. Predictive modelling algorithms for classification and numeric prediction, such as OneR, ID3, C4.5, Naïve Bayes, k-NN, Prism, SVM, linear regression, logistic regression, Perceptron, Winnow.

b. Descriptive modelling algorithms for clustering and association learning, such as k-means, apriori, max-miner.

6. Evaluation of predictive and descriptive analytics models: Holdout and cross-validation, cost-benefit analysis, user feedback.

7. Visual analytics: methodology and workflow.

8. Case studies in subdomains, such as sentiment analysis, item/service ranking recommendation, image classification, etc.

9. Practical use of data mining platforms for building data mining workflows and training predictive and descriptive analytics models.

#### CS4187 - PROFESSIONAL ISSUES IN COMPUTING

ECTS Credits: 6 (Year 4 Module)

#### Computer Science & Information Systems

**Rationale and Purpose of the Module:** Information and Communication Technology (ICT) industries employ large numbers of people who create technologies affecting a wide range of different types of communities within society as a whole. It is very important that students who will be entering these industries do so with an understanding of ethical professional and cultural

issues that they will need to engage with as professionals. To this end Professional Issues in Computing focuses on the ethical, legal and social consequences of the design, implementation and use of computer and information systems.

**Syllabus:** What is a computer professional?

Ethical theories including: consequentialism and non-consequentialism; utilitarianism; deontological theory. Ethical decision making frameworks.

Applying ethical theories to moral problems in ICT.

Codes of conduct of professional bodies in ICT.

Legal implications of being a professional including:

Intellectual property law; privacy and data protection; computer crime; Irish, European and American laws and potential for conflict.

Conflict between the legal and the ethical approaches.

Social impacts of ICT including: Digital divide - exclusion based on: race, gender, age, language; North/South divide, power and democracy, unstoppable progress, physical and social disability.

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### CS4358 - INTERACTIVE MULTIMEDIA

ECTS Credits: 6 (Year 4 Module)

#### Computer Science & Information Systems

**Rationale and Purpose of the Module:** *To understand the principles and techniques of Interactive Media. Content creation, processing and management. High-level authoring. Distribution methods. Intellectual Property Rights.*

**Syllabus:** - Introduction to Digital Media: overview; communication theory; mediation.

- Cognitive Models: representation of aspects of mind; acquisition of knowledge.

- Interaction Design: linking media and support objects in temporal structures.

- Metaphors: describing concepts in accessible form; interface metaphors; domain metaphors.

- Image, Video and Sound Processing: introduction to high-end processing tools such as Adobe PhotoShop, Adobe Premiere, SoundForge, etc.; media asset management.

- Authoring: introduction to high-end authoring tools such as Macromedia Director, Authorware, Flash, etc.; synchronisation.

- Interfacing high-end authoring systems: extending the

functionality of authoring systems through plugins; design of plugins.

- Distribution: CD, DVD, Web, DAB, DVB; quality and bandwidth considerations; compression; streaming.
  - Intellectual Property Rights, Copyright.
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### CS4457 - PROJECT MANAGEMENT AND PRACTICE

ECTS Credits: 6 (Year 4 Module)

#### Computer Science & Information Systems

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

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

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### CS4458 - COMPUTER SUPPORTED COOPERATIVE WORK

ECTS Credits: 6 (Year 4 Module)

#### Computer Science & Information Systems

**Rationale and Purpose of the Module:** *This module will introduce students to the CSCW and groupware field. It will cover basic concepts in the field and include an examination of software systems designed to support cooperative work - their design, use and evaluation. Issues such as peripheral awareness, ownership of information, common information spaces, media spaces, group support systems, coordination mechanisms and contextual factors in the workplace will be studied. Students will use some groupware technologies and undertake a project.*

**Syllabus:** The limitations of traditional HCI;

Understanding the work context;

Cooperative work;

Methods for observing work - field studies and ethnography;

Coordination mechanisms;  
Examination of variety of commercial and research collaborative systems;  
Constructing common information spaces;  
Examining collaborative learning in the workplace;  
Evaluation methods for CSCW;  
Open issues in the field.

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# Electronic & Computer Engineering Year 1 Modules

## CE4702 - COMPUTER SOFTWARE 2

ECTS Credits: 6 (Year 1 Module)

### Electronic & Computer Engineering

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

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

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

*Prerequisites:* CE4701

## EE4012 - CIRCUIT ANALYSIS 1

ECTS Credits: 6 (Year 1 Module)

### Electronic & Computer Engineering

## EE4022 - SEMICONDUCTOR DEVICE

### FUNDAMENTALS

ECTS Credits: 6 (Year 1 Module)

### Electronic & Computer Engineering

## EE4522 - DIGITAL SYSTEMS 1

ECTS Credits: 6 (Year 1 Module)

### Electronic & Computer Engineering

**Rationale and Purpose of the Module:** This module is the first module in the core Digital Systems stream of the BE programmes in the department of Electronic and Computer Engineering.

**Syllabus:** Introduction to digital systems  
 Distinguish between analog and digital representations.  
 Number systems and codes  
 Conversion between number systems.  
 Describing Logic Circuits  
 Truth tables and Basic Boolean manipulation  
 Simple Gating functions, Data selectors.  
 Demultiplexers.  
 Karnaugh Mapping  
 Logic Characteristics  
 Delays and spurious responses. Buffers, Schmidt inputs.  
 Characteristics of CMOS digital ICs.  
 Basic Arithmetic  
 Unsigned numbers, signed numbers. 1's and 2's complement arithmetic  
 Ripple carry adders  
 Latches and flip-flops  
 D-type level triggered. Edge-triggered D-type.  
 J-K  
 Timing waveforms for flip-flops  
 Shift register operation  
 Edge-triggering concepts, Propagation delay, set-up, hold, asynchronous inputs  
 Registers and counters:

## ET4162 - COMPUTING SYSTEMS ORGANISATION

ECTS Credits: 6 (Year 1 Module)

### Electronic & Computer Engineering

**Rationale and Purpose of the Module:** By introducing the concept of connected computing using networking

examples,  
 students will appreciate the driving forces affecting computer organisation and architecture.  
 Students will learn about Instruction Set Architecture and its significance in computer design.

### Syllabus:

1. Networking Basics
  - a. Exploring the influence of networking on computer organisation
  - b. Introduction to networking infrastructure
  - c. Networks and the internet
2. Error correcting codes
3. Assembly language programming
4. Computer performance and performance measurement
5. RISC, CISC and limitations of each
6. An overview of multicore processing
7. Memory hierarchy in detail

# Electronic & Computer Engineering Year 2 Modules

## EE4024 - ELECTRICAL ENERGY (ELECTRICAL MACHINES)

ECTS Credits: 6 (Year 2 Module)

### Electronic & Computer Engineering

Review of electromagnetism, Faradays, Amperes and Lezs laws, MMF, flux, flux density, magnetic field intensity and reluctance, self and mutual inductance, magnetic materials, BH curves, core losses. Magnetic circuits, electric circuit analogies, analysis of simple magnetic circuits.

Transformers: Construction and principles, ideal transformer, voltage and current transformers, power transformers, single/3 phase, equivalent circuits, open and short circuit tests, application in power systems, per unit system.

Machines - DC motors and generators: construction and principles, separately excited, series, shunt and compound machines. Voltage and torque equations. Equivalent circuits, Power flow. Machine

characteristics: open circuit/magnetization, speed, torque and dynamic characteristics. Which configuration for which application. DC machines in modern power generation and motion control. AC machines, rotating magnetic fields, alternators, 3 phase generators, salient pole/cylindrical rotor, derivation of equivalent circuit from open circuit and short circuit tests, synchronous reactance, the phasor diagram (of cylindrical rotor machine) and the Power Angle Curve. Synchronising to an infinite busbar. Steady state stability limit. Induction machines (motors and generators) single phase, 3 phase. Derivation of equivalent circuit, determination of torque speed characteristic. Locked-rotor and no-load tests. Induction generator. Introduction to V/F control. Starting methods and protection. Electrical machines developments for renewable energy generation. AC power real and reactive power calculations. Power factor correction, balanced 3 phase systems analysis, star and delta connected loads, advantages of 3 phase systems, the per unit system.

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#### **EE4044 - COMMUNICATIONS AND NETWORKS**

##### **PROTOCOLS**

*ECTS Credits: 6 (Year 2 Module)*

#### **Electronic & Computer Engineering**

**Rationale and Purpose of the Module:** *The main objective of this course is to provide an opportunity for students to gain a basic understanding of Communication Networks and Protocols*

**Syllabus:** Motivations and objectives of computer networks; overview of layered architecture and the ISO Reference Model; network functions, circuit-switching and packet-switching; physical level protocols; data link protocols including HDLC and multi-access link control. Network control, transport, and session protocols including routing flow control; end-to-end communication and inter-networking. Presentation layer protocols including web, virtual terminal and file transfer protocols, cryptography, network security. It also introduces some important merging technologies, such as, integrated voice and data networks (VOIP) and the integration of wireless and wired networks. Specific examples and standards will be cited throughout the course.

*Prerequisites: EE4313*

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#### **EE4214 - CONTROL 1**

*ECTS Credits: 6 (Year 2 Module)*

#### **Electronic & Computer Engineering**

**Rationale and Purpose of the Module:** *The module introduces students to some basic control theory, Dynamic System Modelling, open- and closed-loop systems, signal flow graphs, time response of first and second order systems. This module also gives students a basic introduction (from the control perspective to support the control theory and dynamic systems modelling) to some of the basic devices used in control, including actuators, sensors and transducers.*

**Syllabus:** Dynamic System Modelling: Laplace Transform method, open and closed loop systems, signal flow graphs, transfer functions, time response of first and second order systems.  
Laboratory Work: Modelling and simulation of dynamic systems using Matlab Simulink and LabVIEW. Basic laboratory exercises, including data acquisition from sensors.  
Introduction to instrumentation. Sensor characteristics. Signal conditioning. Review of typical sensors.

*Prerequisites: MA4001, MA4002, MA4003*

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#### **EE4314 - ACTIVE CIRCUIT DESIGN 2**

*ECTS Credits: 6 (Year 2 Module)*

#### **Electronic & Computer Engineering**

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

**Syllabus:** THE DIFFERENTIAL AMPLIFIER AS A TWO ENDED INPUT AMPLIFIER. Introduce the diff amp as the input element to Op Amps. Define the terms Differential Gain, Common Mode Gain and Common Mode Rejection Ratio  
OP-AMP CHARACTERISTICS: Simplified internal view of a typical 3-stage op-amp, current limiting, open-loop transfer curve, offset error. Op-amp configurations;

current in, voltage out etc. Finite gain errors. Slew limitations.

OP-AMP LINEAR APPLICATIONS: Selected linear applications, including voltage amplifiers, regulators, integrators and instrumentation issues.

FEEDBACK: Effects of feedback on gain, input impedance, output impedance, correction of disturbances. Bandwidth of single pole amplifiers. Op-amp frequency shaping networks. Placing poles and zeros in the closed loop response.

OP-AMP NON-LINEAR APPLICATIONS: Comparators, Schmitt trigger, rectifiers, peak detectors etc. Non-linear oscillators (square-triangle), monostable circuits.

A.C. COUPLED AMPLIFIERS: Low frequency limitations, break points, Bode plots, design steps.

ANALOGUE SIGNAL CONVERSION: Introduction to D/A and A/D as system functions. D/A conversion using R-2R ladders with I/V conversion. DAC specifications.

Description of A/D conversion using successive approximation method. Differential signalling, line drivers and hardware for serial data transmission.

*Prerequisites: EE4313*

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#### **EE4524 - DIGITAL SYSTEMS 3**

*ECTS Credits: 6 (Year 2 Module)*

#### **Electronic & Computer Engineering**

**Rationale and Purpose of the Module:** *The module provides an in-depth treatment of the following topics: Basic Microprocessor; Processor Architecture and programming in machine code; Instruction sets, Addressing modes, Data formats; Exception handling, I/O programming; Software polling, Interrupts, Basic interrupt processing concepts, Interrupt service routines (ISRs); C programming as a programming language for embedded systems; Practical application of using a software development toolchain. (Digital Systems 1 on the programme is a prerequisite for this module.)*

**Syllabus:** Microprocessor and Microcontroller Architecture:

Processor Architecture and programming in machine code. Programmer's model, data formats including integer types, floating point numbers, ASCII and Unicode. Program instruction cycle.

Instruction sets:

Addressing modes: register, immediate, direct, indirect, relative. Program control flow instructions. Stacks, local variables and subroutines. Exception handling.

#### I/O programming:

Simple handshaking concepts. Software polling. Interrupts: Basic interrupt processing concepts. Interrupt service routines (ISRs). Interrupt hardware -fixed versus programmable priority, interrupt vectoring.

C programming as a programming language for embedded systems:

Pointers and Macros in embedded software. Linking and sub-programs. Assembly programming and C.

Memory: Addressing concepts, including memory mapped and I/O mapped I/O. Volatile and non-volatile memory. ROM, RAM.

Serial data: Asynchronous and synchronous transfers. RS232, SPI, I2C.

Prerequisites: CE4701

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#### ET4004 - TCP / IP NETWORKING

ECTS Credits: 6 (Year 2 Module)

#### Electronic & Computer Engineering

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

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

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

Transport layer: Unreliable datagram transport with UDP; real-time transport with RTP and RTCP; reliable

connection-oriented transport with TCP and SCTP; wireless TCP.

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

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#### ET4014 - DATA SECURITY

ECTS Credits: 6 (Year 2 Module)

#### Electronic & Computer Engineering

**Rationale and Purpose of the Module:** *To introduce the concept of security services such as authentication, integrity and confidentiality.*

*To introduce the role of digital signatures and their implementation using cryptographic ciphers.*

*To introduce basic security protocols that provide security services.*

*Attacks against security services: Replay attack, man in the middle attack.*

**Syllabus:** [Introduction to Security Services:] Security attacks, OSI model, security services: concepts of confidentiality, data origin authentication, entity authentication, data-integrity, access control, availability. [Digital Signatures:] The role of signatures, MACs, Hash functions, digital signatures, public key certificates, X509 certification authorities, e-mail security: PGP.

[Security Protocols:] Introduction to key management, peer-to-peer distribution protocols and identification protocols. Secure web (https/ssl), secure shell (ssh) etc.

[Identification techniques:] Identification tokens and smart cards. Biometric identification: finger prints, retina scan, face recognition, voice recognition.

[Attacks:] Definition of attacker and capabilities of attacker, introduction to attacks on protocols, such as replay attacks, man in the middle attack.

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#### ET4122 - ANALOGUE ELECTRONICS 2

ECTS Credits: 6 (Year 2 Module)

#### Electronic & Computer Engineering

**Rationale and Purpose of the Module:** *The aim of this*

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

**Syllabus:** SINUSOIDAL SIGNALS: Single phase generation by coil rotating in magnetic field.

Trigonometric representation, amplitude, frequency and phase concepts. Voltage and current relationships for resistor, inductor and capacitor. Reactance. Response of R-C, R-L and L-C circuits to sinusoidal signals.

Impedance. Phasor diagrams. Power topics; distinction between power and VA, power factor.

COMPLEX ANALYSIS: Analysis of circuits using complex notation, derivation of amplitude and phase data from complex representation of signals and impedance.

Transfer functions, frequency response, corner frequency, Bode diagrams for simple R-C circuits. Power dissipation in complex impedance. Maximum power transfer theorem for complex source and load impedances.

TUNED CIRCUITS: Series and parallel R-L-C circuits, resonance, Q, bandwidth, dynamic impedance.

Circulating current in parallel tuned circuit.

COUPLED CIRCUITS: Inductively coupled coils, induced e.m.f., mutual inductance, coupling coefficient. Reflected impedance for loaded coupled circuit for  $k < 1$ . Input and output equivalent circuits. Properties of ideal voltage and current transformers. The auto transformer.

Prerequisites: ET4141

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#### ET4243 - WEB AND DATABASE TECHNOLOGY 2

ECTS Credits: 6 (Year 2 Module)

#### Electronic & Computer Engineering

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

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

**Prerequisites:** ET4132

## Electronic & Computer Engineering Year 3 Modules

### CE4206 - OPERATING SYSTEMS 2

ECTS Credits: 6 (Year 3 Module)

#### Electronic & Computer Engineering

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

**Syllabus:** 1) Processes: Concurrency, states, queues, scheduling. 2) Process Communication: Mutual exclusion, race conditions, busy-waiting solutions, Test/Set locks, semaphores, monitors, simple message passing, pipes, classical problems. 3) Memory Management: Swapping,

virtual memory, paging, segmentation, performance and protection issues. 4) File systems to support multitasking: File sharing, file protection, performance issues. The UNIX i-node system. 5) Deadlock: Conditions for deadlock and solutions. 6) Input/Output: I/O Devices for multitasking environments, need for design of re-entrant drivers. 7) Computer Security and Protection: User authentication; protection matrix; ACL; capabilities. 8) Case Study: The UNIX Operating System: Origins; Standards; Shells; Utilities; Process Management; Memory Management; File Management; Programming in the Unix environment (Or, equivalent study based on a WIN-32 operating system.)

**Prerequisites:** CE4204

### EE4216 - CONTROL 2

ECTS Credits: 6 (Year 3 Module)

#### Electronic & Computer Engineering

**Rationale and Purpose of the Module:** This module extends fundamental Control principles with much more emphasis placed on the application of linear analytical techniques to control system design.

**Syllabus:** LINEAR SYSTEM ANALYSIS: Bode, Nyquist, and root locus, transfer function of plant with delay and non-minimum phase systems. Stability and Performance analysis using Bode, Nyquist, Routh-Hurwitz, and Root Locus methods. Design techniques for system compensation using Bode diagrams, Nichols charts and Root Locus. Lead and lag compensation, the application of these using op-amps as an example, internal compensators. Introduction to Modern Control methods using State Space Techniques.

PROCESS CONTROL: Terminology and practice, application and use of three term control, PID design in the frequency domain, integral wind-up and similar problems, Benchmark methods for tuning PID controllers, (Ziegler-Nichols, Haalman etc.,).

### EE4816 - SIGNALS AND SYSTEMS 1

ECTS Credits: 6 (Year 3 Module)

## Electronic & Computer Engineering

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

**Syllabus:** Signal Classification: pulse waveforms, periodic waveforms, sine waves and phasors, signal symmetry. Fourier Series and Fourier Transform. Sampling, replication, and aliases. Finite Fourier Series and the DFT. Correlation and Convolution, digital and analogue. Introduction to Digital Filters and the DtFT. Windowing of signals, aspects of A/D and D/A conversion. Discrete-time systems and the z-transform. Elementary FIR filter design. LP, BP and HP filters. Simple IIR filters, intuitive design methods.

### ET4006 - ELECTRONICS (ED)

ECTS Credits: 6 (Year 3 Module)

#### Electronic & Computer Engineering

**Rationale and Purpose of the Module:** To provide the students with the knowledge and skills required to specify and manage classroom based projects using analogue and digital electronic devices and equipment available in schools. To develop the knowledge, skills, values and attitudes appropriate to the teaching of technologies.

**Syllabus:** Transistor switch and operational amplifier circuits (op-amps) with output devices lamp, buzzer, LED, speaker, motor, relay. Operational amplifier circuits (op-amps) assembled as comparator, amplifier, and oscillator. Simple timing circuits. Logic Circuits, basic logic gates AND, OR and NOT NAND, truth tables for each. The main logic families (TTL and CMOS). The use of logic gates with sensors and output devices. Inputs and Outputs, buffers (transistors, amplifiers, paralleled outputs), Schmitt trigger. Binary inputs. Counters, clock circuits, de-bouncers, counters, seven segment displays and display drivers. Circuit Design and Assembly of Pre-designed Circuits. Printed circuit boards (PCBs) Use of

prototyping boards for initial assembly and testing of circuits. Strategies for teaching this subject area at second level. Designing, planning and managing appropriate teaching and learning activities for this subject area.

## Electronic & Computer Engineering Year 4 Modules

### CE4208 - DISTRIBUTED SYSTEMS

ECTS Credits: 6 (Year 4 Module)

#### 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.

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

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

Prerequisites: CE4607, CE4206

### CE4717 - LANGUAGE PROCESSORS

ECTS Credits: 6 (Year 4 Module)

#### Electronic & Computer Engineering

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

**Syllabus:** Compiler structure: Definition of terms. Source, object and executable files. Symbols, definition and resolution. Phases of a compiler and their functions. Single and multi-pass compilation. Cross-compilation, interpreters and pseudo-machines.

Grammars: Mathematical grammars for language definition. BNF and EBNF notations. Parse trees. Properties of grammars. The Chomsky hierarchy. Syntax diagrams. Restrictions on grammars.

Parsing: Top-down parsing. Lookahead. Recursive descent. LL(1) grammars. First, follow and predict sets. Syntactic error detection and recovery for recursive descent parsers.

Semantic processing: The symbol table. Handling semantic errors.

Code generation for a simple stack machine: Translation of expressions to reverse-Polish form. Procedure calls and block structure. Static and dynamic scope. Storage management for modern languages.

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

Table-driven parsing techniques:

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

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

Prerequisites: CE4703

### EE4038 - POWER ELECTRONICS

ECTS Credits: 6 (Year 4 Module)

## Electronic & Computer Engineering

**Rationale and Purpose of the Module:** This module will give students (ECE BE/ME students) an understanding of modern power electronics both at the device/products level and at the renewable energy generation and distribution level.

The module is to replace EE4328 Power Electronics and upgrade the content of this module for BE/ME 4th/5th year level 9.

This module will be offered to the Master of Engineering in Electronic and Computer Engineering programme using module ID 3299 Power Electronics

**Syllabus:** Introduction (examples of typical power conversion applications e.g. a complete computer power supply system block diagram/space craft system, importance of efficiency, comparison linear vs switching supplies, overview key components utilised in power conversion)

Switch realisation: semiconductor switches: diodes, Power MOSFETs, Thyristors, GTOs, IGBTs, properties, circuit symbols, comparative characteristics and application areas, power losses in switches.

The ideal switch, ripple and switching frequency, conduction losses, switching losses.

Switch mode power conversion: basic concepts; role of inductors, capacitors and transformers.

Analytical treatment of converters in equilibrium (steady-state converter analysis).

Modelling and simulation of converter in steady state (SIMPLIS)

Overview conversion topologies (non-isolating buck, boost, buck-boost)

Three phase full wave uncontrolled rectifier with inductive loads: circuit diagram, waveforms, output voltage, input current, input harmonics.

Single phase full wave thyristor controller rectifier: circuit diagram, waveforms and calculations.

Inverters main concepts, square wave inverters, Sine PWM inverters: circuit diagram, Circuit waveforms, Amplitude modulation index, Frequency modulation index.

Variable Speed Drive: Fixed frequency induction motor torque speed characteristic, V/F operation, torque speed capability with V/F drive, typical V/F drive circuit diagram.

Continuous v discontinuous conduction mode.

Converter dynamics and control (overview small signals models, example topology, transfer functions). Key skill which can be applied broadly.

Energy storage and energy transfer components and magnetics (capacitive, inductive, uncoupled, coupled).  
 Modern rectifiers (topologies, harmonics)  
 High power resonant converters  
 HVAC / HVDC Power systems and conversion basic understanding.  
 Harmonics/Flicker/Reactive Power Control.  
 Modelling of power convertors.  
 Low voltage ride-through (wind application)

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### **EE4117 - ELECTROMAGNETICS 1**

*ECTS Credits: 6 (Year 4 Module)*

#### **Electronic & Computer Engineering**

**Rationale and Purpose of the Module:** *This module is a 3rd year core module for BE in Electronic Engineering (LM070).*

**Syllabus:** Review of vector calculus.  
 Electrostatics - Electric field, calculation of the electric field, electric potential, conductors and dielectrics, electrostatic field boundary conditions, capacitance. Poisson's and Laplace's equations. Current density. Resistance calculations.  
 Magnetostatics - Magnetic flux density, vector magnetic potential. Biot-Savart law, magnetic field intensity, magnetic circuits, magnetic materials, inductance. Time-varying fields - Faraday's law, Maxwell's equations, time harmonic electromagnetics, plane electromagnetic waves in lossfree and lossy media, low-loss dielectrics and conductors, power propagation and the Poynting vector, instantaneous and average power densities. Transmission lines - Transverse electromagnetic waves along a parallel-plate transmission line, transmission line equations, wave characteristics along infinite and finite lines, transmission lines as circuit elements, resistive and arbitrary terminations, the Smith chart, impedance matching.

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### **EE4317 - ACTIVE CIRCUITS 4**

*ECTS Credits: 6 (Year 4 Module)*

#### **Electronic & Computer Engineering**

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

**Syllabus:** IC technologies and components: Processing methods. Semiconductor Junctions. Passive (R and C) components and their limitations. Integration of BJTs, JFETs and MOSFETs. Device characteristics. Analogue bipolar design methods: mirrors, high-gain stages, output buffers. Analogue CMOS design methods: mirrors, high-gain stages, output buffers. Digital logic families, an overview. Analogue building blocks: overview of op-amps, comparators and PLLs. CMOS and BiMOS technologies. Review of some analogue ICs, bipolar and MOS.

**Prerequisites:** EE4316

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### **ET4018 - MOBILE AND WIRELESS COMMUNICATIONS**

*ECTS Credits: 6 (Year 4 Module)*

#### **Electronic & Computer Engineering**

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

**Syllabus:** Digital mobile and personal communications systems: General configuration of cellular systems; comparison a with fixed communications systems;

systems overview: Fixed wireless Access, cellular, WLAN, Wireless Personal Area Network (WPAN), satellite.

Cellular Concepts: Frequency reuse; channel assignment; capacity; sectoring. Review of wireless transmission; Signals, propagation issues, coding, modulation, multiplexing, spread spectrum.

Medium access control: SDMA, TDMA, FDMA, CDMA, WCDMA, effects of Multiple Access Interference and ISI. Mobile telecommunications systems: GSM, GPRS, EDGE, UMTS, HSDPA, future generation (4G)

Key concepts in the dynamic management of resources; call control, switching, wireless access and channel allocation, handoff, roaming, HLR and VLR.

Wireless network issues: MAC, QoS, ad-hoc networks, MANET.

Example systems: Bluetooth, IEEE 802.11, Ultra-wideband (UWB).

Mobile IP, mobile TCP issues.

Support for mobility at higher communications layers.

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### **ET4027 - COMPUTER FORENSICS**

*ECTS Credits: 6 (Year 4 Module)*

#### **Electronic & Computer Engineering**

**Rationale and Purpose of the Module:** *This module aims to give the student a firm understanding of the problems associated with computer forensics in relation to data recovery from digital media, whether the data was accidentally lost or deliberately destroyed.*

*The student will learn to extract information from a computer which might be of relevance at a crime-scene using a variety of forensic techniques, tools and commands.*

**Syllabus:** Computer Forensics: Definition; Evolution of Computer Forensics; Need for Computer Forensics in the digital age.

File systems: Disk technologies; Data organisation; File systems on Unix and Windows.

Data recovery: Recovering data and analysing data usage patterns: the Audit Trail; Use of caches, spooling, paging files, logs, backup media, computer memory (while still powered).

Tools for forensic analysis: Laboratory/project based: file system analysis tools; investigate a case study forensic problem; emphasis on the use of tools.

**ET4028 - HOST AND NETWORK SECURITY**

ECTS Credits: 6 (Year 4 Module)

**Electronic & Computer Engineering****Rationale and Purpose of the Module:** Gain an in-depth knowledge of host and network security.

Assess the security of a network.

Recommend and implement measures to prevent security threats.

Research and develop security audits.

Conversant in current trends and methodologies.

**Syllabus:** [Security Fundamentals] Basics of host and network security: threats, vulnerabilities and risk, risk assessment, business continuity and disaster recovery, security policies, defence in depth.

[Firewalls] Packet filters, stateful firewalls, proxy firewalls. DMZ concept, layout and design.

[Auditing and Intrusion Detection] Audit trail features, user profiling, intruder profiling, signature analysis, network IDS, host IDS, distributed IDS, combining firewalls and IDS.

[Wireless Security] Wireless standards and technologies: IEEE 802.11, WEP Bluetooth, BlackBerry, wireless applications. Wireless network threats: wireless packet sniffers, transmission alteration and manipulation, denial-of-service attacks.

[Designing Secure Networks] Host hardening: anti-virus software, host-centric firewalls and IDS. Installing and managing firewalls and IDS. VPN integration. Creating a security policy.

[Assessing Network Security] Assessment techniques, maintaining a security perimeter: system and network monitoring, incident response, accommodating change. Network log analysis, troubleshooting defence components, importance of defence in depth. Design under fire: the hacker approach to attacking networks.

**ET4345 - OPERATING SYSTEMS 2**

ECTS Credits: 6 (Year 4 Module)

**Electronic & Computer Engineering****Rationale and Purpose of the Module:** The prerequisite module, Operating Systems 1, introduces operating system concepts for

uniprocessor systems. This module builds on the previous module by introducing a specific operating system, UNIX, and covering the underlying design and implementation features of the UNIX operating system. A set of laboratory exercises exposes the student to the internals of the UNIX operating system.

**Syllabus:** UNIX Overview: History, standards, shells, interfaces.

UNIX architecture: Features, partition of functions and position in the layered structure

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

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

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

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

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

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

**Prerequisites:** ET4725**RE4002 - SPATIAL ROBOTICS**

ECTS Credits: 6 (Year 4 Module)

**Electronic & Computer Engineering****Rationale and Purpose of the Module:** This is a level 9 module and is an update of code-RE4006 Spatial Robotics level 9 module. This module covers a broad range of the necessary enabling and advanced

technologies required for the design, integration and operation of Modern Robots including industrial robotic arms and mobile robots.

This module will be offered to the Master of Engineering in Electronic and Computer Engineering programme using module ID 3296 Spatial Robotics

**Syllabus:** Design of Modern Robotic Systems.

Component specification; Robot Arms, sensors and actuators.

Position Control; Rigid Transformations, Kinematics, Inverse Kinematics.

Robot Programming, Sensor System Integration, Robot Grippers.

Positioning And Navigation, Position Estimation, Trajectory Following.

Advanced topics:

Robot arms: Payload analysis, Jacobians, Quaternions, Dynamics.

Robot navigation: Explicit incorporation of uncertainty in Robotic Systems design, parametric approaches stochastic models of uncertainty, Kalman Filter design, specification and implementation.

**Prerequisites:** ET4224**Mathematics & Statistics  
Year 1 Modules****MA4002 - ENGINEERING MATHEMATICS 2**

ECTS Credits: 6 (Year 1 Module)

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

**Syllabus:** [The Indefinite Integral]: Integration techniques including integration of standard functions, substitution, by parts and using partial fractions.  
 [The Definite Integral]: Riemann sums, and the Fundamental theorem of calculus.  
 Application of integration to finding [areas, lengths, surface areas, volumes and moments of inertia].  
 [Numerical Integration]: Trapezoidal rule, Simpson's rule, other Newton-Cotes formulae and Gaussian quadrature.  
 [Ordinary Differential Equations]: first order including variables separable and linear types. Linear second order equations with constant coefficients. Numerical solution by Runge-Kutta.  
 [Functions of several variables and partial differentiation.] Fitting a line or curve to a set of data points.  
 Matrix representation of and solution of systems of linear equations. Matrix algebra, invertibility, determinants.

Prerequisites: MA4001

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#### MA4302 - APPLIED STATISTICS FOR ACCOUNTING

ECTS Credits: 6 (Year 1 Module)

#### Mathematics & Statistics

**Rationale and Purpose of the Module:** This course is designed to give students the statistical background required to apply statistical techniques to data both of general interest and of interest specific to business activity.

This involves

- 1) presenting data using descriptive measures and graphical means,
- 2) presenting hypotheses that can be tested statistically, together with an appropriate interpretation of the test results and
- 3) analysing time series data and prediction. In order to deal with large data sets, the lectures are accompanied by computer laboratories using a statistical computer package (SPSS).

**Syllabus:** 1. Sampling methods and descriptive statistics - collection and tabulation of data. Descriptive measures and graphical presentation of data.  
 2. Basic concepts of probability - probabilities of the union and intersection of events, conditional probability, contingency tables.  
 3. Discrete probability distributions - the binomial

distribution. Expected values.  
 4. Continuous probability distributions the normal and Pareto distributions relevance to natural and economic phenomena.  
 5. Applications of the central limit theorem - interval estimation.  
 6. Hypothesis testing - one and two sample tests for population proportions and means. Tests of association.  
 7. The Pearson and Spearman correlation coefficient and simple linear regression.  
 8. Time Series Analysis. Trends and Seasonal Variation. Use of moving averages. Prediction.  
 9. Use of a statistical package (SPSS) for data input and transformation, as well as carrying out the statistical methods described above.

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#### MA4402 - COMPUTER MATHS 2

ECTS Credits: 6 (Year 1 Module)

#### Mathematics & Statistics

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

**Syllabus:** Real-valued functions: a geometrical approach to calculus through the graphs of functions of one or two variables (use will be made of symbolic maths packages).

Convergence of sequences.

Simple numerical methods. Iteration of functions.

Matrices: addition, multiplication and scalar multiplication. Matrices as linear transformations in computer graphics.

Graph theory: basic concepts of vertices, edges, paths, circuits, connectedness and trees. Computer representation of graphs. Graph algorithms.

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#### MA4602 - SCIENCE MATHEMATICS 2

ECTS Credits: 6 (Year 1 Module)

#### Mathematics & Statistics

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

**Syllabus:** [Integration and applications:] indefinite integral as antiderivative; integration by substitution; definite integral as area; Fundamental Theorem of Calculus; integration by parts; calculation of areas; applications in science. Introductory treatment of SimpsonÆs Rule.

[Functions of the Calculus:] domain and range; inverse trigonometric functions, hyperbolic functions, their graphs and derivatives.

[Curve sketching:] symmetries; intercepts; restrictions on range; discontinuities; uses of first and second derivatives; turning points; behaviour for large and small x ; asymptotes.

[Series:] sequences; arithmetic and geometric series; infinite series and convergence; ratio and comparison tests; power series; MacLaurin and Taylor series; addition, multiplication, differentiation and integration of power series; use as approximation of a function; limits, l'Hopital's rule.

Prerequisites: MA4601

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#### MA4702 - TECHNOLOGICAL MATHEMATICS 2

ECTS Credits: 6 (Year 1 Module)

#### Mathematics & Statistics

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

**Syllabus:** Functions of the Calculus: graphs and

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

*Prerequisites:* MA4701

### **MS4022 - CALCULUS 2**

*ECTS Credits: 6 (Year 1 Module)*

#### **Mathematics & Statistics**

**Rationale and Purpose of the Module:** This module introduces the student to sequences and series, integral calculus, ordinary differential equations and functions of several variables. It develops problem solving skills in these topics.

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

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

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

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

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

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

*Prerequisites:* MS4021

### **MS4122 - FURTHER LINEAR ALGEBRA**

*ECTS Credits: 6 (Year 1 Module)*

#### **Mathematics & Statistics**

**Rationale and Purpose of the Module:** Course restructuring in response to Project Maths.

The aim of this module is to build the student's understanding of Linear Algebra to a more advanced level. The module includes a formal treatment of Vector Spaces and Inner Product Spaces followed by a careful treatment of the properties of vectors and matrices on  $\mathbb{R}^n$  and  $\mathbb{C}^n$ .

**Syllabus:** Axiomatic treatment of Vector Spaces and Inner Product Spaces.

- Linear Independence, spanning sets.
- Bases & Dimension.
- Inner products/norms.
- Angles/orthogonality in Inner Product Spaces.
- Orthonormal bases/Gram Schmidt Orthogonalisation.
- Linear transformations/change of basis.

Properties of matrices.

- Rank, row space, column space, null space.
- Vector norms on  $\mathbb{R}^n$  and  $\mathbb{C}^n$ .
- Existence and uniqueness of matrix inverse/relation to matrix rank.

- Fredholm Alternative.
- Unitary and Hermitian properties of matrices.

Eigenvalue & Eigenvector Topics.

- Eigenvalue decomposition for Hermitian matrices.
- Algebraic & Geometric Multiplicity.
- Defective Eigenvalues and Matrices.

Similarity Transformations.

Diagonalisation/Unitary Diagonalisation.

Induced matrix norms.

Applications of the above topics.

*Prerequisites:* MS4131

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### **MS4222 - INTRODUCTION TO PROBABILITY AND STATISTICS**

*ECTS Credits: 6 (Year 1 Module)*

#### **Mathematics & Statistics**

**Rationale and Purpose of the Module:** This module replaces existing module MS4212 Introduction to Data Analysis.

The focus of the previous module MS4212 was the analysis of data without a formal background in probability. The philosophy underpinning this approach was to introduce students to real data, which was entirely absent from Leaving Certificate mathematics in the 1990s, and begin to lay the foundations for the elements of data modelling necessary for the years three and four modules in the statistics options. Probability and Statistics account for 20% of the new Project Maths syllabus. Students now entering first year have had prior exposure to elementary data handling skills and experience applying some basic ideas of probability. Consequently, it is not obvious that it is still necessary or desirable to adopt a teaching approach that separates the subject areas statistics and probability. As things stand, probability is totally absent from MS4212. One consequence of this omission is that statistical tools are introduced without proper formal theoretical justification based on probability models. Likewise, students are not as well prepared as they could be for the (rather packed) follow-on module MS4213. The intention in the revised (and renamed) first year introductory module is to include some probability in the syllabus. The strategy is to give students time to explore some of the many classical/famous problems that often arise in introductory probability. Discrete random variables and probability mass functions will be covered. As well as relieving some of the pressure in the congested semester 3 module MS4213, students will now be required to engage in more algebraic manipulation and basic mathematics. The statistical content of the module has been reconfigured to allow the inclusion of the material on probability.

**Syllabus:** Elementary Probability: permutations and combinations; axioms, rules of probability; conditional probability; independent events; probability trees; law of total probability; Bayes' rule.

Discrete Random Variables: probability mass functions (Bernoulli, binomial, Poisson, geometric); expected value, variance; Poisson approximation to the binomial; law of total expectation (discrete form).

The Normal Curve: the normal curve as an idealised histogram; areas under the normal curve; normal probability plot; illustrating the sampling distribution of the mean through applications in statistical quality control; precision of an estimate; the foundations of hypothesis testing and confidence intervals.

Gathering Data: sample surveys; designed experiments and observational studies; randomized control trials. Exploratory Data Analysis: frequencies; histogram; empirical density curve; percentiles; measures of centre; measures of spread; outliers; boxplots; scatterplots; correlation; contingency tables, Simpson's Paradox.

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

## Mathematics & Statistics Year 2 Modules

### MA4004 - ENGINEERING MATHEMATICS 4 ECTS Credits: 6 (Year 2 Module)

#### Mathematics & Statistics

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

**Syllabus:** The concept of variation - discrete and continuous variables. Graphical representation of data - frequency tables, histograms, bar charts, piecharts, boxplots.

Descriptive statistics - measures of location and dispersion.  
Basic concepts of probability - Frequency interpretation and axioms of probability. Probability of an event. Laws of addition and multiplication. Compound events.  
Conditional probability. Independence. Bayes Theorem.  
Discrete and continuous random variables - expectation and variance, moments.  
Discrete probability distributions - Binomial, Geometric, Poisson.  
Continuous probability distributions - Exponential, Normal, Uniform distributions.  
The central limit theorem.  
Statistical inference - interval estimation and hypothesis testing, type I and type II errors, one and two-tailed tests.  
Linear regression - testing for an association between two continuous variables.

### MA4604 - SCIENCE MATHEMATICS 4

ECTS Credits: 6 (Year 2 Module)

#### Mathematics & Statistics

**Rationale and Purpose of the Module:** This is a module designed for students of the life sciences and chemistry to equip them with the mathematical skills necessary for their core subjects and the ability to understand the mathematical language used in research papers in these areas.

**Syllabus:** [Complex Numbers:] necessity and definition; algebra including multiplication, conjugate, division, absolute value; Argand diagram representation; polar form, argument; exponential form; de Moivre's theorem, powers and roots.  
[Modelling with Differential Equations:] Derivation of differential equations of exponential growth and decay. Application to population growth, radioactive decay and other problems from science.  
[First Order Ordinary Differential Equations:] First order equations of variables separable and linear types; applications including chemical reactions, mixing problems, Newton's Law of Cooling, radioactive decay.  
[Second Order Ordinary Differential Equations:] Second order homogeneous equations with constant coefficients. Application to damped harmonic oscillators.  
[Partial Derivatives:] Functions of several variables; partial derivatives, definition and examples (e.g. from thermodynamics); higher partial derivatives;

optimisation and Second Derivative Test for functions of two variables.

[Linear Algebra]: Review of matrices and determinants (3X3). Lines and planes in three dimensions. Systems of equations as intersections of lines and planes. Matrices as linear transformations: scale, shear, rotation. Eigenvalues and eigenvectors. Matrix diagonalisation. Powers of a matrix. Possible applications include crystallography, forest management (sustainable yield); age-specific population growth; genetics.

Prerequisites: MA4602, MA4601

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### MA4704 - TECHNOLOGICAL MATHEMATICS 4

ECTS Credits: 6 (Year 2 Module)

#### Mathematics & Statistics

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

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

**Prerequisites:** MA4702, MA4701

### **MS4303 - OPERATIONS RESEARCH 1**

**ECTS Credits:** 6 (Year 2 Module)

#### **Mathematics & Statistics**

**Rationale and Purpose of the Module:** *The module will introduce OR and various standard techniques for decision-making. Linear programming will be covered in some depth. The student will be able to apply these techniques to realistic problems.*

**Syllabus:** Model building and the methods of operational research.

Linear programming - graphical interpretation, simplex method and sensitivity analysis. duality and the dual simplex method,

Applications of linear programming - Transportation and assignment algorithms, zero-sum games.

Critical path analysis - minimum completion time, resource constraints and resource levelling, probabilistic task durations.

Decision analysis - decision trees, expected value, utility, Bayesian approach.

**Prerequisites:** MS4213

### **MS4404 - PARTIAL DIFFERENTIAL EQUATIONS**

**ECTS Credits:** 6 (Year 2 Module)

#### **Mathematics & Statistics**

**Rationale and Purpose of the Module:** *To introduce the partial differential equations of applied mathematics and physics with some standard solutions and applications.*

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

**Syllabus:** [Introduction to PDEs:] Introduction to the partial differential equation of physics; classification of second order linear partial differential equations (hyperbolic, parabolic, elliptic).

[Wave equation:] Derivation of wave equation for strings and membranes; solutions by separation of variables; harmonics; d'Alembert's solution; applications to light and sound.

[Laplace's equation:] steady state heat flow; cylindrically symmetric solutions and Bessel functions; spherically symmetric solutions and Legendre functions; flow in porous media.

[Diffusion equation:] Derivation of heat/diffusion equations in one dimension; relation to Brownian motion (random walk) in two and three dimensions; application to chemical diffusion; solutions by separation of variables.

[First order PDEs:] Linear and quasilinear first order partial differential equations; characteristics; applications in chromatography, glacial flow, sedimentation; breaking waves and shocks; diffusion and dispersion (Burger's and KdV equations).

**Prerequisites:** MS4403

### **MS4014 - INTRODUCTION TO NUMERICAL ANALYSIS**

**ECTS Credits:** 6 (Year 2 Module)

#### **Mathematics & Statistics**

**Rationale and Purpose of the Module:** *This module provides an introduction to the basic concepts of numerical analysis.*

**Syllabus:** Propagation of floating point error;

Zeroes of nonlinear functions: Bisection method, Newton/Raphson method, Secant method, fixed point method; convergence criteria, rate of convergence, effect of multiplicity of zero; introduction to the use of Newton/Raphson method for systems of nonlinear equations.

Systems of linear equations: Gauss elimination, LU and Cholesky factorisation, ill-conditioning, condition number; iterative methods: Jacobi, Gauss-Seidel, SOR, convergence criterion.

Interpolation and Quadrature: Lagrange interpolation, error formula;

Newton-Cotes and Romberg quadrature.

Numerical solution of ordinary differential equations: initial and boundary value problems, Runge Kutta and Adams Moulton methods, application to systems of ordinary differential equations.

**Prerequisites:** MS4022, MS4403

### **MS4034 - APPLIED DATA ANALYSIS**

**ECTS Credits:** 6 (Year 2 Module)

#### **Mathematics & Statistics**

**Rationale and Purpose of the Module:** *[Module replaces Numerical Computation MS4024]*

*This is a new module the aim of which is to give the students experience building and using statistical models to analyse real data and formulate conclusions based on interval estimates, hypothesis testing, model selection and comparison.*

*The module serves to integrate the practice and theory of statistics.*

*The instructor and students are expected to analyse the data provided with each lab in order to answer a scientific question posed by the original researchers who collected the data.*

*To answer a question, statistical methods are introduced, and the mathematical statistics underlying these methods are developed.*

**Syllabus:** Descriptive statistics; quantile plots, normal approximation.

Simple random sampling; confidence intervals. Stratified sampling; parametric bootstrap allocation.

Estimation and testing; goodness-of-fit tests, information, asymptotic variance.

Contingency tables; experimental design.  
Poisson counts and rates; Mantel-Haenszel test.

Regression; prediction, replicate measurements, transformations, inverse regression, weighted regression.

Multiple linear regression; model checking, projections.

Analysis of variance; unbalanced designs, indicator variables, factorial designs.

*Prerequisites:* MS4222

#### **MS4414 - THEORETICAL MECHANICS**

*ECTS Credits: 6 (Year 2 Module)*

##### **Mathematics & Statistics**

**Rationale and Purpose of the Module:** *To introduce students to the fundamental concepts of theoretical mechanics.*

*To prepare students by developing the basic mathematical skills in theoretical mechanics.*

*To emphasise applications of vector calculus and ODEs.*

**Syllabus:** Kinematics: reference frames, motion in one dimension, motion with constant acceleration, kinematics in three dimensions, uniform circular motion, centripetal acceleration

Dynamics: mass, force, NewtonÆs laws of motion, friction, Newton's Law of Gravity, planetary motion

Conservation laws: momentum, angular momentum, energy (kinetic energy, potential energy as gradient of force)

Oscillatory motion: free and forced pendulum, resonance, parametric resonance

Introduction to the Hamiltonian and Lagrangian mechanics

*Prerequisites:* MS4403, MS4613

## **Mathematics & Statistics Year 3 Modules**

#### **MA4006 - ENGINEERING MATHEMATICS 5**

*ECTS Credits: 6 (Year 3 Module)*

##### **Mathematics & Statistics**

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

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

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

*Prerequisites:* MA4003

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

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

*Prerequisites:* EC4307, MA4125

#### **MA4708 - QUALITY CONTROL**

*ECTS Credits: 6 (Year 4 Module)*

##### **Mathematics & Statistics**

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

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

*Prerequisites:* MA4707

## **Mathematics & Statistics Year 4 Modules**

#### **MA4128 - ADVANCED DATA MODELLING**

*ECTS Credits: 6 (Year 4 Module)*

##### **Mathematics & Statistics**

**Rationale and Purpose of the Module:** *To ground the students in Applied Multivariate Analysis. The module*

**MB4018 - DIFFERENTIAL EQUATIONS***ECTS Credits: 6 (Year 4 Module)***Mathematics & Statistics**

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

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

*Prerequisites: MA4702***MS4018 - DYNAMICAL SYSTEMS***ECTS Credits: 6 (Year 4 Module)***Mathematics & Statistics**

**Rationale and Purpose of the Module:** *To demonstrate to the student how dynamical techniques can be applied to the analysis of nonlinear and chaotic models, data and systems.*

**Syllabus:** One dimensional flows: flows on the line, fixed points and stability; bifurcations, flows on the circle.

Two dimensional flows: Linear systems, classification of fixed points; phase plane, linearisation, stability and Lyapunov functions. Limit cycles, oscillators. Bifurcations in the plane, Hopf bifurcations, global bifurcations of cycles, quasi-periodicity. Poincare maps.

Chaos : Lorenz equations; strange attractors; control of chaos.

One dimensional maps : fixed points, periodic points and stability; bifurcations, the logistic map -- numerics and analysis, period-doubling and intermittency; Lyapunov exponents, renormalisation and Feigenbaum numbers.

Introduction to time series applications.

Fractals : dimensions; strange attractors revisited.

*Prerequisites: MS4403***MS4028 - STOCHASTIC DIFFERENTIAL EQUATIONS FOR FINANCE***ECTS Credits: 6 (Year 4 Module)***Mathematics & Statistics**

**Rationale and Purpose of the Module:** *Methods of stochastic dynamics applied to finance, and with reference to problems involving stochastic differential equations from physics and engineering.*

**Syllabus:** Introduction to Monte Carlo simulation: Numerical simulation of paths; ensemble averaging and connections to partial differential equations. Examples from Finance and Physics. Stochastic differential equations and Langevin equations. Fokker-Planck/Kolmogorov equation and relation to Black-Scholes equation. Numerical methods for SDEs and Langevin equations: Euler-Maryuma method and higher-order schemes. Pricing barrier options and first-passage problems, including multiple stochastic factors.

Trinomial trees and finite difference methods: Pricing on trinomial trees. Analytical methods for partial differential equations. Explicit, implicit, Crank-Nicholson, and ADI implementations for numerical solution of partial differential equations, including options on multiple assets.

Modelling markets with stochastic differential equations: Comparison of modelling methods for stochastic dynamics problems in Finance, Physics, and Engineering. The Ito/Stratonovich dilemma. Non-Gaussian distributions and fat tails in the markets. Long-memory effects. Coloured noise and the Ornstein Uhlenbeck

process. Autocorrelation functions and spectra of noise sources. Wiener-Khinchin theorem.

*Prerequisites: MS4213, MS4217***MS4218 - TIME SERIES ANALYSIS***ECTS Credits: 6 (Year 4 Module)***Mathematics & Statistics**

**Rationale and Purpose of the Module:** *This course introduces students to the statistical basis behind model identification, model fitting and model criticism of time series probability models in both time and frequency domains.*

**Syllabus:** Components of a time series; smoothing methods; trend projection; deseasonalising a time series, autocorrelation; autoregressive models; integrated models; estimation in the time domain; the Box-Jenkins approach; spectral analysis, the spectral distribution function, the spectral density function, Fourier analysis, periodogram analysis, the fast Fourier transform; forecasting methods, extrapolation, Holt-Winters, Box-Jenkins, prediction theory; bivariate processes, the cross-correlation function, the cross-spectrum; applied time series analysis using suitable software packages.

**MS4327 - OPTIMISATION***ECTS Credits: 6 (Year 4 Module)***Mathematics & Statistics**

**Rationale and Purpose of the Module:** *To give students a broad understanding of the theoretical and numerical aspects of non-linear optimisation*

**Syllabus:** Criteria for Optimality. Conditions for linear equality- and inequality-constrained problems. First-order and second-order Karush-Kuhn-Tucker (KKT)

conditions for general non-linearly constrained problems.

Unconstrained Optimisation. Univariate Functions: Line Searches.

Multivariate Functions: Steepest Descent and Newton's Method,

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

Conjugate Gradient Methods.

Constrained Optimisation. Penalty and Barrier Function Methods.

Computational limitations of penalty function methods - ill-conditioning. Exact Penalty Function Methods.

The module will include at least one computer-based project requiring students to select and implement a suitable algorithm for the solution of a non-trivial optimisation problem using either Fortran or Matlab.

#### **MS4408 - MATHEMATICAL MODELLING**

ECTS Credits: 6 (Year 4 Module)

##### **Mathematics & Statistics**

**Rationale and Purpose of the Module:** To learn the techniques of advanced mathematical modeling or real phenomena with examples from the physical, biological, chemical and financial sciences.

**Syllabus:** Review of modelling skills, applications from: classical models (e.g. heat transfer), continuum models , financial models, statistical models, mathematical biology, advanced models.

Prerequisites: MS4404, MS4407, MS4403

#### **MS4528 - MATHEMATICAL AND STATISTICAL MODELS OF INVESTMENTS**

ECTS Credits: 6 (Year 4 Module)

##### **Mathematics & Statistics**

**Rationale and Purpose of the Module:** *The aim of this module is to equip the student with the necessary analytical and quantitative skills required for the pricing and hedging of contingent claims, as well as of interest rate products, credit default swaps, and analyze the risk and return of individual assets and portfolios.*

**Syllabus:** &bull; The Black-Scholes Model as a limit of the Binomial Model. Definition and Properties of Brownian motion. Stochastic Integration, Ito Calculus and Stochastic Differential Equations for continuous-time models in finance. Option pricing and hedging in the Black-Scholes model. &bull; Fixed Income securities and interest rate derivatives, including Swaps, Caps, Floors, and Black's Formula. &bull; Credit risk and Credit derivatives such as Credit default swaps, Collateralised debt obligations. Credit spreads, implied default probabilities and the pricing of simple derivatives. &bull; What is volatility? Black-Scholes implied volatilities, realized volatilities, Volatility Swaps. Time Series models for volatility estimation and forecasting (e.g. using GARCH). &bull; Portfolio optimization with the Markowitz approach. The Capital Asset Pricing Model.

## **Department of Physics Year 1 Modules**

#### **PH4012 - PHYSICS FOR ENGINEERS 2**

ECTS Credits: 6 (Year 1 Module)

##### **Physics**

**Rationale and Purpose of the Module:** Continuation of an introductory course in physics (PH4011) for engineering students.

**Syllabus:** Properties of Matter: Elastic and thermal properties of solids: stress and strain, thermal expansion, Hooke's law, Young's modulus, shear modulus, bulk modulus. Fluid mechanics: pressure, variation of pressure with depth, pressure measurements. Buoyant forces and Archimedes' principle. Fluid dynamics: Bernoulli's equation, other applications of fluid dynamics. Heat: The kinetic theory of gases: molecular model of an ideal gas, non-ideal gases, equipartition of energy. Heat transfer: conduction, convection and radiation. Oscillations and simple harmonic motion: transverse and longitudinal waves, superposition, speed, reflection, harmonic waves; sound waves, sound intensity, Doppler effect. Light: EM Spectrum, Sources of light; Geometrical optics, reflection, refraction, dispersion, achromatic optics; Physical optics, interference; diffraction; diffraction gratings; polarisation; Optical systems, the microscope, the telescope, the eye.

Prerequisites: PH4011

#### **PH4032 - PHYSICS FOR GENERAL SCIENCE 2**

ECTS Credits: 6 (Year 1 Module)

##### **Physics**

**Rationale and Purpose of the Module:** To introduce the student to general wave motion, optics and acoustics. To introduce the student to the mechanical and thermal properties of matter.

**Syllabus:** Review of the basic concepts of force and energy. Oscillations and simple harmonic motion: transverse and longitudinal waves, superposition, speed, reflection, harmonic waves, sound waves, sound intensity, Doppler effect. Light: EM spectrum, sources of light, Geometrical optics, reflection, refraction, dispersion, achromatic optics. Physical optics: interference, diffraction, diffraction gratings, polarisation. Optical systems: the microscope, the telescope, the eye. Elasticity: Hooke's law. Fluids. Heat: temperature, laws of thermodynamics, heat capacities. Heat transfer: conduction, convection and radiation. Kinetic theory, the ideal gas. Heat engines.

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**PH4042 - THERMAL PHYSICS**  
*ECTS Credits: 6 (Year 1 Module)*
**Physics**

**Rationale and Purpose of the Module:** *The purpose of this module is to enhance students' understanding of key concepts and models associated with thermal physics. The objectives are to first present a general thermodynamics framework, then to introduce statistical concepts followed by analysis of specific physical models.*

**Syllabus:** Temperature: thermal equilibrium; the zeroth law; equations of state; temperature scales. [First law of thermodynamics]: internal energy; heat and heat capacity; reversible processes and work; free expansion and Joules law. [Second law of thermodynamics]: Carnot cycles, efficiency; thermodynamic temperature scale. [Entropy]: Clausius inequality and entropy; principle of increasing entropy; central equation of thermodynamics; entropy of an ideal gas. [Thermodynamic potentials and Maxwell relations]: internal energy U; enthalpy H; Helmholtz free energy F; Gibbs free energy G; energy equations; availability A and useful work; mechanical, magnetic & electrolytic systems. [Change of phase]: chemical potential; Clausius-Clapeyron equation; nucleation; Gibbs phase rule. [Microstates and macrostates]: statistical weight of a macrostate; Boltzmann definition of entropy; entropy and disorder. [Equilibrium of an isolated system]: magnetic dipole lattice; Schottky defects. [Equilibrium of a system in a heat bath]: the partition function and the Boltzmann distribution; equivalence of thermodynamic and statistical quantities; the classical gas; heat capacities of solids; perfect quantal gas; Planck's law; thermodynamics of black body radiation. [Equilibrium of a system with variable particle number]: Gibbs distribution; Fermi-Dirac and Bose-Einstein distributions; Bose-Einstein condensation; Fermi energy; density of states; electrons in metals.

*Prerequisites:* PH4131

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**PH4062 - NANOTECHNOLOGY 2**  
*ECTS Credits: 6 (Year 1 Module)*
**Physics**

**Rationale and Purpose of the Module:** *The purpose of this module is to enhance the students' understanding of key concepts of mechanics, optical and electronic transport properties of nanostructured materials and to develop an understanding of the importance of mechanical and electro-optical properties in applications of nanostructured materials.*

**Syllabus:** Nanotribology and Materials Characterization Studies Using Scanning Probe Microscopy: Description of AFM/FFM, Friction and Adhesion, Scratching, Indentation and wear, Phase, electrostatic and related scanning probe microscopies. Surface Forces: Types of Surface Forces; Methods Used to Study Surface Forces; Adhesion and Capillary Forces; Different Modes of Friction and the Limits of Continuum Models. Friction and Wear on the Atomic Scale: Friction Force Microscopy in Ultra-High Vacuum, The Tomlinson Model, Friction Experiments on Atomic Scale, Thermal Effects on Atomic Friction, Geometry Effects in Nanocontacts. Nanomechanical Properties of Solid Surfaces and Thin Films: Modes of Deformation, Thin Films and Multilayers. Mechanics of Biological Nanotechnology: Scales at the Bio-Nano Interface, Viruses as a Case Study. Optical Properties of Nanostructures: Collective oscillation (Gustav-Mie explanation), surface plasmon polaritons, subwavelength optics, nonlinear optical properties, Electron Transport in Nanostructures: Electronic transport in nanostructures, density of states in nanocrystals. Electronic Nanodevices: Quantization of resistance, single-electron transistors, resonant tunnelling diodes, organic molecular electronics. Magnetic Nanodevices: Spintronics. Photonic Nanostructures: Photonic crystals, metamaterials, disordered photonic media.

*Prerequisites:* PH4081

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**PH4072 - ELECTROMAGNETISM**  
*ECTS Credits: 6 (Year 1 Module)*
**Physics**

**Rationale and Purpose of the Module:** *The purpose of this module is to enhance students' understanding of key concepts associated with electromagnetism. The objectives are to first present a general vector analysis, then to introduce electric and magnetic field concepts followed by analysis of specific physical problems using*

*vector calculus. Secondly, the students will be introduced to the fundamental properties of electric and magnetic materials. The final objective is to introduce the students to the unified theory of electromagnetic waves and its application in matters and simple physical systems.*

**Syllabus:** Vector methods: div, grad, curl; line, surface and volume integrals; Electric field E: electric charge, Coulombs law, electric field E, Gauss law, divergence of electric field, the Dirac delta function; Magnetic field: magnetic field B, Biot-Savart law, Amperes law, Lorentz force; Electromagnetic induction: emf, Faradays law, generators and motors; Maxwells equations in vacuum: integral and differential form, monopoles; Energy and potential: energy density in E and B fields, scalar potential V and vector potential A; Dipoles and multipoles: electric dipole p, magnetic dipole m, electric multipoles; Conductors: conductivity, Ohms law, Hall effect; Dielectrics: polarisation P, displacement D, permittivity, electric susceptibility, dielectric constant; Magnetic materials: diamagnets, paramagnets, ferromagnets; magnetic intensity H, magnetisation M, magnetic susceptibility, inductance, transformers; Maxwells equations in matter: Maxwells equations in terms of H and D; Boundary value problems: Poissons equation, Laplaces equation, uniqueness theorem, images; Circuits: transients, reactance, power, and impedance.

*Prerequisites:* PH4131

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**PH4092 - SEMICONDUCTOR DEVICES**  
*ECTS Credits: 6 (Year 1 Module)*
**Physics**

**Rationale and Purpose of the Module:** *To introduce the student to the physics of solid state electronic devices and to their application*

*To introduce the student to semiconductor devices, electronic logic and digital devices*

**Syllabus:** Conduction in solids: elementary band theory of conductors, semiconductors and insulators, doping; donor and acceptor impurities, intrinsic and extrinsic conduction, majority and minority charge carriers. The PN junction: junction diode and applications, Zener diode, the bipolar transistor; transistor action, applications the emitter amplifier, early effect; the field

effect transistor, JFET, MOSFET, characteristics and application in simple circuits. Combinational Logic: Binary Logic, Logic functions; AND, OR, NOT; Truth table; Boolean Algebra; Boole Boolean postulates and theorems, De Morgan; Logic gates - complete set; NAND and NOR implementations of logic functions; Multiple-input gates. Sequential Logic: Memory, feedback, synchronous/asynchronous, Flip-flops, Latches; basic SR latch, gated SR Latch, D-type, Master-slave latch, JK Latch; Shift Registers, Counters, UART (block diagram). Operational and Instrumentation amplifiers: desirable characteristics, comparators, voltage reference, virtual earth, voltage follower, NyquistShannon sampling theorem.

**Prerequisites:** PH4131

## PH4102 - WAVES/LIGHT/MODERN PHYSICS

*ECTS Credits: 6 (Year 1 Module)*

### Physics

**Rationale and Purpose of the Module:** To introduce the student to general wave motion, optics and acoustics and to provide the student with a general introduction to special relativity and to atomic and nuclear physics.

**Syllabus:** Oscillations and simple harmonic motion: transverse and longitudinal waves, superposition, speed, reflection, harmonic waves. Sound: sound waves, sound intensity, Doppler effect. Light: EM Spectrum, Sources of light, Geometrical optics; reflection, refraction, dispersion, achromatic optics; Physical optics; interference, diffraction, diffraction gratings, polarisation; Optical systems; the microscope, the telescope, the eye. Special Relativity: Einstein's Postulates, time dilation, length contraction, the Lorentz Transformation, relativistic momentum and energy conservation. Atom: Classical models, Planck's quantum hypothesis, the Bohr atom, The photoelectric effect; quantized energy; the de Broglie wavelength. The nucleus: nucleons; isotopes; nuclear structure; binding energy. Radiation: X rays, alpha, beta and gamma radiation, the law of radioactive decay. fission and fusion; nuclear reactors. Detection, dosage.

**Prerequisites:** PH4131

## PH4111 - SEMICONDUCTORS 2

*ECTS Credits: 6 (Year 1 Module)*

### Physics

**Rationale and Purpose of the Module:** The purpose of the module is introduce advanced CMOS process technology and the problems associated with device fabrication as the technology moves towards 30 nm features and below.

**Syllabus:** CMOS process flow: CMOS fabrication steps, active region formation, shallow trench isolation, n and p well formation. Gate formation: threshold voltage, control of V<sub>th</sub> in n and p channel MOS devices, tip or LDD formation (hot electrons), side wall spacer. Source and drain formation: contact and interconnect formation, multilevel metal formation for ULSI, RC time delay. Surface contaminants: particles, metallic contaminants, organic contaminants, native/chemical oxide, moisture. Cleaning processes: surface characteristics, wet cleaning, dry cleaning, supercritical fluid cleaning, lamp cleaning-surface refreshing. Cleaning /Etching Chemistries]: contamination reduction, gettering (intrinsic and extrinsic). Chemical Mechanical Polishing (CMP): SiO<sub>2</sub> inter-level dielectric layers planarisation, tungsten plug formation and shallow trench isolation. Dual Damascene: trench first approach, via first approach, optical proximity correction. High and low K dielectrics: silicon on insulator, ultra thin oxides, gate dielectrics, degradation mechanisms, nitroxides, fluorinated oxides, shallow junction formation, transient enhanced diffusion. Electrstatic discharge (ESD): basics of ESD, principles of ESD control. Semiconductor Metrology: CD and overlay measurements, electrical and optical measurements. Assembly: frontend assembly, backend assembly. Semiconductor failure analysis: implant metrology, interconnect process metrology, ellipsometry, reflectometry, sheet resistance measurements.

**Prerequisites:** PH4071, PH4805

## PH4132 - MODERN PHYSICS

*ECTS Credits: 6 (Year 1 Module)*

### Physics

**Rationale and Purpose of the Module:** This module will develop the student's understanding of fundamental concepts and ideas in modern physics, specifically the use and application of the Schroedinger equation, and the principles of special relativity.

**Syllabus:** Wave mechanics: De Broglie's hypothesis, wave functions and probability amplitudes, the Heisenberg Uncertainty principle. The Schrödinger wave equation: simple solutions in one dimension, transmission, reflection and penetration at a barrier, tunnelling, potential wells, the harmonic oscillator. The Schrödinger equation in three dimensions: the hydrogen atom, quantisation of angular momentum, spatial quantisation, the Zeeman effect. Spin: the fourth quantum number, the Pauli exclusion principle.

Special Relativity: Relativistic dynamics, relativistic mass and momentum, total energy, mass/energy equivalence. Spacetime: spacetime diagrams, introduction to four-vectors. Application of relativistic dynamics to particle beam devices and collision experiments.

Nuclear Physics: Nucleons and nuclear models, nuclear spin nuclear reactions and cross-sections. Introduction to elementary particles and the Standard Model.

**Prerequisites:** PH4102

## PH4142 - INTRODUCTION TO PHYSICS

*ECTS Credits: 6 (Year 1 Module)*

### Physics

**Rationale and Purpose of the Module:** Physics is a fundamental discipline for all Science & Engineering students.

*Studying physics helps teach students how to think rationally and logically, how to interpret the physical world around them, and how to quantitatively assess and predict what happens in the world using the tools of mathematics to do so.*

*The specific purpose of Introduction to Physics is to introduce students to the basic principles of*

*measurement, mechanics, heat, fluids, waves and optics. The aim is teach students how to understand the relationship of these principles to the real world and through rational thought use this understanding to interpret, solve physical problems and question the meaning of their solutions.*

**Syllabus:** Measurement and units: The SI system, basic and derived.

Mechanics: Displacement, velocity, acceleration, Newton's laws of motion, force, mass, momentum, work, energy, power.

Heat: Temperature, calorimetry, specific heat capacity, latent heat, heat transfer, thermal conductivity.

Optics: Geometrical optics, properties of optics, reflection, laws of reflection, refraction, laws of refraction, mirrors, lenses, total internal reflection, critical angle, optical instruments.

Waves: Properties of waves, wave nature of light, Huygen's principle, double-slit experiment, diffraction, interference, diffraction gratings, polarization of light, the electromagnetic spectrum, ultraviolet, visible light, x-rays, -ray, infrared radiation.

#### Department of Physics Year 4 Modules

##### PH4018 - MEDICAL INSTRUMENTATION

ECTS Credits: 6 (Year 4)

##### Physics

**Rationale and Purpose of the Module:** \* To introduce the special considerations for electric/electronic instruments attached to patients for the purposes of diagnosis or therapy.

\* To introduce the medical device directive and the regulatory environment.

\* To give the student a working knowledge of the operation of some medical equipment

\* To introduce the student to the scientific basis of the well known radiological equipment commonly in use in our hospitals and medical research institutes.

\* To provide a working knowledge of the operation of this equipment.

**Syllabus:** Introduction to regulatory bodies in the EU and US: CE, FDA etc.; 21 CFR, 510k, Medical Device Directive, Investigational Device Exemptions; Electrical isolation standards, implementation options; Laser

Safety - EN 60825. Measurements in biological systems: obtaining a reference, ratiometric analysis, clinical requirements,

Physiological monitoring; Invasive/non-invasive, Probes - Electrical, fibre optic, non-contact. Vital signs monitoring: ECG- Electro cardio gram, electrical function of the heart; EEG- Electro encephalo gram, electrical function of the brain; EMG- Electro myelo gram, electrical function of the muscle; Pulse Oximetry, optical measurement of arterial blood oxygen saturation; MAP- mean arterial pressure. Introduction to radiation transport in tissue: absorption/scattering theory (Mie, Rayleigh Gans), bulk scattering and bulk absorption, anisotropy, typical values for radiation transport properties, Monte Carlo modelling. X-RAY/CT: X-RAY generation and propagation, Introduction to tomography, Computed Tomography - Slicing the living human body. Ultrasound: Doppler effect, high frequency ultrasound, limitations.

MRI/MRS: Magnetic Resonance basics, the hydrogen nucleus, proton spin and quantum mechanics; 3D map of hydrogen atoms and hence content of the sample volume, Properties and amount of water in tissue, distinction between contrast and content imaging.

##### PH4608 - SOLID STATE PHYSICS 2

ECTS Credits: 6 (Year 4 Module)

##### 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, magnetism, superconductivity and low dimensional systems.

**Syllabus:** Magnetism: paramagnetism, diamagnetism, exchange interaction and ferromagnetism, Weiss model of ferromagnetism, Neel model of antiferromagnetism, domains and Bloch walls, giant magnetoresistance.

Insulators: dielectrics and susceptibility, pyroelectrics, ferroelectrics and piezoelectrics. Quantum transport: ballistic transport, tunnelling and Coulomb blockade. Low dimensional systems: two dimensional electron/phonon gas, density of states, quantum Hall effect.

Superconductivity: Type-1 and Type-2 superconductors, magnetic properties, thermodynamics of superconducting

transition, London equations, energy gap and Cooper pairs, tunnel junctions and Josephson effect.

**Prerequisites:** PH4607

## School of Design Year 1 Modules

### AR4002 - DESIGN STUDIO 1B – \*\*\*ONLY OPEN TO ARCHITECTURAL STUDENTS\*\*\*

ECTS Credits: 15 (Year 1 Module)

##### School of Design

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

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

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

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

Each project also introduces a new programmatic theme so that students understand and become conversant with the many fields of operation of an architect. Themes include space and light explorations through model

making, understanding the process of abstraction and transformation through model making/two dimensional work, building full scale structures in timber to explore architectural concepts such as scale, framing, section and thresholds, developing observational skills through sketching on site, learning how to make a site plan by developing a pattern of occupation on an open site, learning how to develop a building design grounded in this context.

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

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

*Prerequisites:* AR4001

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#### **AR4012 - GRAVITY AND REACTION 2- \*\*\*ONLY OPEN TO ARCHITECTURAL STUDENTS\*\*\***

*ECTS Credits:* 3 (Year 1 Module)

#### **School of Design**

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

**Syllabus:** Continued Introduction to structural concepts. Topics covered will be Pin jointed frames, Parallel chord cantilever truss multiple point load. Parallel chord cantilever truss: uniformly distributed load Pitched roof truss, Internal Forces in Beams, Axial, shear bending definitions, corresponding internal stress states,

simplified models of stress states. End load cantilever with uniformly distributed load, Simply Supported Beam: mid-span point load with deflection, Simply Supported Beam: 2 point loads, Simply Supported Beam: uniformly distributed load with deflection, Supported Beam: partial uniformly distributed load, 3 Pin frame with vertical point load, 3 Pin frame with horizontal point load., 3 Pin frame with uniformly distributed load, Qualitative analysis: Frames, deflected shapes, tension zones in bending, axial force, shear force. Students will Construct:  
 (a)\* A cantilever truss with 1.0kg point load and a slender braced bottom chord. 1.0m long 200mm deep (2 groups).  
 (b)\* A simply supported beam and a fixed ended beam (same section) with mid span point loads 1.0kg approx.  
 \* Measure deflections (2 groups).  
 (c)\* A cantilever beam 1.0m long with a 1.0kg end point load. A cantilever beam (same section) 2.0m long with a 1.0kg end point load measure deflections (1 group).

*Prerequisites:* AR4011

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#### **AR4022 - REPRESENTATION / DRAWING 2- \*\*\*ONLY OPEN TO ARCHITECTURAL STUDENTS\*\*\***

*ECTS Credits:* 3 (Year 1 Module)

#### **School of Design**

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:

Studio based exercises will, by degrees shift their focus from training the craft of technique in drawing toward using drawing as an analytical and representation technique. Colour, composition, documentation of different sites û with some visits to specific sites - , typography and basics of graphic design will be subjects of the course. Ink and pastels will be introduced as drawing materials, wood, plexiglas and metals as model making materials.

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

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

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#### **AR4032 - HISTORY AND THEORY OF ARCHITECTURE 2**

*ECTS Credits:* 3 (Year 1 Module)

#### **School of Design**

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

**Syllabus:** The theme for the spring workshop is Building. Just as students need to learn to describe a site and objectify their reactions to it, as architects it is essential that they also learn to discuss buildings at a high level. Seminars will address Skin, Program, Circulation, Structure, and Codes, introducing both historical and contemporary material to challenge students. Throughout, students will explore architecture's intersection with the material and social realms. As in the first semester, students will undertake close readings of the most significant works in modern and contemporary architecture. Projects likely to be discussed will include Joseph Paxton's Crystal Palace, Otto Wagner's Postsparkasse, Mies van der Rohe's 860-880 Lake Shore Drive and Seagram Buildings, Le Corbusier's La Tourette, Eero Saarinen's IBM Headquarters, Bernard Tschumi's Parc de la Villette, FOA's Yokohama Terminal, MVRDV's WoZoCos Housing Project. Readings by authors such as Robin Evans, Colin Rowe, Anthony Vidler, Otto Wagner, Alan Colquhoun, Le Corbusier, and

Walter Gropius will explore the diverse ways by which buildings can be discussed. We will visit nearby sites first-hand in order to learn how to read buildings. Afternoon workshops will focus on describing these sites. The writing projects introduced in the fall semester will be built upon in order to ensure that students have a high degree of skill in thinking about architecture through writing by the end of the term. This course will be teamed with a series of workshops by Elizabeth Hatz that will introduce students to ways of attaining close readings of buildings through drawing.

*Prerequisites:* AR4031

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**AR4042 - ASSEMBLY AND TECHNIQUES 2-  
\*\*\*ONLY OPEN TO ARCHITECTURAL STUDENTS\*\*\***

*ECTS Credits:* 3 (Year 1 Module)

**School of Design**

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

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

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**AR4052 - ENVIRONMENTAL SYSTEMS AND FORCES  
2- \*\*\*ONLY OPEN TO ARCHITECTURAL STUDENTS\*\*\***

*ECTS Credits:* 3 (Year 1 Module)

**School of Design**

**Rationale and Purpose of the Module:** *Continuation of first term's work, to give students a basic understanding of physical backgrounds and interconnections for a sustainable development*

**Syllabus:** Sustainable development is a base for the future of human society on our planet. Architects as the designer for the built environment have a key position in this approach. Therefore a basic understanding of the physical backgrounds and interconnections is necessary. This lecture content spans from global to local and micro climate, to energy and its different forms and sources towards materials and their properties. Parallel and interconnected to the teaching of design basics like space, light, boundaries students will learn the physical backgrounds and properties by handling and personal experiences. ôBurning your finger at a hot stainless steel surface while missing the heat radiation ú and understand why this happened - is a much deeper experience, than just calculating heat conductivity on a piece of paper.ö

*Prerequisites:* AR4051

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## School of Design Year 2 Modules

**AR4004 - DESIGN STUDIO 2B- \*\*\*ONLY OPEN TO ARCHITECTURAL STUDENTS\*\*\***

*ECTS Credits:* 15 (Year 2 Module)

**School of Design**

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

- \* Spatial model study of housing in a specific cultural context.
- \* Aspects to be studied: spatial relation to land, territory, climate, privacy, social interaction, interior spatial organisations

-\* Means of study: intuitive and structured modelling in mix, studies in situ and sketching

-\* histories, characteristics, contemporary situations, investigations through site visits, lectures, mapping, free sketching, birds eye perspectives\*

û\* Land, structure, climate and materials:

û\* a. Spatial logistics and spatial politics. Geometry and human occasion. Types, patterns, and spatial logistics: The maisonette, the dwelling unit, patterns of repetition, link to Irish house and housing traditions.

û\* b. Reconstructing Space. Parallel to first year program: Drawing of works by various architects

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

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

*Prerequisites:* AR4003

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**AR4014 - GRAVITY AND REACTION 4- \*\*\*ONLY OPEN TO ARCHITECTURAL STUDENTS\*\*\***

*ECTS Credits:* 3 (Year 2 Module)

**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:

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

**Prerequisites:** AR4013

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**AR4024 - REPRESENTATION / DRAWING 4-  
\*\*\*ONLY OPEN TO ARCHITECTURAL STUDENTS\*\*\***

**ECTS Credits:** 3 (Year 2 Module)

**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:** AR4023

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**AR4034 - HISTORY AND THEORY OF  
ARCHITECTURE 4**

**ECTS Credits:** 3 (Year 2 Module)

**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. In the second semester students will continue to hone the specific cognitive skills required to address the field, deepening their knowledge of the local and global built domain while reading, writing, and researching architecture. The second year program revolves around intensive workshops and seminars.*

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

**Prerequisites:** AR4033

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**AR4044 - MATERIALS 1- \*\*\*ONLY OPEN TO  
ARCHITECTURAL STUDENTS\*\*\***

**ECTS Credits:** 3 (Year 2 Module)

**School of Design**

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

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

Studio exercises are construction based project work, build a skin for 1m space out of different materials, one from each group, understanding the characteristics by touching and assembling different materials, analysing the models.

There is a lecture series from external architects and artists known for dealing with one specific material, fabrics, wooden constructions.

Second block: Lectures with focus on the physical characteristics of materials, together with a review of the research results of the students so far.

Exercise: Material tests of samples in respect of light, heat, and other physical stresses

Third block: Lectures with focus on assembling techniques of different materials

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**AR4054 - ENVIRONMENTAL SYSTEMS AND FORCES  
4- \*\*\*ONLY OPEN TO ARCHITECTURAL  
STUDENTS\*\*\***

**ECTS Credits:** 3 (Year 2 Module)

**School of Design**

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

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

**Prerequisites:** AR4053

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## **School of Design Year 3 Modules**

**AR4006 - DESIGN STUDIO 3B- \*\*\*ONLY OPEN TO  
ARCHITECTURAL STUDENTS\*\*\***

**ECTS Credits:** 15 (Year 3 Module)

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

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

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

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

Prerequisites: AR4005

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#### **AR4016 - GRAVITY AND REACTION 6- \*\*\*ONLY OPEN TO ARCHITECTURAL STUDENTS\*\*\***

ECTS Credits: 3 (Year 3 Module)

#### **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 will be studied directly in the laboratory will be portal frames, crane structure; Introduction to materials

used in structural design; concrete, reinforced concrete; timber; laminated timber; glulaminated timber; steel; models to describe failure modes in structures. Students will research:

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

Prerequisites: AR4015

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#### **AR4026 - REPRESENTATION / DRAWING 6- \*\*\*ONLY OPEN TO ARCHITECTURAL STUDENTS\*\*\***

ECTS Credits: 3 (Year 3 Module)

#### **School of Design**

**Rationale and Purpose of the Module:** In this module students develop skills in 3-dimensional modelling using the computer, in conjunction with continuing studies in physical modelling. Switching between digital and analogue modes of representation, e.g. models, drawings, digital photography, FormZ, Rhino, and SketchUP, programmes will be explored as tools of transformation and spatial, logical, and structural exploration.

#### **Syllabus:**

Widening the pallet of modes of representation that the student must master, 3-dimensional modelling is taught as a tool of spatial investigation and representation, this course consists of three different types of drawing exercises:

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

Prerequisites: AR4025

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#### **AR4036 - HISTORY AND THEORY OF ARCHITECTURE 6- \*\*\*ONLY OPEN TO ARCHITECTURAL STUDENTS\*\*\***

ECTS Credits: 3 (Year 3 Module)

#### **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 urban history.

**Syllabus:** Through lectures, discussion seminars, field trips, and writing the course will survey urban history from prehistory to the present day. The course is a broad introduction to urbanism throughout the ages, from the Paleolithic to the present day both in critical texts and first hand. Students will be exposed to the complexity of collective human inhabitations throughout the ages, both in Ireland and abroad.

Prerequisites: AR4032

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#### **AR4046 - ASSEMBLY AND TECHNIQUES 5- \*\*\*ONLY OPEN TO ARCHITECTURAL STUDENTS\*\*\***

ECTS Credits: 3 (Year 3 Module)

#### **School of Design**

**Rationale and Purpose of the Module:** The aims of this class are:

ü to introduce students to making a comprehensive set of working drawings of a third year design studio project.  
ü to develop further the student's own intuitive skills in technique alongside knowledge of available construction technology today.

ü to introduce students to the Irish Building Regulations  
ü to carry out a dissertation on a construction system of personal interest

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

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

**LECTURE COURSE:** A weekly lecture will introduce

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

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

**Prerequisites:** AR4043

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#### **AR4055 - CULTURE, PLACE AND ENVIRONMENT 1- \*\*\*ONLY OPEN TO ARCHITECTURAL STUDENTS\*\*\***

**ECTS Credits:** 3 (Year 3 Module)

#### **School of Design**

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

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

**Prerequisites:** AR4032

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## **School of Design Year 4 Modules**

#### **AR4008 - DESIGN STUDIO 4B- \*\*\*ONLY OPEN TO ARCHITECTURAL STUDENTS\*\*\***

**ECTS Credits:** 18 (Year 4 Module)

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

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

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#### **AR4058 - PROFESSION AND SOCIETY- \*\*\*ONLY OPEN TO ARCHITECTURAL STUDENTS\*\*\***

**ECTS Credits:** 3 (Year 4 Module)

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#### **School of Design**

#### **AR4068 - ADVANCED CONSTRUCTION 2**

**ECTS Credits:** 3 (Year 4 Module)

#### **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:** Architecture students learn best by imagining, developing and realising (fullscale) prototype structures through which ideas can be tested, documented and communicated.

Through actual engagement in all the stages of making and building, students have a unique opportunity to develop a rich phenomenal understanding of architecture. Closely related to Design Studio, Advanced Construction informs and supports the students individual design studio projects; directed and independent research on advanced construction is applied to these projects.

Students test radical and experimental alternatives to the conventional processes of building because architecture is facing unprecedeted pressure to reinvent itself in response to a new set of economic and environmental realities. The responsibility to preempt the needs of future built environments demands new approaches. The modules provide an overview of advanced building construction at an industrial scale and with respect to contemporary, emerging and innovative technologies. Students study the design implications of new construction technologies, and investigate precedents and potential applications.

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#### **AR4367 - Digital Technology- \*\*\*ONLY OPEN TO ARCHITECTURAL STUDENTS\*\*\***

**ECTS Credits:** 6 (Year 4 Module)

### 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 (shortterm) research projects within architecture, and to allow students to pursue their own personal interests within architecture. Smaller classes allow for in-depth interrogation of the subject at an advanced level.

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

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

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 surfaces 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.

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### AR4407 - ARCHITECTURE INTELLIGENCE UNIT- \*\*\*ONLY OPEN TO ARCHITECTURAL STUDENTS\*\*\*

**ECTS Credits:** 6 (Year 4 Module)

### 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 (shortterm) research projects within architecture, and to allow students to pursue their own personal interests within architecture. Smaller classes allow for in-depth interrogation of the subject at an advanced level.

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

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

As part of a university, IU offers an unbiased platform to allow a discussion and exploration with every interested

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

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## School of Engineering

### Year 1 Modules

#### AS2402 - INTRODUCTION TO ENGINEERING – PLEASE NOTE THIS MODULE IS TO BE CONFIRMED

**ECTS Credits:** 6 (Year 1 Module)

### School of Engineering

**Rationale and Purpose of the Module:** To understand the role of engineers in society and the different types of engineering.  
To understand the basic techniques of problem solving in engineering.  
To understand the basis of forces and moments in analysing structures  
To understand the basics of linear and angular motion when analysing dynamic problems

**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. Using a calculator correctly, Introduction to Engineering Units, Conversion Factors, Dimensional Consistency, Significant Numbers, Newtonian Mechanics, Forces, Vectors, Resolution of Forces, Moments of Forces, Free Body Diagrams, Reaction Forces, Linear Motion, Angular Motion, Mass, Weight, Momentum, Conservation of Energy

**Prerequisites:** AS2391

**CE4013 - STRUCTURAL ANALYSIS**

ECTS Credits: 6 (Year 1 Module)

**School of Engineering**

SI units and manipulation of formulae, sources and types structural loading, reactions and supports, free body diagrams, shear force and bending moment calculations, static determinacy and indeterminacy, qualitative analysis of beams and frames, stability and analysis of pin jointed frames, section properties, engineers equation of bending.

**CE4024 - STRUCTURAL STEEL AND TIMBER DESIGN**

**- PLEASE NOTE THIS MODULE IS TO BE CONFIRMED**

ECTS Credits: 6 (Year 1 Module)

**School of Engineering**

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

**Key objectives**

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

**Syllabus:**

\* Structural Steel  
Manufacture and composition û a review, section properties tables, design of fully restrained, partially restrained and un-restrained beams, truss design, design of long and short columns; axial and combined loading conditions, design of pinned and moment connections, baseplate and splice design, structural detailing and fire & durability issues.

**\* Timber Design**

Properties and conversion of timber û a review, beam design, column design; axial and combined loading conditions, truss design and stability issues, Introduction to diaphragm & shearwall design, bolted, nailed and

stapled connections, glulam, LVL and I-beam design, structural detailing and fire & durability issues.

Prerequisites: CE4002

**ID4112 - DESIGN MECHANICS**

ECTS Credits: 6 (Year 1 Module)

**School of Engineering**

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

**Syllabus:** Direct stress and strain. Stress and strain in compound bars. Buckling. Thermal stress. Shear stress. Torsion. Shear force diagrams. Bending moment diagrams. Bending stress. Stress concentration. Fatigue. Prime movers. Belt drives. Gears and gear trains. Bearings. Shafts and couplings.

**ME4042 - INTRODUCTION TO DESIGN FOR MANUFACTURE**

ECTS Credits: 6

**School of Engineering**

**Rationale and Purpose of the Module:** With the move to a general engineering common entry, this module will use the principles of Conceive, Design, Implement and Operate (CDIO) to help develop key engineering fundamentals.

The module will, through lecture, lab and group activity, provide the student with a basic knowledge and experience of the methods employed in the processing and fabrication of common engineering materials. The module will develop the students' communication, visualisation and collaborative capabilities. The module will emphasise the importance of safety in the engineering environment

**Syllabus:** Safety in the Laboratory. Fundamentals of

measurement and inspection. Process Capability, Quality and Accuracy.

Basic machining, cutting tool geometry and materials. Cutting speeds and feed rates. Fundamental treatment of the shear plane Workholding, positive and frictional restraint, degrees of freedom.

Joining - mechanical, manual metal arc welding, oxy-acetylene welding, adhesive bonding. Joint design. Engineering drawing - communication and visualisation. Technical sketching. Conventional representation; BS308.

Projection systems. Auxiliary views. Sections and sectional views, dimensioning. Detail and assembly drawings, surface intersections and developments. Limits and fits. BS4500.

**ME4412 - FLUID MECHANICS 1**

ECTS Credits: 6 (Year 1 Module)

**School of Engineering**

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

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

**WT4014 - INTRODUCTION TO GEOLOGY AND SOIL MECHANICS**

ECTS Credits: 6 (Year 1 Module)

**School of Engineering**

**Rationale and Purpose of the Module:** This module introduces the most common material encountered in the construction industry by exploring soil mechanics beginning with the fundamentals in civil engineering geology. The course is designed to challenge the student

to seek the key concepts in geology and soil mechanics and apply these concepts in projects and self-directed learning to achieve the following key objectives:

To provide a clear understanding of the role of geology and soil mechanics in achieving a successful construction project.

To form the basis for subsequent modules on Soil Mechanics and Geotechnical Engineering Design.

To generate enthusiasm for the subject through field trips, practical experimentation and case histories.

**Syllabus:** PART I The Earth and its formation; plate tectonics; physical and chemical processes; erosion and deposition; Quaternary geology; Rock types; igneous, sedimentary, metamorphic; geological maps and terminology; role of geology in civil engineering.

PART II

Geotechnical problem solving model - soil mechanics triangle; soil composition and chemistry, clay bonding and double layer; classification and description of soils; phase relationships; soil compaction and ground improvement techniques; effective stress principle including the influence of water flow on soil behaviour; permeability and flow nets; site investigation - trial pitting.

#### WT4502 - CONSTRUCTION TECHNOLOGY

ECTS Credits: 6 (Year 1 Module)

#### School of Engineering

**Rationale and Purpose of the Module:** This module builds on the material covered in WT4401 through applied practical coursework based on residential construction practice. The course emphasises best industry practice and is framed around the relevant legislative instruments governing residential construction in Ireland.

**Syllabus:**

- \* Site selection and analysis for residential construction û addressing engineering, planning and Irish architectural heritage and conservation.
- \* Soil identification, properties and behaviour û factors affecting drainage & foundation choice.
- \* Concrete technology and mix design.
- \* Environmental considerations in residential construction û sustainable technologies for waste disposal and energy.
- \* Introduction to housing estate development and

planning applications.

- \* Interpretation of construction drawings.
- \* Trouble shooting residential building problems via case histories.

**Prerequisites:** WT4401

## School of Engineering Year 2 Modules

### CE4044 - FLUIDS AND ENERGY – PLEASE NOTE THIS MODULE IS TO BE CONFIRMED

ECTS Credits: 6 (Year 2 Module)

#### School of Engineering

**Rationale and Purpose of the Module:** This module contributes to the energy theme of Civil Engineering by introducing important concepts and prediction tools used when analysing fluid flows in energy applications.

**Syllabus:** Description of fluid boundary layers for laminar & turbulent flows; resultant forces and advection rates at surfaces. Introduction to dimensional analysis/scale analysis/similarity analysis in fluids; conditions of similarity; derivation of dimensionless parameters; overview of dimensionless groups commonly employed in engineering; reading correlations from literature and extracting useful data; derive correlations from experimental data; flow structures and transition regimes; use of correlations for scaling; fundamental applications to energy problems with analysis of: pipe flows; valves and fittings; pumps; lift and drag on structures, heat transfer, etc.; description and application of fundamental heat transfer relations

### ME4022 - AIRCRAFT AND SPACECRAFT SYSTEMS – PLEASE NOTE THIS MODULE IS TO BE CONFIRMED

ECTS Credits: 6 (Year 2 Module)

#### School of Engineering

**Rationale and Purpose of the Module:** The purpose of this module is to introduce students to the engineering design principles and operation of the systems

incorporated in modern aircraft and spacecraft. Aerospace engineers are engaged in design, certification, operation and maintenance of aircraft systems through the whole lifecycle of aircraft and spacecraft. The role of the different systems in safety and operational characteristics and performance of aircraft and spacecraft is covered in this module. Moreover, the regulatory requirements and constraints in system design/re-design/modification and certification are covered, providing an integrated and holistic understanding of the technical and non-technical considerations involved in systems engineering.

**Syllabus:** Introduction to systems engineering principles: Systems integration and interaction Aeroplane Systems: Flight Control Systems, Fuel Systems, Engine Control Systems, Hydraulic Systems, Electrical Systems, Pneumatic Systems, Environmental Control Systems, Emergency Systems, Rotary Systems, Avionics

Advanced Systems: Civil and military advanced technology systems

System Design and Development: System design, major safety processes, requirements, environmental considerations, failure analysis and reliability, ETOPS, regulatory requirements and certification

Spacecraft systems: structures, electrical systems, thermal control, mission systems, attitude control systems, propulsion

### ME4052 - CELL AND TISSUE BEHAVIOUR FOR ENGINEERS

ECTS Credits: 6 (Year 2 Module)

#### School of Engineering

**Rationale and Purpose of the Module:** The purpose of the module is to give a basic appreciation of the physics of living cells and tissues. This is done through integration of physical chemistry, electrostatics and mechanics of biological systems.

**Syllabus:** Presentation of physical chemistry, mechanics and electrostatics in the context of a unifying framework of thermodynamics. The students will learn to be acquainted with concepts such as chemical potential, electrochemical potential, diffuse double layers, electroneutrality, Brownian motion. Integrate these concepts with the knowledge that they acquired in earlier modules on thermodynamics, strength of materials,

continuum mechanics, chemistry and biology. Application of the multiphysics of interfaces to mechanotransduction, tissue repair, cellular function, microfluidic devices, lab-on-a-chip and nanotechnological measurement. Gaining proficiency in laboratory skills of multiphysics of tissues and cells.

**Prerequisites:** ME4523

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#### **ME4414 - FLUIDS MECHANICS 2**

*ECTS Credits: 6 (Year 2 Module)*

##### **School of Engineering**

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

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

**Prerequisites:** ME4412

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#### **ME4736 - PHYSIOLOGICAL FLUID MECHANICS 1**

*ECTS Credits: 6 (Year 2 Module)*

##### **School of Engineering**

**Rationale and Purpose of the Module:** *To introduce the students to the field of physiological fluid mechanics, develop their knowledge of physiological fluid flows including airflow, blood flow and urology, study these flows in straight, rigid and compliant tubes and examine transport phenomena in biological systems, viscous flow, inviscid flow.*

**Syllabus:** Viscous and inviscid flow theory and applications. The role of transport phenomena in

biological systems and the definition of these processes, including momentum, convection, diffusion and binding interactions. Introduction to the primary physiological convective transport systems: cardiovascular system, respiratory system, urological and lymph systems. Properties of physiological fluids and constitutive relations; Newtons law of viscosity, non-Newtonian rheology and time dependant viscoelastic behaviour. The derivation of the conservation relations for fluid transport, dimensional analysis and scaling. Introduction to Mass Transfer, Ficks law of diffusion. Transport of Gases between blood and tissues: oxygen-haemoglobin equilibria and the dynamics of oxygenation of blood in lung capillaries.

**Prerequisites:** ME4412

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#### **MF4733 - MANUFACTURING INFORMATION SYSTEMS – PLEASE NOTE THIS MODULE IS TO BE CONFIRMED**

*ECTS Credits: 6 (Year 2 Module)*

##### **School of Engineering**

**Rationale and Purpose of the Module:** *The development of large-scale complex manufacturing 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 manufacturing performance-oriented approaches to system specification.*

**Syllabus:** - Software lifecycles: review of the waterfall model, prototyping, spiral, and object-oriented (OO) development models.  
 - Focus on understanding the Unified Enterprise.  
 - Characteristics of good software design - modules, cohesion, coupling or dependency, encapsulation, abstraction, etc.  
 - Requirements investigation.  
 - Requirements classification: functional and non-functional requirements.  
 - Entity Relationship Modelling, Requirements Engineering: use case diagrams and use case descriptions.  
 - Relational Database Design and Development.  
 - Other methodologies - DSDM, Agile approaches,

Extreme Programming.

Integration with, and data capture from, metrology equipment and bar-code readers. Interfacing with, and control of, stepping motors and programmable logic controllers. Use of application program libraries and integration with other software applications. File format conversion between computer aided design, manufacturing systems and other Manufacturing applications, eg. Shop floor data acquisition systems.

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#### **MF4756 - PRODUCT DESIGN AND MODELLING**

*ECTS Credits: 6 (Year 2 Module)*

##### **School of Engineering**

**Rationale and Purpose of the Module:** *3D parametric modelling systems are an integral part of the product design process. They are typically used to control key aspects of a product such as its design, communication, management, presentation, documentation and validation.*

*The aim of this module is to introduce students to these six key product design areas using SolidWorks in the context of generic best practice modelling strategies. In addition students will:*

*Understand the primary issues and considerations involved in designing a new product and develop a creative approach to the solution of design problems. Understand the concepts and practices associated with 3D parametric modelling and visualisation technology. Model and develop products and components in contemporary computer modelling software. Be able to create comprehensive product models and specifications in the context of the total development of a product. Develop cognitive modelling/visualisation, problem-solving and decision-making skills.*

**Syllabus:** Problem definition and clarification - design briefs; New Product Development (NPD) Concurrent Engineering NPD vs Traditional NPD; The deliverables of processes of design; design processes and the role of parametric CAD; Modelling strategies from cognition to prototype; Creative Design Methods; Product Concepts Surface modelling and solid modelling techniques; design intent: planning parts for design flexibility; relations and equations; parametric dimensions; design and modelling for manufacture and assembly; assembly modelling;

drawings; drawing documentation; BOMs; creating design tables using Excel for multiple part and assembly configurations; Library features: SolidWorks Toolbox of fasteners and components; importing and exporting files; CAD standards for data exchange; STL files and the FDM rapid prototyping system; linking with SolidCAM. FEA analysis and design validation; rendering and presentation techniques; product animation.

**Prerequisites:** MF4722

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#### WT4504 - BUILDING SERVICES 1 – PLEASE NOTE THIS MODULE IS TO BE CONFIRMED

**ECTS Credits:** 6 (Year 2 Module)

#### School of Engineering

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

**Key objectives**

- \* *Introduction to active and passive building services in domestic construction.*
- \* *Understand design, build and operation implications of these services.*

**Syllabus:** \* Heating ventilation and air conditioning services; district heating, heat loss calculations, thermal insulation, ventilation, air filters, heat recovery systems; principles of air conditioning, dual duct and convector air conditioning systems, DEAP.  
\* Hot and cold water supply services; low, medium and high pressure hot water heating.  
\* Drainage services; below ground drainage systems, pipe materials and pipe laying, soakaways, drain testing and inspection.  
\* Waste services; soil and waste systems, modified single stack and ventilated stack systems; resealing and anti-siphon traps, air pressure in discharge stacks; irrigation systems, sewage pumping, refuse disposal systems; sewage disposal, settlement tanks, bio-filters.

**Prerequisites:** PH4032

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#### WT4604 - LAND SURVEYING ECTS Credits: 6 (Year 2 Module)

#### School of Engineering

**Rationale and Purpose of the Module:** *The aim of this module is to provide an understanding of principles of land surveying and the use of specialist surveying equipment. The principles and techniques of surveying are applied to a wide variety of realistic construction project applications*

*The specific objectives are to provide:*

- \* *An understanding of surveying fundamental principles and use of surveying instruments*
- \* *Knowledge of the application of these to conduct land and site surveys*
- \* *Practical experience in using these modern instruments in the solving of a variety of site problem situations.*

**Syllabus:** Surveying fundamentals, tape & offset surveying; levelling, the theodolite and its use, tension determination, steel taping differential levelling, traversing, angle measurement electromagnetic distance measurement, satellite positioning systems, survey methods, analysis & adjustment of measurements, areas & volumes, setting out, curve ranging, topographic surveying, construction control surveys, geographic information systems, global positioning systems, construction applications, field coding, automatic target recognition, typical field operations. Practical case studies and fieldwork.

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## School of Engineering Year 3 Modules

#### DM4006 - ENGINEERING DESIGN

**ECTS Credits:** 6 (Year 3 Module)

#### School of Engineering

**Rationale and Purpose of the Module:** *To introduce the student to product engineering design systems and techniques.*

*To provide experience in product design and concurrent engineering.*

*To provide the students with experience in the use of finite element methods as part of the design cycle.  
To focus on the engineering of the solution by providing*

*hands-on experience in the analysis of case studies, supplemented by an overview of the theoretical analysis.*

**Syllabus:** Overview of the design process and innovative approaches in product design.

Design for manufacture, assembly, disassembly and service.

Product design and analysis tools, Solid Modelling and Finite Element Analysis.

Analysis Types: Static, Stress, Thermal, Contact stress. Design Optimization, Processing and Post processing - theoretical and practical issues.

Practical Case studies: static stress analysis, thermal analysis, design studies.

Use of the SolidWorks Simulation software package.

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#### ME4092 - AEROSPACE VIBRATIONS

**ECTS Credits:** 6 (Year 3 Module)

#### School of Engineering

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

**Syllabus:** Oscillatory motion; free vibration of single degree of freedom systems; harmonically excited vibration; transient vibration; vibrations under general forcing conditions; systems with two or more degrees of freedom; modal analysis; random vibrations in space launchers.

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#### ME4117 - VIBRATION ANALYSIS

**ECTS Credits:** 6 (Year 3 Module)

#### School of Engineering

**Rationale and Purpose of the Module:** *To develop an understanding of the role of vibration analysis in structural design.*

*To apply the techniques of modal analysis and the finite element method to solve structural vibration problems.*

**Syllabus:** Single degree of freedom systems. Free

response. Springs in series and in parallel. Logarithmic decrement. Forced response to harmonic excitation. Excitation by an unbalanced rotor. Response to periodic excitation. Fourier series. Impulse response. Response to arbitrary excitation. Free and forced response of two and multi-degree of freedom systems. Use of the modal superposition method. Use of the finite element method.

**Prerequisites:** ME4112

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**ME4134 - AIRCRAFT DESIGN – PLEASE NOTE THIS MODULE IS TO BE CONFIRMED**

**ECTS Credits:** 3 (Year 3 Module)

**School of Engineering**

**Rationale and Purpose of the Module:** To introduce the student to the important considerations involved in the design of an aircraft, with particular emphasis on the aerodynamic load calculation and airframe structural design. Of critical importance will be the design philosophies associated with safe structures.

**Syllabus:** Review of low speed aerofoil and finite wing aerodynamics, aerofoil stall characteristics, approximate methods for obtaining wing lift distributions, wing stall characteristics. Calculation of wing shear force, bending moment and torsional load distributions.

Structural design and analysis philosophies, material design allowables, reserve factors, construction principles, fail-safe, safe-life philosophies. Design of structural components for ultimate failure and fatigue life estimation, including cumulative fatigue. Fasteners and structural joints.

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**ME4226 - MECHANICS OF SOLIDS 2**

**ECTS Credits:** 6 (Year 3 Module)

**School of Engineering**

**Rationale and Purpose of the Module:** To understand and analyse and measure the state of strain at a point in a 2D strain field. To analyse stresses and deformation in circular plates under symmetrical loading. To be able to determine

yielding under multiaxial loading. To be able to predict the maximum deflection of a beam subjected to simple and complex loading in a plane. To predict the buckling load and maximum stress in a strut. To understand the factors influencing fatigue life and be able to predict the life of simple engineering components. To understand the basics of LEFM. To analyse the stresses in beams of unsymmetrical section.

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

**Prerequisites:** ME4213

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**ME4306 - BIOCOMPATABILITY**

**ECTS Credits:** 6 (Year 3 Module)

**School of Engineering**

**Rationale and Purpose of the Module:** To give a basic appreciation of the Cellular-Material Interactions that occur when a Material is used for different Biomedical Applications

**Syllabus:** Discussion of Pathological Changes and Approaches to repair. Classification of medical device interactions and methods of assessment. Relevance of testing to medical device design strategy, regulation, validation and post market surveillance. Evolution of the regulatory environment and its implications.

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**ME4516 - THERMODYNAMICS 2**

**ECTS Credits:** 6 (Year 3 Module)

**School of Engineering**

**Rationale and Purpose of the Module:** To provide an understanding of the mode of operation for actual heat pump and refrigeration systems and to analyse their performance characteristics. To provide an understanding of the mode of operation of

Rankine, superheat, reheat and regenerative steam power cycles and to analyse their performance characteristics.

To analyse the power output characteristics of pure impulse turbines and impulse-reaction axial flow turbines. To relate the performance and characteristics of the latter to steam enthalpy change in multi-stage operation.

To analyse the power input requirements, volumetric efficiency and heat loss characteristics for single stage and multi-stage compressors.

To provide an understanding of the mode of operation for actual 2-stroke and 4-stroke spark ignition and compression ignition engines and to analyse their performance characteristics with reference to mean effective pressure, indicated power, brake power, specific fuel consumption, volumetric efficiency, thermal

**Syllabus:** Refrigeration & Heat Pump Cycles, Vapour Power Cycles, Internal Combustion engines, Compressors, Seat Turbines.

**Prerequisites:** ME4523

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**ME4526 - INTRODUCTION TO HEAT TRANSFER**

**ECTS Credits:** 6 (Year 3 Module)

**School of Engineering**

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

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

Prerequisites: ME4412

### **ME4726 - FLIGHT MECHANICS - PLEASE NOTE THIS MODULE IS TO BE CONFIRMED**

ECTS Credits: 6 (Year 3 Module)

#### **School of Engineering**

**Rationale and Purpose of the Module:** To introduce the student to aircraft performance and the static and dynamic stability and control of aircraft.

**Syllabus:** International Standard Atmosphere, Aircraft speed and height conventions  
Aircraft engine thrust and drag characteristics, parabolic drag polar.  
Aircraft performance in steady, climbing and turning flight  
Range and endurance equations (including Breguet equations) for piston and turbine powered aircraft.  
Prediction of takeoff and landing distances.  
Longitudinal static stability, stick-fixed and stick-free stability margins.  
Manoeuvre point and manoeuvre margin.  
Introduction to dynamic stability, stability modes

Prerequisites: ME4424, ME4412

### **ME4746 - PHYSIOLOGICAL FLUID MECHANICS 2 - PLEASE NOTE THIS MODULE IS TO BE CONFIRMED**

ECTS Credits: 6 (Year 3 Module)

#### **School of Engineering**

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

**Syllabus:** The role of transport phenomena in biological systems and the definition of these processes, including momentum, convection, diffusion and binding interactions. Introduction to the primary physiological transport systems: cardiovascular system, respiratory system, gastrointestinal tract, liver and kidneys.  
Extension of fluid mechanics of capillary flow into

oscillating flow. Introduction to mass transport, derivation of the relevant conservation equations, dimensional analysis and scaling. Estimating mass transfer coefficients using correlations. Ficks law of diffusion (dilute solutions), the Stokes-Einstein equation and estimation of frictional drag coefficients. Osmosis and mass transport through membranes. Introduction to thermal transport, conduction, convection and radiation and derivation of the conservation equations. Estimation of heat transfer coefficients. Thermal regulation of biological systems

### **MF4736 - ENGINEERING ECONOMY - PLEASE NOTE THIS MODULE IS TO BE CONFIRMED**

ECTS Credits: 6 (Year 3 Module)

#### **School of Engineering**

**Rationale and Purpose of the Module:** This module locates engineering design in the context of a broad-ranging cost-benefit analysis, through the development of alternative solutions and their evaluation in terms of onward impacts, in a quantitative multi-annual economic reference framework. As such, it recognises the key importance of a common yardstick for costs and benefits involving capital sums such as spent on facilities, and periodic cash flows such as those resulting from improved methods or reduced because of poor quality. It recognises the reality of taxes and of uncertainty in outcomes.

*Engineering Economy is a core subject in the US ABET scheme for accreditation of professional engineering courses leading to the designation Professional Engineer.*

**Syllabus:** The key elements lie under the following headings:  
making economic decisions  
engineering costs and cost estimates  
interest and equivalence and interest formulas  
present worth analysis, annual cash flow analysis  
rate of return analysis, incremental analysis  
other methods - payback period, sensitivity and breakeven analysis  
uncertainty  
depreciation and taxes  
replacement analyses  
discount rates: inflation and escalation, selecting the

MARR

investment analysis in the public sector  
further topics: rationing capital amongst competing projects; accounting models and engineering economy

### **MT4006 - TISSUE ENGINEERING - PLEASE NOTE THIS MODULE IS TO BE CONFIRMED**

ECTS Credits: 6 (Year 3 Module)

#### **School of Engineering**

**Rationale and Purpose of the Module:** The rationale of this module is to augment the Biomedical Engineering undergraduate module portfolio with a module in Tissue Engineering and Regenerative Medicine.

The purpose of the module is to cover the physical principles and engineering science associated with Tissue Engineering, encompassing biomaterial selection, tissue scaffold design, bio printing, and cell-matrix interactions.

**Syllabus:** Fundamental Principles of Tissue Engineering and regenerative medicine &bull; Biomaterials in tissue Engineering: hydrogels; growth factors; synthetic scaffolds; Stem Cells for Tissue Engineering &bull; Tissue Scaffold design &bull; Scaffold fabrication Bioprinting; Electrospinning; freezedrying &bull; Cell Culture for Tissue Engineering &bull; Cell Proliferation and Migration &bull; Scaffolds for Tissue Based Repair &bull; Bioprinting &bull; Bioreactor Systems and Design &bull; Diffusion & Nutrient Transport Limitations in Tissue Engineered Constructs &bull; Skin Tissue Regeneration &bull; Cartilage Tissue Engineering & Regeneration &bull; Bone Tissue Engineering &bull; Cardiovascular Tissue Engineering &bull; Corneal Tissue Engineering and Replacement &bull; Cell encapsulation &bull; Immunomodulation and protection example Diabetes &bull; Peripheral Nerve Repair &bull; Cell Separation Technology &bull; Gene Therapy &bull; Regenerative Surgery in Orthopaedics & Sports Medicine &bull; Ethical Issues and Considerations for Tissue Engineering

## **School of Engineering**

# Year 4 Modules

## CE4028 - ENERGY EFFICIENT BUILDINGS: MODELLING AND DESIGN – PLEASE NOTE THIS MODULE IS TO BE CONFIRMED

ECTS Credits: 6 (Year 4 Module)

### School of Engineering

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

**Syllabus:** Building design and energy use: historical trends, current status and future trends Building energy policy at national and EU level; factors affecting human comfort; Steady-state and transient thermal physics of buildings; heat transfer mechanisms; performance metrics; typical metric values for building including exemplar low-energy and passive builds; design related and environmental performance drivers overall form, aspect ratio, surface-to-volume ratio, percentage glazing, orientation, site context, solar irradiance, prevailing winds, shelter, design features including insulation, solar shading, low-e coatings, automated shading and ventilation.

Overview of strategies for modelling building thermal physics; thermal resistance networks; lumped capacitance; steady-state vs. transient; dimensionless scaling parameters and empirical correlations; compiling input data - building fabric, thermal mass, weather data, building use, active, passive and mixed mode ventilation, thermal sources, heating & cooling systems, control strategies and feedback.

Design thermal model, build and digitise model, configure inputs, configure outputs, solve and interpret

outputs; describe scope and limitations of model; suggest modifications to enhance energy usage, update model, analyse response and appreciate cost benefit of improvements.

## CE4088 - REINFORCED CONCRETE DESIGN II – PLEASE NOTE THIS MODULE IS TO BE CONFIRMED

ECTS Credits: 6 (Year 4 Module)

### School of Engineering

**Rationale and Purpose of the Module:** This module develops the concepts and processes involved in the design of reinforced and prestressed concrete structures.

**Syllabus:** Reinforced Concrete (RC)  
Testing of a reinforced concrete beam. Prediction of failure. Failure analysis. Flat slab design. Punching shear resistance. Computer analysis. Design of slender RC columns. Strut & tie methods of analysis. Composite construction.

Pre-stressed Concrete  
History of pre-stressed concrete. Principles of pre-stressed concrete design. Advantages and disadvantages compare to RC. Transfer and service stresses. Loss of pre-stress. Ultimate limit states of flexure and shear. Deflection.

## DM4028 - ENGINEERING SUSTAINABLE PRODUCTS – PLEASE NOTE THIS MODULE IS TO BE CONFIRMED

ECTS Credits: 6 (Year 4 Module)

### School of Engineering

**Rationale and Purpose of the Module:** To inform the student of the need to design and manufacture products in an environmentally sustainable manner.  
To illustrate the use of life cycle analysis software to

ensure that the lowest impact material selection, manufacturing processes etc. are adhered to.  
To identify the various recycling/recovery processes available to ensure that the student designs a product with these solutions in mind at end of life.  
To identify key alternatives to existing fossil fuels in energy creation and thereby help promote a more sustainable manufacturing environment.

### Syllabus: Design for Environment

Strategies, tools, key fundamentals such as design for dematerialisation, design for product recovery and design for capital protection and renewal.

### Sustainable Manufacturing

Alternative energy supplies, solar, wind, geothermal, alternatives to oil such as bio-diesel, gaining energy from recycling materials or waste e.g. incineration, pyrolysis. Material properties, material property charts, material selection, case studies.

### Recycling Technologies

Magnetic separation, shredding, eddy current separation, infra red separation, examination of waste streams, destruction disassembly versus step by step disassembly. Design obstacles to disassembly, design techniques to encourage disassembly and thereby encourage effective recycling/recovery.

### Lifecycle Assessment

Overview of total product life cycle, from raw material selection to transport to manufacturing processes and systems to packaging and the impact individual decisions regarding the product have on the environment. Using LCA software to calculate the cost to the environment.

### Reverse Engineering

Techniques, systems of approaching systematic reverse engineering to enable design for the environment and to learn from previous mistakes. Product redesign can take the form of incremental or radical changes.

### Legislation

WEEE directive, RoHS directive, ISO 14062 environmental aspects to product design, ISO 9000.

### Design for End of Life

Examination of fastening technology, standardisation of techniques, placement of access points, location of high value/hazardous materials.

## **ME4008 - ORTHOPAEDIC BIOMECHANICS AND MECHANOBIOLOGY**

*ECTS Credits: 6 (Year 4 Module)*

### **School of Engineering**

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

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

## **ME4047 - FUELS AND ENERGY CONVERSION**

*ECTS Credits: 6 (Year 4 Module)*

### **School of Engineering**

Review of Thermodynamics. The Flow Through Gas Turbine Blade Rows: Compressible analysis; three dimensional flows; design example Combustion: fuels; methods of combustion; combustors; First Law Analysis of Combustion.; Second Law Analysis of combustion. Gas Turbine Performance.

## **ME4308 - BIOMATERIALS 2 - PLEASE NOTE THIS MODULE IS TO BE CONFIRMED**

*ECTS Credits: 6 (Year 4 Module)*

### **School of Engineering**

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

*environment.*

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

## **ME4718 - FLUID PROCESS CONTROL**

*ECTS Credits: 6 (Year 4 Module)*

### **School of Engineering**

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

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

## **PT4008 - DELIVER AND RETURN WITHIN SUPPLY CHAINS**

*ECTS Credits: 6 (Year 4 Module)*

### **School of Engineering**

**Rationale and Purpose of the Module:** *This module is the third in a stream.*

*There is a need to appreciate the external operational landscape and the complexities that arise in the multiplicity of processes encountered in international logistics operations. This takes in the processes of getting materials between suppliers facilities, intermediate production facilities and onwards to customers. These processes are subject to incessant disturbances, and also demands from myriad bodies governmental and commercial, with considerable uncertainty and risk components, yet customers expect a smooth supply of their regular products on time, to agreed high quality and sustainability standards, and*

*economically, as if nothing else matters. Framing these activities and applying them to configure and operate supply networks and to optimise their contribution to performance tradeoffs is the subject of this module. In the context of the Supply-Chain Operations Reference (SCOR) model these concepts lie in the domain of Deliver and Return activities.*

**Syllabus:** Concepts of Logistics and Distribution, Introduction to history and development, Channels of distribution, Planning framework for logistics, Logistics network planning and management.

Physical Logistics Planning Warehousing, stocking, order-picking, Transportation, modes of transport, intermodal freight.

International Contracting in Logistics International Contracts, Customs, Regulations, Incoterms, Managing transaction risk, payments, exchange rate exposure. Regulation and Green Logistics Reverse logistics and product lifecycle management, return of goods at end of life, Logistics and the environment.

## **PT4038 - PRODUCTION AND SERVICE SYSTEMS - PLEASE NOTE THIS MODULE IS TO BE CONFIRMED**

*ECTS Credits: 6 (Year 4 Module)*

### **School of Engineering**

**Rationale and Purpose of the Module:** *Prior module material may be seen as disparate unconnected knowledge. The aim of this module is to draw together learning from prior modules into a whole-systems perspective, through the application of operations theory to case questions in specific domain areas. This is a capstone module.*

**Syllabus:** Differentiation between production, manufacturing and service activities. Analysis of case examples linked back to theory of supply chain operations in specific domains, as follows. Systems dynamics phenomena: Forrester-Bullwhip effect and explanation (Beer game or similar eg mortgage game), in eg a service environment. Supply chain operations reference model SCOR, and SCE implementation framework, in eg a global high technology supply chain case context. New service development, including service

encounter and service quality, in eg a franchise casse context. Capacity and demand management, including forecasting and yield/revenue management, in eg a health service case context. Waiting time management and capacity planning in variable time and demand environments, eg airport or health service design case context.

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#### **WT4208 - BUILDING SERVICES 2 - PLEASE NOTE THIS MODULE IS TO BE CONFIRMED**

ECTS Credits: 6 (Year 4 Module)

#### **School of Engineering**

**Rationale and Purpose of the Module:** *The aim of this module is to provide a comprehensive introduction to the more complex building services and equipment being adopted in modern non domestic buildings. It is also an aim to introduce the student to key elements of services design for buildings. This module builds on the learning of WT4504*

- \* *Introduction to building services in non domestic construction including both active and passive services.*
- \* *Understand design, build and operation implications of these services.*
- \* *Have good knowledge of water installations to multi storey buildings*
- \* *Understand the essentials of electrical and gas distribution and supply*
- \* *Identify the principle fire fighting equipment needs for modern buildings*
- \* *Understand the principles of providing appropriate lighting within buildings*

**Syllabus:**

- \* Heating and air-conditioning services: energy performance measurements using, SBEM and NEAP; heating and air conditioning, temperature drop through structures; gas supply and distribution, gas controls, ventilation ducts and fans, solar heating, heat pumps and bio-mass.
- \* Hot and cold water services: Pipe sizing for hot and cold water multi-storey buildings, force and pressure, hydraulics.
- \* Drainage services: sustainable urban drainage, retention tanks, oil separation, green roof, grey water recycling

- \* Electrical services: electrical terms and installations, supply and distribution of electricity, supply controls, protection, conductor and cable rating, methods of wiring and distribution systems, single phase power circuits; electrical installations in large buildings; site electricity, electric space heating
- \* Access services: lifts, escalators and service ducts, automatic control.
- \* Lighting services: integration with electric light, natural lighting, artificial lighting, design of lighting, lighting controls
- \* Safety services: classification of fire risks, safety devices, heating and flues; sprinklers, risers and hose reel installations, dry and wet risers; portable and fixed extinguishers, automatic fire detectors, alarms and dampers, pressurisation of escape routes, automatic fire ventilation fire detection, security systems.
- \* Electrical services: supply to non domestic buildings micro generation (solar and wind)
- \* Data services; audio visual, broadband and telephony.

*Prerequisites: WT4504*

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