UNIVERSITY *of* LIMERICK

LIFELONG LEARNING PROGRAMME

ERASMUS STUDENT INFORMATION

PACKAGE

ACADEMIC YEAR

2009/2010

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EUROPEAN CREDIT TRANSFER SYSTEM

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The contents of this booklet are for information purposes only and should not be viewed as the basis of a contract between student and the University. No guarantee is given that modules may not be altered, cancelled or otherwise amended at any time.

GENERAL INFORMATION

Introduction

This information package describes the University of Limerick and the courses offered by the Kemmy Business School, Faculty of Education and Health Sciences, Faculty of Science and Engineering, and the Faculty of Arts, Humanities and Social Sciences, to assist prospective ERASMUS students to prepare their study period in this institution.

What is ECTS?

ECTS, the *European Community Course Credit Transfer System*, was developed by the Commission of the European Communities in order to provide common procedures to guarantee academic recognition of studies abroad. It ensures a comparable measure of learning achievements, and a consistent way of transferring them from one institution to another. Normally, 60 ECTS credits represent the workload of a year of study, with 30 ECTS credits given for a semester. Credits are awarded only when the course and all examinations have been successfully completed.

University of Limerick

The University of Limerick, then NIHE (National Institute for Higher Education) was established in 1972 on a 160 acre campus on the banks of the river Shannon, 4km east of the medieval city of Limerick. Limerick is Ireland's third largest city and the "capital" of the Mid-West region. Shannon International Airport is 20km away. The campus lies at the heart of a 600 acre National Technological Park, where over 50 different organisations are interacting with the teaching, research and cultural activities of the University.

The University of Limerick undertakes programmes of education and research to Doctorate level in its four constituent Faculties; Kemmy Business School, Faculty of Education and Health Sciences, Faculty of Science and Engineering, Faculty of Arts, Humanities and Social Sciences. The University was developed to help meet the rapidly changing economic and social needs that emerged upon Ireland's accession to the European Union. It is therefore a dynamic and responsive institution, which has also played a pivotal role in the economic development of the Mid-West region of Ireland. The University has also become a focus for a wide range of artistic activity and is home to some fine collections of Irish Art, the Irish Chamber Orchestra and the Irish World Music Centre. The compact nature of the campus and the University's size foster a close sense of community. The University believes strongly that the creation of a friendly, caring and cooperative atmosphere is the successful pursuit of any study programme.

There are fourteen buildings on campus: Main Building, Foundation Building, Schuman Building, Schrödinger Building, Lonsdale Building, Physical Education Building, Glucksman Building (Library), Computer Science Building, Materials and Surface Science Institute, Kemmy Business School, Health Sciences Building, Engineering Research Building, Millstream Building and the University Sports Arena. The administrative services (Admissions, Student Academic Administration, International Education Division, etc.) are all located in the Main Building. The Foundation Building houses a 1200 seat concert hall. The Student Centre complex houses the Student Union offices, Bank of Ireland, the Contemplative Centre, laundrette, Spar grocery shop, USIT (travel office), bookshop and two bars.

Institutional and Administrative Co-ordinators

Director of International Education Division: Prof. Liam Ó Dochartaigh

For all information, please contact:
LLP Erasmus Coordinator :
Dr. Patricia O'Flaherty
International Education Division
Room E0-030
University of Limerick
Limerick
Ireland
Tel: +353 61 202304
Fax: +353 61 213062
email: Patricia.Oflaherty@ul.ie
www.ul.ie/internationaleducation

Administrator International Education (Europe):
Yvonne Crosse
International Education Division, E0-030
University of Limerick
Limerick
Ireland
Tel: +353 61 202353
Fax: +353 61 213062
University of Limerick
email: Yvonne.Crosse@ul.ie
www.ul.ie/internationaleducation

Application Deadlines

Applications should be sent to Yvonne Crosse in the International Education Division, University of Limerick. The deadlines for receipt of applications are:
June 30th of each year for Full Year and Autumn Semester students,
October 31st of each year for Spring Semester students.

Academic Calendar

The University of Limerick operates a semesterised academic year. The dates for 2008/2009 are:

Autumn Semester
Orientation:	3 – 4 September 2009
Classes:	7 September – 19 December 2009
Week 13 (teaching)	30 November – 4 December 2008
Examinations**:	7 – 19 December 2009
Christmas Break*:	20 December – 4 January 2009

Winter Inter term Break*:   5 January – 25 January 2009

Spring Semester
Orientation:	21 & 22 January 2009
Classes:	25 January – 16 April 2010
Week 13 (teaching)	19 April – 23 April 2010
Easter Break*:	Good Friday & Easter Monday
Examinations:	4 – 17 May 2010

* Students may remain in their accommodation during breaks.

ERASMUS PROCEDURES

Bilateral Agreements

Students will not be considered for a ERASMUS placement at the University of Limerick unless a bilateral agreement has been signed and agreed by UL and the partner institution. The number of students to be exchanged between UL and its partners will be strictly adhered to. The University of Limerick **DOES NOT** accept free movers.

Incoming Student Applications

Application packages for incoming students will be sent to the ERASMUS Coordinator in each partner institution by **March 31st** of each year. This package will contain incoming student application forms. Please note that the incoming student application form **MUST BE FILLED IN** by the **ERAMUS Coordinator** at the home university and returned to the International Education Division, University of Limerick before the application deadlines.

Information Packages for Incoming Students

Following receipt of an application form all ERASMUS students will receive an information package from the International Education Division at the University of Limerick. This package contains an on-campus accommodation form, medical form and an incoming student manual.

Visa Requirements for Non-EEA Students

All Non-EEA students coming to the University of Limerick are required by the Irish Department of Justice (www.justice.ie) to register with the local Gardai (Irish Police). Non-EEA students are required to provide the following information:

For students in UL for less than 3 months or for the Autumn/Spring Semester only require:

- 1 passport sized photograph
- Valid passport
- Proof of health insurance
- Proof of financial ability

For longer than one semester:
- As above plus 3 passport sized photographs.

Linguistic Requirements

As all ERASMUS students are required to possess sufficient language skills to attend lectures and sit examinations in a host university, students should be competent to communicate through the medium of English prior to their arrival to the University of Limerick. Intensive language courses are available at a cost of €250, for 3 days, during the week prior to the start of the Autumn Semester and they are run only if numbers are sufficient to cover the company's costs. These courses are run by the University of Limerick Language Centre (http://www.ul.ie/~clc/) an affiliate company of the University. The courses are optional and are not regarded as part of the ERASMUS Programme.

ERASMUS students can take English as a Foreign Language (EFL module) as part of their curriculum. They should discuss with the coordinator at their home university whether they will receive credits for this module. Students should be aware that if they do not receive credit for EFL, and therefore have to take another module to obtain the necessary total of credits, their timetable is likely to become too loaded to take EFL as an extra module. However, EFL is highly recommended as a module for practically all ERASMUS students. Some academic coordinators at the University of Limerick have made it compulsory for incoming students to take EFL as one of their 5 chosen subjects, this rule applies to Business students.

Orientation Programme

The Orientation Programme, organised by the International Education Division, introduces students to the various services and systems in operation at the University of Limerick, e.g. academic issues such as regulations, enrolment and module registration, other issues such as health services, sports facilities, arts and entertainment. The Orientation Programme for Autumn, Full year and Spring ERASMUS students takes place over a two day period on the Thursday and Friday before the beginning of each semester. As part of the Orientation Programme, students will meet their UL Academic Coordinator to discuss module choices.

Further details may be obtained from:

International Education Division
Room E0-030
University of Limerick
Limerick
Tel: +353 61 202353/202304
Fax: +353 61 213062
Email: Erasmus@ul.ie

ACCOMMODATION

On-Campus Accommodation

Once you have been nominated by your home University for the ERASMUS programme the International Education Division at the University of Limerick will send you the application form for on-campus accommodation. A number of single rooms have been reserved for ERASMUS students in the four student villages on campus. Consisting of 4 and 8-bedroomed houses in Plassey Village, 6-bedroom houses in Kilmurry Village and 6-bedroom houses in Dromroe Village and Thomond/Cappavilla Villages, these residences are of a very high standard. The shared amenities of each house are a fully equipped kitchen/living room with cable TV and two shower/WCs. All bedrooms in Dromroe Village are en suite. Individual study-bedrooms contain a bed, desk, wardrobe and wash-basin. Duvets are supplied, however bed linen and pillows are required. Each village have communal areas which may have a village hall, shop, café or pizzeria.

Please note that on-campus accommodation is very limited and is allocated on first come first served basis. Booking forms must be accompanied by a €250.00 booking deposit in order to reserve your place. Students requiring on-campus accommodation should select more than one option in order of choice on the booking form. Every effort will be made to allocate students their first preference.

Application forms for accommodation in Plassey, Kilmurry, Dromroe, Thomond and Cappavilla Student Villages to be returned to:

Ms. Deirdre Ryan
International Bookings
Accommodation Office
University of Limerick
Limerick
Ireland
Deirdre.Ryan@ul.ie

Dromroe: 6 Bed Appartment € 4,506.00**
Dromroe: 2 Bed Apartment € 4,972.00*
Thomond/Cappavilla: 6-Bed Apartment €4,506.00
Thomond/Cappavilla: 6 Bed Apartment € 4,222.00*
Thomond/Cappavilla: 4 Bed Apartment € 4,636.00*
Thomond/Cappavilla: 2 Bed Apartment € 4,972.00

* Rental fees include internet connection as well as utilities (energy, refuse, cable TV and maintenance service).

You are advised to arrive during office hours Monday to Friday (9.00 am – 5.00 pm). If this is not possible, arrangements can be made to have your keys left at the University's Main Reception, which is open 24 hours a day. Please inform the Village Manager of your date and time of arrival approximately a week in advance in order to avail of this facility.

Please note:

- **Students who indicate that they wish to stay a full year and subsequently vacate their room at the end of the first semester will be in breach of their lease and are liable for full year rental fees. Students will forfeit the booking deposit and any prepaid rents. It is essential that you take this into account before signing the application form.**

- **The total rent for one semester plus the deposit must be paid within 2 days of a student's arrival.**
- **It is not possible to pay by instalments.**
- **Payment can be made by either Credit Card where a service charge of 2% will be added or by bank transfer / wire transaction. Relevant IBAN / BIC / Swift codes are on the rear of the accommodation booking form.**
- **International Postal Money Orders are not acceptable.**
- **Euro cheques and Personal cheques are not acceptable.**
- **Once village accommodation has been assigned, living arrangements may not be changed upon arrival at the University. Students may remain in village accommodation during holiday breaks.**

Off-Campus Accommodation

Students who have not secured on-campus accommodation are advised to book a room in temporary accommodation (bed & breakfast)

for at least 2 nights in order to look for suitable accommodation upon arrival. Unfortunately, there is no hostel accommodation in Limerick. The following is a list of B & Bs:

Near the University of Limerick

Castletroy Lodge Bed & Breakfast
Dublin Road
Castletroy
Tel: +353 61 331167
Cregans Bed & Breakfast
Dublin Road
Castletroy
Tel: +353 61 331347
email: cregansbandb@eircom.net

Students are advised not to book off-campus accommodation prior to viewing. Students may visit Limerick during the summer months or arrive some time before the start of the semester for this purpose. Students may stay in temporary accommodation while looking for suitable long-term accommodation. Rooms in the self-catering sector are of varying standard. Rooms should always be viewed before renting, if possible, during the summer months, when there is more selection. It is very risky to wait until just prior to the start of the semester before reserving this type of accommodation, as there is a large demand in Limerick at present. The rooms are usually in houses of non-resident landlords. Duvets and bed linen are not provided and desks are not always available. Students share all other facilities. Kitchens are normally fully equipped. Weekly or monthly terms as agreed with the landlord, are currently approximately €240-€280 per month. Electricity and heating charges are additional to rent.

Please note:

- **A deposit of one month's rent plus an electricity deposit is generally required.**
- **Students who opt for self-catering accommodation or lodgings must find their own accommodation upon arrival in Limerick. It is inadvisable to book before viewing or to reserve accommodation through the Internet, without viewing in person**
- **Students may remain in self-catering accommodation during holiday breaks.**

- **Do not book off-campus accommodation before arrival.**

The accommodation office will assist you in finding suitable off-campus accommodation. Opening Hours: Monday – Friday: 11h00-12h30 and 14h30-16h30.

Accommodation Office (Room D0-035)
University of Limerick
Limerick
Tel: +353 61 202412
email: accommodation@ul.ie
http://www.ul.ie/~accommodation/

Lodgings

Students interested in living with an Irish family may be interested in lodgings/digs. This type of accommodation may be culturally rewarding in terms of integrating into Irish family life, and improving language competence. Bedrooms can be shared or single. The cost per week includes all expenses, including breakfast and evening meals.

ON CAMPUS FACILITIES

Library

The University Library, which is fully computerised, is a designated European Documentation Centre and receives all official publications of the European Union. The current collections in the library number 200,000 books and 7,250 audio visual items. There are subscriptions to approximately 2,700 journal titles.

Computer Facilities

The Information Technology Department (ITD) provides computer facilities for all University of Limerick staff and students. PCs are available to students on an open-access basis, except when they are booked for classes. Most PCs are heavily booked between 09h00 and 17h00 during the semester. However, the biggest PC cluster (80 PCs) is not block booked, and is available to students on a first-come, first-served basis. ITD PC clusters are open from 09h00-22h00 during semesters. ITD issue all ERASMUS students with UL email and print accounts. The software applications available to students are based on Microsoft Windows. Students do not require their own software copies as all software is centrally maintained on file savers. The same group of applications is available in all PC clusters. Some familiar Windows software applications available are: MS Word, Excel, Access, PowerPoint, SPSS, CD-ROM database access, etc. More specialised applications on offer are outlined on the ITD website (www.ul.ie/ITD/Index.html). Network connections are available in all on-campus accommodation at a charge of €65 per semester.

Sports

The University of Limerick offers extensive first class on-campus sport facilities. The diverse range of facilities is unmatched anywhere else in Ireland. People from Olympic class athletes to staff and students can avail of all facilities, which include the following:

- Olympic size 50m indoor swimming pool
- Indoor diving pool
- Steam room
- Sauna
- Four full sized indoor courts
- Cardio fitness suite
- Elite training facility
- Aerobics studio
- 60m six lane indoor sprint track
- 225m suspended three lane indoor jogging track
- 2 squash courts
- Indoor climbing wall
- 4 outdoor tennis courts
- 8 lane 400m outdoor athletics track
- Over 40 acres of playing fields
- Flood-lit astro turf
- Extensive changing facilities

A detailed description of all sport facilities is available at www.universityarena.com In addition, students can enjoy horse-riding, orienteering, sailing, canoeing and wind-surfing at off-campus locations.

University Restaurants

There are eleven restaurants on campus including three bars; two restaurants in the Main Building and one in every other building with the exception of the Schrödinger and Lonsdale. These restaurants are open all day with a basic meal costing approximately €5.

Transport

Students coming to the University of Limerick are advised to travel to Shannon Airport (SNN), which is 20km from Limerick. Bus Eireann runs buses from Shannon Airport to Limerick city centre which costs approximately €6. Taxi costs from the Airport to the University of Limerick vary from €40 - €45. A regular bus service runs between the University campus and the city centre. A single fare costs €1.30, a weekly pass approx €10 and a monthly pass €33. Cycling is a common student transport option here, but students should be aware that there are limited designated cycle lanes in Limerick. Ireland's major cities are connected by rail and bus services. The more remote rural areas are generally accessible via regional services.

HEALTH AND INSURANCE

All EU students are eligible to avail of full medical services in Ireland. However, in order to do so, it will be necessary to bring a European Health Card from your home country. It is emphasised that the European Health Card gives an entitlement to public health care for medical treatment. Additional private health care can be obtained from the following Irish Health Insurance companies, Quinn Healthcare (www.quinn-healthcare.com) or Voluntary Health Insurance Board (www.vhi.ie).

The University houses a Student Health Centre (www.ul.ie/medical) where two nurses are in full-time attendance. The Centre is open on weekdays from 09h00 to 16h30 and does **not** provide services outside these hours. A doctor and physiotherapist are also available at specified hours. Visits to the Centre are free of charge. It is advisable to register with a local doctor for the duration of your stay.

COST OF LIVING

The total cost of living for students in Ireland is estimated at approximately 1000 Euro per month.

Estimated Semester and Annual Living Costs for Students 2008/2009

Fixed Costs	Semester	Year
On-Campus Accommodation*: see above	1,649.00	3,298.00

for rents	
Books and other Academic Requisites €460	
Clothes, Laundry etc. €660	
Medical Insurance** (private) (optional) €440	
Food (self catering)€ 2,100	
Total* €5246 (approx)**	

*   On-campus accommodation includes electricity and heating charges.
**   Medical insurance based on UL Discounted Group Rate.
***   This does not include travel within Ireland or social expenses.

DEPARTMENT OFFICES

The following are useful office numbers :

Administration
Room No.
Department Office

E0001	Admissions Office
D0035	Accommodation Office
E0005	Co-operative Education
E0030	International Education
GLG020	Information Technology
D0033	Plassey Campus Centre

Student Village Accommodation

E1006	Print Room
CM060	Student Health Centre
E0001	Student Services

Kemmy Business School

KB318	Accounting and Finance
KB318	Economics
KB335	Marketing and Management
KB335	Personnel and Employee Relations

Faculty of Education and Health Sciences

DM043	Education and Professional Studies
CS1035	Department of Psychology

Faculty of Science and Engineering

SR3025	Manufacturing and Operations Engineering
B3027	Materials Science and Technology
L1034	Mechanical and Aeronautical Engineering
CS1004	Computer Science and Information Systems
D2031	Electronics and Computer Engineering
D2034	Mathematics and Statistics
B3046	Chemical and Environmental Sciences
SR2038	Life Sciences
C0063	Physics
P1025	Physical Education and Sports Science

Faculty of Arts, Humanities and Social Sciences

C1078	Politics & Public Administration
C1078	History
F1003	Sociology
FG015	Irish World Music Centre
MC1002	Languages and Cultural Studies
FG013	Law

MODULES

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. ERASMUS students can choose from a range of modules and can register for modules from different faculties and departments. (Generally, students are required to take 3 modules from within the subject area of the Bilateral Agreement and may take 2 modules outside this main subject area). Acceptance on these modules is subject to academic prerequisites, timetabling constraints and number of students enrolled.

Number of Modules and ECTS Credits

The normal course load at the University of Limerick is 5 modules per semester. ERASMUS students are limited to a **maximum** of 5 modules and a **minimum** of 3 modules per semester. Each course is awarded 6 ECTS Credits and the normal work load per semester is 30 ECTS credits.

Module Codes

The letters in a module code refers to the subject area e.g. **EC**4101 = Economics and **LA**4101 = Law. The first number (4) stands for an undergraduate module (5=postgraduate), the second number (1) stands for the year (1st year) and the final number (1) indicates the semester in which the module would normally run (1st semester). Modules ending in digits 1-2 would run in the 1st year of a course, modules ending in digits 3-4 would run in the 2nd year of a course, modules ending in digits 5-6 would run in the 3rd year of a course and modules ending in digits 7-8 would run in the 4th year of a course. The three digit codes found at the right of a module title represents the number of corresponding Lecture (L), Tutorial (T) and Laboratory (Lab) hours (in this order).

L   =   Number of lectures per semester.

T   =   Number of tutorials/seminars/language classes per semester; the latter are smaller groups and more interactive.

LAB   =   Number of laboratory based classes per semester.

The bold code opposite the module title corresponds to the semester and college year of the programme, e.g. Autumn/1 (Autumn semester in the first year).

ADMISSION AND REGISTRATION PROCEDURES

Learning Agreements

ERASMUS students coming to study at the University of Limerick must complete a learning agreement prior to their arrival in Limerick indicating their planned programme of study. Students may have to modify the agreed programme of study upon arrival at the University of Limerick for a variety of reasons: timetable clashes, un-suitability of chosen modules, academic pre-requisites etc. The learning agreement form provides for changes to the originally agreed study programme/learning agreement. Agreement to the changes by all parties must be obtained in order to guarantee full academic recognition of all course units followed. It is important that the student knows that the modules and programmes of study finally selected must be approved by the sending and receiving institutions in order to be fully recognised. Changes to the originally agreed programme of study will be indicated on the reverse side of the learning agreement and duly counter-signed by the student and the coordinators of both home and host institutions.   It is important to note that changes to the originally agreed programme of study should be made within three weeks after the student's arrival at the University of Limerick.

Teaching and Learning Methodologies

The teaching methodologies used throughout the programme will vary with class sizes, the early years being characterised by large groups and therefore necessitating formal lectures for most modules. Language modules, science modules and information technology modules will require smaller laboratory size interactive groups.

Assessment Methods

Assessment methods include mid-term examinations, multiple choice examinations, individual and group projects, essay/report writing, semester papers, short answer and essay type/problem solving examinations. Both oral and written forms of assessment will be utilised throughout the programme. Class participation is encouraged where appropriate and used as part of the assessment in selected modules.

Local Grading System

A grade, representative of the quality of a student's performance in a particular module, will be awarded at the end of each semester for each module that a student is registered for. Grades range from A (indicating excellent performance) to C3 (satisfactory pass) to F (failure) with intermediate grades in between.

ECTS Grading System

ECTS Grade	UL Grade	Award Equivalent	Quality Point Value (QPV)	Credits Awarded
A	A1	First Honours	4.00	Yes 6 ECTS
A	A2	First Honours	3.60	Yes 6 ECTS
B	B1	Honours 2.1	3.20	Yes 6 ECTS
B	B2	Honours 2.1	3.00	Yes 6 ECTS
B	B3	Honours 2.2	2.80	Yes 6 ECTS
C	C1	Pass	2.60	Yes 6 ECTS
C	C2	Pass	2.40	Yes 6 ECTS
D	C3	Pass	2.00	Yes 6 ECTS
D	D1	Compensating Fail	1.60	Yes 6 ECTS
E	D2	Compensating Fail	1.20	Yes 6 ECTS
F	F	Fail	0.00	No
	NG	Fail	0.00	No
	G	Audit	-	No
	I	Certified illness/bereavement		No
	M	Awarded in case of projects spanning multiple semesters; or sequences of definitely linked modules		No
	P	Pass in a module		Yes
	N	Failure in a module taken on pass/fail basis		No

DEGREES OBTAINED BY ERASMUS STUDENTS

A Bachelors Degree is obtained by successful applicants after 4 years of study. Students are obliged to complete the equivalent of 240 (60 X 4) ECTS credits (including co-operative education credits) with a satisfactory grade average of C (2.0 on a scale of 0 to 4). Honours Bachelors Degree qualifications are awarded to students with or above 2.7 (C1/B3 average), upper second class honours for students with a score of 3 or above (B2 average) and first class honours to students with a score of 3.4 or above (A2/A1 average). ERASMUS students from other institutions obtain their home based qualifications and receive credits for modules satisfactorily completed at the University of Limerick.

KEMMY BUSINESS SCHOOL

Dean : Professor Donal Dineen

Department/Faculty Information

The Kemmy Business School comprises four departments that jointly run the Bachelor of Business Studies Degree. The departments are: Accounting and Finance, Economics, Management and Marketing, Personnel and Employment Relations.

The courses of the Kemmy Business School are designed to provide a challenging third level educational experience, offering considerable opportunities for personal development. A priority of the School is that its teaching programmes are relevant and applied to the economic and social development of Ireland in a highly competitive international global context. Through the adoption of varied teaching methodologies, students become professionally competent in their chosen areas of study.

The KBS commitment to quality enhancement of the BBS programmes is reflected in continuous updating of course materials, an increasing use of e-learning and other new methods of delivery and close industry links which provide for a shorter lead-time from business change to classroom response.

Through the emphasis on experiential learning and project work students develop a number of key lifelong skills such as teamwork, decision-making skills, time management, conflict management presentation and communication skills.

Erasmus Academic Coordinator

Gregory Knipe
Department of Economics
Telephone: +353-61-202117
email: gregory.knipe@ul.ie

Undergraduate Degree Programmes Offered

Bachelor of Business Studies **(LM050)**
Bachelor of Business Studies with a Modern Language (French)**LMO52**
Bachelor of Business Studies with a Modern Language (German)**LMO53**
Bachelor of Business Studies with a
Bachelor of Business Studies with a Modern Language (Japanese)**LMO55**

College of Business – Autumn

AC4001 Principles of Accounting (Autumn/1)

3 hours per week; 13 weeks/3rd semester; 26L/13T; ECTS credits:6

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

and balance sheets, cashflow statements; nature, purpose, scope and framework of auditing.

AC4213 Financial Accounting (non-business) (Autumn/2)

4 hours per week; 13 weeks/3rd semester; 26L/26T; ECTS credits:6

This module introduces the non-specialist student to the fundamental concepts and practices of financial accounting. Accounting is presented as a manifestation of various social and political pressures, which required that techniques be developed to account for trading and wealth. The topics covered include accounting and auditing in their political, regulatory, historical, social, economic and international contexts; introduction to the theoretical, conceptual and regulatory frameworks of accounting; corporate governance; traditional accounting model; nature, purpose, scope and framework of auditing; the impact of information technology on accounting systems; capital, income and profit measurement; accruals, prepayments and adjustments; depreciation and stocks; distribution of profits; profit and loss accounts and balance sheets, cash flow statements; reconciliation of operating cash flows to operating profits; financial statements analysis, financial ratios and performance analysis. This module is designed to be a prerequisite for the module AC4204 Management Accounting and Finance, offered in the spring semester.

AC4305   Financial Information Analysis   (Autumn/3)

3 hours per week; 13 weeks/3rd semester; 26L/13T; ECTS credits:6

User needs, corporate report, decision-usefulness approach; accounting information and capital markets, efficient markets hypothesis; accounting information and security prices; financial market information; presentation of accounting information; companies acts, EU directives; analysis of financial statements; recognition and measurement issues; substance over form; performance indicators; ratio analysis; uses and limitations, of-balance sheet financing, creative accounting; corporate social reporting; forecasts and budgets. *Prerequisite AC4204*

AC4407 Intermediate Accounting 2 (Autumn/4)

3 hours per week; 13 weeks/7th semester; 26L/13T; ECTS credits:6

Issues in conventional Financial Accounting and Reporting ctd.: Accounting for capital, capital instruments, convertible debts. Issue, forfeiture and redemption of shares and debentures. Company reorganisations. Post Balance Sheet events (SSAP 17) and Contingencies (SSAP 18). Taxation and Grants (SSAP's 4,5,8 and 15). Leases and Hire Purchase (SSAP 21) Pensions (SSAP 24). Price Variation Accounting (SSAP 16). Issues raised by new financial instruments.
Prerequisite AC4315

AC4417 Management Accounting 1 (Autumn/4)

3 hours per week; 13 weeks/7th semester; 26L/13T; ECTS credits:6

Objectives, scope and framework of management accounting; management accounting and organisation control; cost accumulation for stock valuation and profit measurement; product costing systems; application of cost-volume-profit techniques; marginal costing and non-routine decision making; accounting information for pricing decisions.
 Prerequisite AC4204

AG4307 Agribusiness 3-0-0 (Autumn/4)

3 hours per week; 13 weeks/7th semester; 39L; ECTS credits:6

Analysis and prescriptions for the major agribusiness sectors; dairy products, the meat and food industries, horticulture and arable crops. Particular features of the Irish Food Industry; seasonality of supply, distribution including "the cold chain", adding value, branding and "price making" as against commodity trading and "price taking". Developing agribusiness strategies, particularly in the food sector, at the macro-, and micro- levels. New developments in food technology; production techniques, extension of shelf life, packaging product presentation and quality assurance. The role of marketing research; identifying opportunities, including agritourism and "green" organic products. Establishment of innovative agribusiness projects - the process, including feasibility studies. Integrated rural development; national and EC initiatives, including the "LEADER" programme. Environmental issues; the role of the EPA, Environmental Protection Agency, and the implications of national/EC legislation for agribusiness.

CM4203 Communications (Autumn/2)

3 hours per week; 13 weeks/3rd semester; 26L/13T; ECTS credits:6

Communications in its social, economic and cultural context: information society; role of new technologies; media; postmodernism; argument analysis, reasoning, structuring and defending arguments; persuasion: psychology of persuasion and motivation; advertising as persuasion, including codes of visual communication; persuasion and the spoken word; style: effective writing strategies for various contexts (academic, journalistic, informative, persuasive etc.); presentation.

EC4003 Intermediate Microeconomics (Autumn/2)

3 hours per week; 13 weeks/3th semester; 26L/13T; ECTS credits:6

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

EC4035 Economics of Integration (Autumn/2)

3 hours per week; 13 weeks/3th semester; 26L/13T; ECTS credits:6

The European Union in the World. Theory of Economic Integration; Stages of Economic Integration in Europe. Monetary Integration. The EC/EU Budget. The Common Agricultural and Fisheries Policy. The Common Commercial Policy. Regional and Social

Cohesion. Industrial and technological Policy.
External economic relations of the EU; EU Integration
in a Comparative Perspective. *Prerequisite: EC4101
and EC4102.*

**EC4045   Economics of Natural Resources
(Autumn/2)**

3 hours per week; 13 weeks/3th semester; 26L/13T; ECTS
credits:6

Nature, scope and key concepts of natural resource
economics; market efficiency and sustainability;
Optimal level of pollution; Public policy instruments
(Tax, subsidy, emissions, trading, command and
control); Economics of renewable resources (forestry
and fishing); Economics of non-renewable resources
(coal, oil and gas; uranium); Economics of bio-
diversity wild life preservation; Natural resources and
economic growth.

EC4101 Microeconomics (Autumn/1)

3 hours per week; 13 weeks/1st semester; 26L/13T; ECTS
credits:6

Scope and method economics; the theory of consumer
choice; individual and market demand; theory of
production; the costs of production; profit maximisation
and the competitive firm; monopoly (including multivalent
and price discrimination models).

EC4111   Microeconomics (non business) (Autumn/1)

3 hours per week; 13 weeks/1st semester; 26l/13T; ECTS
credits:6

Introduction: scope and method of economics; the theory
of consumer choice; individual and market demand; theory
of production; the costs of production; profit maximisation
and the competitive firm; monopoly (including multivalent
and price discrimination models)

**EC4213 Intermediate Economics (Non-Business)
(Autumn/2)**

3 hours per week; 13 weeks/3th semester; 26L/13T; ECTS
credits:6

Intermediate microeconomics: imperfect competitive
market structures, monopolistic competition, models of
oligopoly (collusive and non-collusive models) pricing and
allocating factors of production, labour demand and
supply, competitive labour markets, effects of unions,
human capital differences, wage differentials; Intermediate
macroeconomics: labour markets, real and nominal wages,
money illusion, labour markets in the extended Keynesian
model , monetarism, neo-classical model-rational
expectations, Phillips curve, purchasing power parity and
real exchange rates, Irish experience in the EMS.

EC4307 Econometrics (Autumn/4)

4 hours per week; 13 weeks/7th semester; 26L/26T; ECTS
credits:6

Introduction; regression analysis, estimation, method of
ordinary least squares, measuring 'goodness of fit'. The
Classical Linear Regression Model, Properties of OLS
estimators; Gauss-Markov theorem. Interval estimation
and hypothesis testing. Multiple regression analysis.
Heteroscedasticity; autocorrelation; multicollinearity.
Dynamic ecometric models; autoregressive and
distributed-lag models. Simultaneuos-equation models.
Time series econometrics.

**EC4333 Economics of European Integration
(Autumn/2)**

3 hours per week; 13 weeks/3d semester; 39L; ECTS
credits:6

Introduction: member states' major economic indicators;
theory of economic integration (new international trade
theories), and stages of economic integration; monetary
integration - the road to economic and monetary union; the
EU budget; the common agricultural policy; regional and
social cohesion (polarisation trends; convergence;
employment issues; impact of structural funds); industrial
and technological policy; external economic relations of
the EU; Lome Convention and EU-Asia relations;
conclusion; current issues in European economic
integration; diversity, flexibility and coherence of
economic policies.

EC4407 Ireland in the World Economy (Autumn/4)

3 hours per week; 13 weeks/7th semester; 39L; ECTS
credits:6

International demographic trends; labour force analysis -
employment and unemployment trends; industrial change
and industrial policy; Irish fiscal policy in an international
context; Ireland and the European community -
performance and prospects; sectoral developments in the
international economy - effects for Irish employment and
output; discussion on international economics; trade
theories.

EC4417 Industrial Economics (Autumn/4)

3 hours per week; 13 weeks/7th semester; 26L/13T; ECTS
credits:6

Scope and method of industrial economics: a new version
of the firm; the structure - conduct - performance paradigm
and its limits, (structuralisms - contestable markets - game
theory); market structures in the European community,
(concentration, entry barriers...); firms restructuring in the
EC, (integration, diversification, merger, take over .....);
technological and product innovation; performance of
firms; aspects of industrial policy, (merger control, abuse
of dominant positions in the EC...); inter-actions between
corporate integration and regional integration; case studies,
(machine-tools, textile, pharmaceuticals).

EC4427 Managerial Economics 1 (Autumn/4)

3 hours per week;13 weeks/7th semester; 26L/13T; ECTS
credits:6

Constrained and unconstrained optimisation techniques;
demand analysis, demand estimation (including
introduction to econometrics); demand forecasting,
decision-making under uncertainty, pricing models to
account for production relationships, capacity
relationships, demand relationships; transfer pricing, mark-
up pricing; decision making in the public sector
introducing the rationale and means of government
intervention in the case of market failures, cost-benefit
analysis; capital budgeting and investment decisions.

**EP4003   Entrepreneurship and Innovation
(Autumn/2)**

3 hours per week; 13 weeks/3rd semester; 26L/13T;
ECTS credits:6

The module provides an introduction to the nature,
development and strategic importance of
entrepreneurship and innovation, the entre- preneurial

process, schools of thought on entrepreneurship, the environment for entrepreneurship, corporate entrepreneurship, theories and models of creativity and innovation in products, services, processes, product strategy, new product/service development, business planning and development, market entry strategies, marketing inventions and innovations, technology transfer, intellectual property and success factors integral to the development of an entrepreneurial culture.

EP4315   Enterprise Formation (Autumn/3)

3 hours per week; 13 weeks/5th semester; 26L/13T; ECTS credits:6

The role of entrepreneurship in economic development; innovations, business opportunities, entrepreneurial skills and characteristics; the entrepreneurial process; marketing strategies, the business plan, support systems and sources of finance; growth strategies, management development, high-technology entrepreneurship, strategic planning and entrepreneurship.

EP4407 Enterprise Development (Autumn/4)

3 hours per week; 13 weeks/7th semester; 26L/13T; ECTS credits:6

Evaluating business opportunities; preparation of a formal business plan; industry analysis; market research, market/sales strategies; product development, patent manufacturing/operations; cash flow projections, projected profit and loss accounts, balance sheets, establishing project credibility, exhibition and project presentation.
Prerequisite EP4315

EP4607 Product Design and Development I (Autumn/4)

3 hours per week; 13 weeks/7th semester; 26L/13T; ECTS credits:6

Nature and development of entrepreneurship, innovation, new product development, market research, screening new ideas, business analysis, prototype development, testing, commercialisation, preparing a business plan, industry analysis, marketing strategy, production/operations, funding requirements, cash flow, profit and loss accounts, balance sheets, managing the new business; engineering design history of the 20th century, design approaches, constraints and alternatives, KJ. Type solution processes.

FI4003   Finance (Autumn/1)

3 hours per week; 13 weeks/1st semester; 26L/13L; ECTS credits:6

Students are introduced to and learn to use and evaluate a range of discounted cash flow techniques, Qualitative aspects of capital Budgeting and investments are also covered. The concept of market efficiency and of the link between risk and return are illustrated by reference to historical returns. Basic issues around share valuation are also discussed, and the students are introduced to derivative instruments, and how they may be used both defensively and aggressively.

FI4005   Advanced Corporate Finance (Autumn/2)

3 hours per week; 13 weeks/5th semester; 26L/13L; ECTS credits:6

The course covers the more advanced capital budgeting, taking into account inflation, uncertainty and tax. Simulation and scenario analysis are covered. The concept of a real option is introduced. Agency theory, dividend policy and capital structure are all covered
in some detail. The capital markets are introduced, and approaches to share valuation are discussed. Portfolio theory is covered as a means of reducing risk.
Prerequisite FI4003.

FI4407   Financial Institutions and Markets* (Autumn/4)

3 hours per week; 13 weeks/7th semester; 26L/13T; ECTS credits:6

Overview of the financial system, financial markets; bond and equity markets, money markets, Euro markets, futures and options markets; introduction to financial institutions, theory of the banking system, bank regulation; band asset and liability management, bank liquidity management, bank credit risk management; financial innovations; securitisation, EU financial services and single market legislation; issues in portfolio management; transaction costs, regulation of investment services, active versus passive portfolio management, indexation, portfolio performance measurement.
Prerequisite FI4305

FI4417 Financial Strategy (Autumn/4)

3 hours per week; 13 weeks/7th semester; 26L/13T; ECTS credits:6

Introduction to Corporate Financial Strategy; Financial Planning; Agency Issues; Working Capital Management; Capital Structure; Advanced Capital Budgeting (Incl. APT, Real Options and APV); Financial Risk Management; Leasing and Securitisation; Venture Capital; Investor Relations; Organisational Issues; Mergers and Acquisitions.
Prerequisite FI4407

IN4003   Principles of Risk Management (Autumn/1)

3 hours per week; 13 weeks/1st semester; 26L/13L; ECTS credits:6

Concepts of risk, pure and speculative risk; paradigms of risk; risk communication; perceptions of risk; risk and regulation; risk and society; risk in the economic and legal environment; risk in a corporate context; probability and risk management; modelling risk management; portfolio theory and diversification; identification, analysis, evaluation, control, financing of risk; theory of risk retention; risk funding including alternative risk transfer; monitoring the process; financial models for the justification of risk management expenditure; risk management in an organisation; formulation and implementation of risk management strategies.

IN4005   Risk Analysis (Autumn/2)

3 hours per week; 13 weeks/5th semester; 26L/13L; ECTS credits:6

Decision making under conditions of uncertainty: Bayesian decision theory; economic value of information; Design of retention programme; probability of ruin; solvency concepts; Behavioural theories of accident prevention; role of heuristics; Control of intellectual property; reputation management; crisis management; Net present value & risk control/ derivation of annuity

formulae/ determination of discount rate. *Prerequisites: IN4004 and IN4014.*

**IN4007 Governance and Risk (Autumn/2)
(offered only in AY2009/10)**

3 hours per week; 13 weeks/3rd semester; 26L/13L; ECTS credits:6

Risk Management as a response to governance, the relationship between risk and governance, stakeholders and risk, governance and risk in an international context, risk and the structures of organisations, the control of risk through ethical, legal, economic, social, psychological and technical means. Codes of practice (Turnbull) and relevant regulation; Environmental risk and its control; Governance and compliance.

IN4015 Risk and Insurance
3 hours per week; 13 weeks/5th semester; 26L/13L; ECTS credits:6

Nature of Risk; insurance as a risk management device; statistical treatment of data, inferential statistics; utility theory and buyer behaviour, insurability; corporate demand for insurance. *Prerequisites IN4004 and IN4014.*

IN4305   Principles of Risk Management (Autumn/3)

4 hours per week; 13 weeks/5th semester; 26L/13T/13LAB; ECTS credits:6

Concepts of risk, pure and speculative risk; elementary risk theory; perceptions of risk; risk in the economic and legal environment; models of risk management; risk management as a decision making process; identification, analysis, evaluation, control, financing of risk; theory of risk retention, risk funding; monitoring the process; justification of risk management expenditure; captives; risk management in an organisation; formulation and implementation of risk management strategies; quality and risk management; disaster planning models.

IN4407 Risk Analysis (Autumn/4)

4 hours per week; 13 weeks/7th semester; 52L; ECTS credits:6

Principles of risk analysis; the concept of moral and physical hazards; quantative methods and risk analysis, use of statistical and probability theory; measurement and perception of risk; risk and human behaviour; models of risk and hazard identification and analysis, physical inspection, check lists, flow charts, hazard and operability studies, fault trees, hazard indices; simulations; scenarios; decision analysis; sensitivity analysis; project evaluation and risk; use of the computer in risk analysis. *Prerequisite IN4305*

IN4417 Risk and Insurance (Autumn/4)

3 hours per week; 13 weeks/7th semester; 26L/13T; ECTS credits:6

Risk theory and insurance; actuarial theory, ruin theory and insurance; classification of risk, liability, property, personal, and financial risk; the economic function of an insurance organisation; insurance as a means of risk financing; pure premium models; economics of insurance, the supply and demand for insurance; development of insurance in the economy; the theory of insurable risks; a typology of insurance and reinsurance; models of compulsory insurance.

IN4427 Insurance Organisations and Markets (Autumn/4)

3 hours per week; 13 weeks/7th semester; 26L/13T; ECTS credits:6

Risk theory and insurance; actuarial theory, ruin theory and insurance; classification of risk, liability, property, personal, and financial risk; the economic function of an insurance organisation; insurance as a means of risk financing; pure premium models; economics of insurance, the supply and demand for insurance; development of insurance in the economy; the theory of insurable risks; a typology of insurance and reinsurance; models of compulsory insurance.

IN4703 Risk Management (Autumn/2)

4 hours per week; 13 weeks/3th semester; 26L/13T/13L; ECTS credits:6

Introduction to risk and risk management; analysing the leisure industry risk; liability risk: negligence, professional liability, liability for goods and services, safety health and welfare, legal structure of organisations; property risk: fire, theft and embezzlement; personnel risk: pensions, keypersons and security practices; financial control of risk: internal financing, external financing including insurance and contracts; monitoring risk

IN4725 Risk and Insurance (Autumn/3)

4 hours per week; 13 weeks/5th semester; 52L; ECTS credits:6

Risk theory and insurance; risk analysis; classification of risk, liability, property, personal and financial risk; the economic function of an insurance organisation; insurance as a means of risk financing; pure premium models; economics of insurance, the supply and demand for insurance; development of insurance in the economy; the theory of insurable risks; a typology of insurance and reinsurance; models of compulsory insurance.

IN4735   Insurance Organisations (Autumn/3)

3 hours per week; 13 weeks/5th semester; 26L/13T; ECTS credits:6

The structure of the insurance industry; the functions of an insurance organisation; insurance organisation accounts and costing; the use of information technology; quality and insurance; captive management.

MG4031 Management Principles (Autumn/1)

3 hours per week; 13 weeks/1st semester; 26L/13T; ECTS credits:6

Management concepts and evolution, the business environment, functions of management, planning, organising, staffing, leading and controlling, decision making, organisation structure and design leadership, motivation, work design, organisational control introduction to ethics and social responsibility, change management.

MG4035 International Management (Autmn/2)

3 hours per week; 13 weeks/3rd semester; 26L/13T; ECTS credits:6

The domain of international management concepts of industry, location and firm specific advantage models

of cross-border business, managing multinationals mergers and acquisitions and strategic alliances, international business networks, coordinating international value chains, extended supply chain management, technology diffusion, subsidiary initiatives, political and cross-cultural issues, managing in developing countries.

MG4037 Strategic Management
(offered only in AY2009/10)

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.

MG4045 Change Management (Autumn/3)

3 hours per week; 13 weeks/5th semester; 26L/13T; ECTS credits:6

Nature of organizational change context specific change, managerial skills of change agents, change options and variables contextual analysis formulating and formation of implementation paths, mobilizing for change, change levers and interventions, strategic change frameworks, monitoring, control and resourcing change.

MG4047 Knowledge Management (Autumn/4)
(offered only in AY2009/10)

3 hours per week; 13 weeks/7th semester; 26L/13T; ECTS credits:6

This module introduces the student to the strategic role that information and knowledge play in modern organizations. The role of knowledge in organizations: a historical perspective. The nature of knowledge as an organizational capability: as object, as subject, as knowledgeability inherent in practice. Models and conceptual frameworks for knowledge management. The development of organizational structures to leverage knowledge. Knowledge management systems, knowledge codification, the transfer of knowledge at an individual, group, organizational and inter-organizational level. Cross-cultural issues for managing knowledge.

MI4001 Information Management 1 (Autumn/1)

3 hours per week; 13 weeks/1st semester; 26L/13T; ECTS credits:6

This module introduces the business student to a perspective of the organisation as an information processing system. It introduces organisational decision-making principles as a foundation for the design of Information Systems. It studies the role of data and database management as a corporate resource for decision making and the business systems that support this; data mining, ERPs, CRMs. It covers corporate responsibility for data integrity and protection.
The above concepts will be reinforced and developed through the use of appropriate software.

MI4305 Data and Decision Making in Organisations (Autmn/3)

5 hours per week; 13 weeks/5th semester; 26L/13T/26L; ECTS credits:6

This module introduces the business student to a perspective of the organisation as an information processing system. It introduces organisational decision-making principles as a foundation for the design of Information Systems. It studies the role of data and database management as a corporate resource for decision making and the business systems that support this; data mining, ERPs, CRMs. It covers corporate responsibility for data integrity and protection.

MI4407 Social & Organisational Aspects of Information Management (Autumn/4)

5 hours per week; 13 weeks/7th semester; 26L/13T/26L; ECTS credits:6

Provide a social and economic framework for understanding the nature and interaction of information, technology, people, and organisational components. Explain how IS can both constrain and enable organisations and explore the relationship between IS and organisational structure. Drawing on Structuration Theory and Institutional Economics the students will be provided with an understanding of the characteristics of the information economy. Consider the role of the Internet and networking technology in modern organisations. The above concepts will be reinforced and developed through the use of web and collaborative software.

MK4005 Marketing Intelligence (Autumn/3)

3 hours per week; 13 weeks/5th semester; 26L/13T; ECTS credits:6

Sources and Use of Marketing Intelligence; The Role of Research and Intelligence in the Marketing Organisation; Role of Marketing Information and Composition of Marketing Information Systems; Research for Marketing Decision Making; Approaches to Data Capture – Databases, EDI and Point-of-Sale; Marketing Research in Different Contexts; Research Methods; Commissioning and Evaluating Marketing Research.

MK4007 Applied Marketing 1
**(offered only in AY2009/10)   M&M
1-1-1**

Through the management of an extensive project students will be exposed to and should develop skills in relation to developing research objectives, creating a research design, and assembling a research proposal. Further, students will gain experience in data collection, interpretation and both in terms of primary and secondary sources. Finally, students will be expected to present research findings.

MK4017 Marketing Leadership
**(offered only in AY2009/10)   M&M
2-1-0**

Marketing vision, marketing planning, the marketing management process, the relationship between marketing and the other functional areas, the role of marketing in the boardroom, value-based marketing, internal marketing, organisational renewal through marketing.

MK4025 Marketing Communications (Autumn/3)

3 hours per week; 13 weeks/5th semester; 26L/13T; ECTS credits:6

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; the role of the media; communication vehicles; integrated marketing communications; the effects and effectiveness of marketing communications.

MG4101   Organisational Studies 1(Autumn/1)

4 hours per week; 13 weeks/1st semester; 26L/26T; ECTS credits:6

Organisational contexts and levels of analysis - the nature of business and organisations; introduction to and exploration of general organisational environments; individual and group processes within organisations: perception, learning; cognition, personality, stress, attitudes, social influence, motivation, group dynamics, consensus and conflict; methodologies for studying behaviour, criticisms and recommendations; introduction to organisation structures and processes.

MK4437 Channel Management & Retailing (Autumn/4)

3 hours per week; 13 weeks/7th semester; 26L/13T; ECTS credits:6

The nature of marketing channels. Channel flows. Tasks performed by marketing channels. Marketing channel participants. Channel structure. Channel strategy and design. Factors impacting on channel strategy. Power in marketing channels. Channel conflict. Negotiation in marketing channels. Channel management and leadership. Vertical marketing systems. Franchising. Evaluating channel performance. Channel dynamics and channel change. International distribution channels. Channels for services. Future distribution arrangements. The role of the wholesaler. Wholesaler types. The role of the retailer. Retail types. The competitive behaviour of retail institutions. The dynamic character of retail environments. Store location strategy. Store layout and facilities management. Retail merchandising. Retail information systems. The retail marketing mix. Consumer behaviour in the retail context. Customer communication in retailing. Retail marketing planning. *Prerequisite: MK4305*

MK4447 Product & Services Marketing (Autumn /4)

3 hours per week; 13 weeks/7th semester; 26L/13T; ECTS credits:6

Product concepts; product segmentation; product portfolios; new product development; product screening, product testing, market testing; inventory management; branding strategies; product management; economic role of services; characteristics of services; nature of the service experience; service product design; service facility design; managing service operations; customer expectations; service quality; customer retention; the human dimension in service management; corporate culture and service management; demand and the management of service capacity; pricing strategies in services; distribution of services; competitive strategies in service marketing. *Prerequisite MK4204*

MK4457 Selling & Sales Management (Autumn/4)

3 hours per week; 13 weeks/7th semester; 26L/13L; ECTS credits:6

Overview of personal selling, sales responsibilities and preparation, personal selling process, personal selling skills, negotiation techniques, territory management, account management and relationship marketing; overview of sales management, the planning process, sales structures and organisations, recruitment, selection and training of salespeople, motivation, organisation and compensation of salespeople, sales forecasting, telemarketing and the use of information technology in sales, management of sales promotions. *Prerequisite MK4204; MK4305*

MK4603   Marketing (Non-Business) (Autumn/2)

3 hours per week; 13 weeks/3rd semester; 26L/13T; ECTS credits:6

Marketing in society; strategic market planning; marketing information systems; new product development; pricing; promotion; channels of distribution; competition analysis; consumer behaviour services marketing; market segmentation, consumer research methods, identifying marketing information requirements; formulating research projects, the scientific method - its characteristics and practices, experimental research designs, attitude measurement, questionnaire design; marketing research applications: product research, advertising research, corporate image research, market testing; ethical issues in marketing research.

MN4003 Project Management (Autumn/1)

3 hours per week; 13 weeks/1st semester; 26L/13T; ECTS credits:6

Project process, project lifecycles, selection methods, stakeholder management, developing project objectives, initiating, scope definition, WBS, planning, controlling and closing out, estimating techniques, logic diagrams, CPM, PERT, developing schedules and budgets, allocating resources, tracking using earned value, progress reporting, change control, managing uncertainty, risk management, post implementation audits, introduction to project management software.

PM4003 Human Resource Management 1 (Autmn/1)

3 hours per week; 13 weeks/1st semester; 26L/13T; ECTS credits:6

The syllabus covers core issues surrounding managing people at work including critical perspectives on the enterprise; the processes of human resource planning, recruitment and selection; induction and socialisation; managing performance; work and job design; managing rewards; learning and development at work; from personnel to HRM.

PM4004 Employment Relations 1 (Spring/2)

3 hours per week; 13 weeks/8th semester; 26L/13T; ECTS credits:6

Approaches to studying and managing the employment relationship; trade unions and employer organisations in a societal and organisational context; the role and operation of state institutions; voluntarism and legalism in Irish employment relations; discipline, grievance, bullying, dignity and respect at work procedures; dismissals and equality legislation; collective bargaining and alternatives; management approaches to employment relations, public sector employment relations; national and workplace partnership; recent legislation on trade disputes and trade unions; the 1937

Irish Constitution; contemporary developments in employment relations.

PM4005 Management Consulting (Autumn/3)

3 hours per week; 13 weeks/5th semester; 26L/13T; ECTS credits:6

Defining management consultancy. The context of management consultant, management consultancy in the context of human resource management and development, applications of management consultancy, management of change, organisation development and training and development. The ethics, power and politics of management consulting. The key stages of the consultancy assignment; modules of management consultancy; the consultant as change agent; agreeing the consultancy brief; selecting and using data gathering techniques; analysing qualitative and quantitative data; selecting interventions; designing interventions; analysing performance gaps. Level of performance change required; establish, improve, maintain and extinguish using interventions to address each performance change; implementing interventions. Writing up the results of a management consultancy project. Presenting and defending your findings. Disengaging from the consultancy relationship.

PM4007 Organisation Behaviour 3 (Autumn/4)
(offered only in AY2009/10)

3 hours per week; 13 weeks/7th semester; 26L/13T; ECTS credits:6

Organisational theory and design. Power, influence and control. New organisational forms: market, hierarchy and network, virtual teams. Organisational culture and structure. The dynamics of organisational change and development.

PM4017 Human Resource Practice (Autumn/4)
(offered only in AY2009/10)

3 hours per week; 13 weeks/7th semester; 26L/13T; ECTS credits:6

Overview. Managing the individual employment relationship. Communication skills. Recruitment and selection process. Performance Management process. Legislative considerations in managing recruitment, selection, employee performance. Equality and dignity at work and work/life balance issues. Sourcing and applying regulatory information/documentation. Selection Interviewing role plays and feedback. Individual grievance and disciplinary management; disciplinary role-plays and feedback. Performance management systems, performance management case study.

PM4015 Employment Relations 2 (Autumn/3)

3 hours per week; 13 weeks/7th semester; 26L/13T; ECTS credits:6

Contexts concepts and values in Employment Relations. The nature of the employment relationship - The various theoretical approaches – Dunlop, Pluralism, Marxism and the Social Action approach -. The historical origins of Trade Unions and collective bargaining in Britain and Ireland and theories of trade union purpose. Conflict and Strikes Management Strategies in Employment Relations Human Resource Management the Non Union Firm and its effectiveness as an alternative to traditional methods of managing

employment relations Worker participation trade unions in the context of a democratic polity.

PM4027 Social Psychology of Organisations (Autumn/4)
(offered only in AY2009/10)

3 hours per week; 13 weeks/7th semester; 26L/13T; ECTS credits:6
Approaches to the study of social psychology; Culture, Society, Socialisation and Individual Freedom; The Construction of Attitudes, Values and Ideologies; The Landscape of Organisational Form in the Social World; Beyond Bureaucracy and the Rise of Modern Organisational Hegemony; The Boundaryless Organisation; Organisational Citizenship; Future Directions in the Social Psychology of Organisations.

PM4035 The Psychology of Work (Autumn/3)

3 hours per week; 13 weeks/7th semester; 26L/13T; ECTS credits:6

Exploring the reality of work; The meaning of work; Work Orientation; Employment and Unemployment; The psychological contract and the work socialization process; The changing context of work; Workforce Management; Changing Workforce Composition; Career Re-conceptualisation; Work Life Balance and Work Family Conflict.

PM4407 Industrial Relations 2 (Autumn/4)

3 hours per week; 13 weeks/7th semester; 26L/13LAB; ECTS credits:6

Industrial relations theory; the social action and systems approaches: frames of reference; unitarism, pluralism, radicalism and marxism: management strategies in industrial relations: comparative national industrial relations strategies including neo-corporatism, voluntarism and market control strategies in a comparative context: theories of conflict and conflict resolution: collective bargaining and alternatives such as employee participation and non-unionisation in a comparative context: trade unions; union growth and decline in selected countries, white collar unionism: reform of industrial relations - a critical view: labour market issues and structures: contemporary and industrial relations in selected countries. *Prerequisite PM4305*

PM4417 Personnel Management Practice (Autumn/4)

3 hours per week; 13 weeks/7th semester; 13L/26LAB; ECTS credits:6

Introduction to interviewing: theory and application of selection and interviewing techniques; the use of references, ratings, assessment centres and bio data - a critical examination; interviewing skills in the areas of selection, appraisal and counselling; the use and practice of psychological testing in the selection process: selecting tests; test manual evaluation; test norms using different types of tests/inventories. The law and selection - the 1977 Employment Equality Act.

PM4427 Employment Development 1 (Autumn/4)

3 hours per week; 13 weeks/7th semester; 26L/13LAB; ECTS credits:6

The context of employee development; culture, technology, environment, structure and management style: training, development and education: models of employee

development: establishing an employee development function: the role of the training and development specialist: designing learning interventions: identification of training needs: writing learning objectives: choosing learning methods: planning and delivering learning: learning transfer and evaluation of learning: the institutional framework: national policy and practice: role of state agencies: adult training and education: youth training initiatives: apprenticeships training: employee development and the single market.

PM4603 Employee Relations for Engineering/Science (Autumn/2)

2 hours per week; 13 weeks/3rd semester; 26L;ECTS credits:6

The employment of relationship; the individual and work groups; the basics of recruitment and selection; motivation techniques; effective supervisory and man management; industrial relations; communications in employee relations; the role of management and trade unions; line management and shop stewards; labour law; the basics of negotiation; national and local pay bargaining.

PM4613 Personnel Management 1 (Autumn/2)

3 hours per week; 13 weeks/3rd semester; 26L/13T; ECTS credits:6

Introduction to personnel management: line versus staff role in personnel management: manpower planning: recruitment and selection: employee development: performance appraisal: reward systems: contract of employment: industrial relations framework.

TM4005 Critical Issues in Tourism (Autumn/3)

3 hours per week; 13 weeks/5th semester; 26L/13LAB; ECTS credits:6

Tourism as a social phenomenon; the changing nature of travel; social and psychological factors influencing participation; the desire to travel; tourist – host interaction; tourist – destination interaction; traditional and modern forms of tourism; destination decision-making process; national identity and tourism imagery; the concept of free-time in contemporary society.

TM4007 Irish Tourism Analysis (Autumn/4) (offered only in AY2009/10)

3 hours per week; 13 weeks/7th semester; 26L/13LAB; ECTS credits:6

Defining tourism; organisation of the Irish tourism industry and its main stakeholders; Irish tourism data collection and analyses of the key tourism performance indicators; customer and market segmentation of both inbound and outbound visitors; Irish tourism policy development and review; government intervention; marketing evaluation; North-South tourism developments; the role of the EU; investing in tourism attractions, quality issues in tourism; the labour market and tourism, access transport and tour operators; industry analysis and profitability; tourism forecasts

TX4305 Taxation Theory and Practice (Autumn/3)

3 hours per week; 13 weeks/5th semester; 26L/13T; ECTS credits:6

Tax theory, basic concepts; public failure and public expenditure growth; cannons of taxation; structure and administration of the taxation system, assessment, appeals, collection, audit and penalties; computation of personal income tax liability; efficient employee remuneration, benefits in kind, employee share schemes, the PAYE system; taxation of investment income, from financial instruments, dividends and real property; the business expansion scheme; tax planning, review of the tax based incentives; the Irish/UK double taxation treaty.
Prerequisite AC4203

Kemmy Business School - Spring

AC4002 Managerial Accounting (Spring/1)

4 hours per week; 13 weeks/8th semester; 26L/13T/13L; ECTS credits:6

The module introduces students to the nature, basic techniques, language and principles of modern cost and management accounting. The role of the management accountant in the management process is considered in the context of a dynamic business environment. In particular, the use of accounting information in the internal decision making process of an organisation as well as recent developments in management accounting.

AC4004 Accounting & Auditing Frameworks (Spring/2)

3 hours per week; 13 weeks/8th semester; 26L/13T; ECTS credits:6

This module develops students understanding of the various historical, governance, regulatory and political contexts within which accounting operates. It is intended to give them an understanding of the broader considerations that impinge upon accounting and auditing policy and practice. It also extends students understanding of the broader frameworks within which accounting operates. Finally it addresses similar issues relating to auditing. *Prerequisite AC4001.*

AC4008 Management Accounting 2 *(Spring/2)
(offered only in AY2009/10)

3 hours per week; 13 weeks/4th semester; 26L/13T; ECTS credits:6

Political nature of accounting and governance; Corporate Governance: history, development and future; international and political contexts; approaches to governance; Cadbury, Greenbury, Hampel; Turnbury, Higgs etc.; Stakeholder theory; impact of governance developments on accounting and auditing; boards and non-executive directors; Corporate Social Reporting; Accounting for business combinations, merger and acquisition accounting, equity accounting; Goodwill and fair values; Public sector accounting; Frauds and forensic accounting; Current issues; Ethics and ethical issues in accounting. *Prerequisite AC4305: Financial Information Analysis.*

AC4014 Intermediate Accounting 1 (Spring/2)

3 hours per week; 13 weeks/4th semester; 26L/13T; ECTS credits:6

Specific topics to be covered include: Inventories (IAS 2); Construction Contracts (IAS 11); Income measurement and asset valuation; Accounting for changing price levels; Property, Plant & Equipment (IAS 16): Impairment of Assets (IAS 36); Accounting for Investment Properties (SSAP 19); Intangible Assets (IAS 38) ; Accounting for Research & Development; Substance over form. *(Prerequisite: AC4001 Principles of Accounting).*

AC4214 Accounting for Financial Decision Making (Spring/2)

3 hours per week; 13 weeks/8th semester; 26L/13T; ECTS credits:6

This module introduces the non-business student to the fundamental concepts and practices of management accounting and finance. Management accounting provides information for product/service costing and profit determination in addition to information for planning, control and decision-making. Finance is concerned with the ways in which funds for a business are raised and invested. The topics covered include the relationship between financial and management accurement accounting, costing, budgeting, short-term decision making, strategic management accounting, sources of finance, investment appraisal and management of working capital. This module is designed to be a prerequisite for the module AC4417 Management Accounting 1.

AC4408   Auditing & Advanced Accounting Practice (Spring/4)

3 hours per week; 13 weeks/8th semester; 26L/13T; ECTS credits:6

Group accounts and consolidated statements, merger and acquisition accounting, equity accounting, proportional consolidation: (SSAP's 1, 14, 22, 23, FRS 2); Goodwill and fairvalues (SSAP22, IAS22). Group Cash-flow Statements (FRS 1), Branches and joint ventures. Foreign currency transactions and translation: (SSAP 20). New financial instruments. Corporate Governance. Public sector accounting. Auditing practices and procedures: auditing guidelines and concepts, auditing and information technology.

AC4418   Management Accounting 2 (Spring/4)

3 hours per week; 13 weeks/8th semester; 26L/13T; ECTS credits:6

Information for planning and control; budgeting and budgetary control; standard costing and variance analysis; behavioural aspects of accounting control systems; management accounting systems and advanced manufacturing strategies/techniques; decentralisation and performance measurement; transfer pricing; accounting control systems; past, current and future developments in management accounting.

EC4002   History of Economic Thought (Spring/1)

3 hours per week; 13 weeks/1st/2ndSemester; 26L/13T; ECTS credits:6

Early pre-classical economic thought (Aristotle, St Thomas Aquinas). Mercantilism (J. Hales, Bodin and Campanella). The Physiocrats (F. Quesnay). Classical Economic Thought (Smith, Ricardo, Malthus, Mill and Say). Neo-classical economic thought: the development of Marginal Analysis (Jevons, Menger and Walras). Leon Walras and General Equilibrium Analysis. Early critics of neo-classicism (the new definition of the economic optimum by V. Pareto). The building of Socialist thinking (Fourier, Owen, Sismondi, Proudhon and Marx). The development of modern Economic Thought (Austrian school; Keynes). Recent economic thought (Leontief and empirical analysis).

EC4004   Economics for Business   (Spring/2)

3 hours per week; 13 weeks/1st/2ndSemester; 26L/13T; ECTS credits:6

Short-run and long-run cost curve analysis; The Economics of market power; Monopolistic competition; Oligopoly; Game theory; Labour demand and the investment decision; Labour supply; Firms' objectives and behaviour; The role of government and the firm; The expectations-augmented Phillips curve, purchasing power parity, interest rate parity, the Fisher effect, open economy monetary model and the factors underlying the "Celtic Tiger" period.

EC4006   Intermediate Macroeconomics (Spring/3)

3 hours per week; 13 weeks/1st/2ndSemester; 26L/13T; ECTS credits:6

The labour market and the extended Keynesian, Classical model; The Phillips curve and the inflation-unemployment trade-off; Purchasing power parity; Covered and uncovered interest rate parity theory; Open economy monetary model; Economic adjustment given the constraints imposed by

EMU membership; The Design of the European Central Bank (ECB); The ECB's monetary policy; The ECB and interest rate policy; The ECB and exchange rate policy; The economic performance of the Irish economy in the long-run.

EC4014 International Economics (Spring/2)

3 hours per week; 13 weeks/1st/4th Semester; 26L/13T; ECTS credits:6

The world economy: recent trends in trade and capital flows Traditional trade theories, The Mercantilists, Smith, Ricardo, Heckscher-Ohlin,
Modern trade theories, Monopolistic Competition and Imperfect Competition Trade policy; theory of Tariffs, Non-tariff barriers Trade policy; practice, The political economy of trade policy, Strategic trade policy International production factors: labour and capital mobility, the welfare effects of labour and capital mobility. Foreign Direct Investment and the Multinational Corporation, Theories explaining NCs and FDI. *Prerequisites EC4101, EC4102 and EC4004.*

EC4018 Monetary Economics (Spring/4)
(offered only in AY2009/10)

3 hours per week; 13 weeks/1st/8th Semester; 26L/13T; ECTS credits:6

The main topics included in the syllabus are: The Design of the European Central Bank; The ECB's Monetary Policy; Controlling the Money Supply; Interest Rate Determination and Policy; The Growth and Stability Pact; Exchange Rate Determination and Policy; Open Economy; Monetary Model; Economic Adjustment in a Monetary Union; The Economic Performance of the ECB.

EC4024 Financial Economics (Spring/2)
3 hours per week; 13 weeks/4th Semester; 26L/13T; ECTS credits:6

This module is concerned with issues in global financial management. Among the topics examined are: the international monetary system, the foreign exchange market, measuring and managing foreign exchange exposure, financing the global firm, managing multinational operations and foreign investment decisions. *Prerequisites EC4101, EC4102 and EC4004.*

EC4102 Macroeconomics (Spring/1)

3 hours per week; 13 weeks/2nd semester; 26L/13T; ECTS credits:6

Introduction (national income; business cycle; inflation; unemployment; balance of payments); the theory of income determination: basic model; fiscal policy: the Irish experience, 1973 - 93; money and banking: monetary policy; monetary versus fiscal policy, crowding-out, quantity theory of money, IS/LM model in closed economy; the balance of payments and exchange rate theory: fixed and floating exchange rates: fixed exchange rate systems; road to EMU, costs and benefits of EMU to Ireland, enlarged community, EFTA, eastern Europe and the EU.

EC4108 Contemporary Issues in the Global Economy
(offered only in AY2009/10)

3 hours per week; 13 weeks/2nd semester; 26L/13T; ECTS credits:6
Economic versus Human Development; Economic Performance of Less Developed Countries, Population and Economic Development; Income Distribution and Poverty; Migration patterns and their effects; Globalisation and International Trade; The effects of trade on wages and labour standards; International financial movements; The role of outsourcing and offshoring; The role of the US Dollar and US Current Account Deficits in the world economy.

EC4112 Macroeconomics (for Non-business) (Autumn/1)

3 hours per week; 13 weeks/2nd semester; 26L/13T;ECTS credits:6

National income; business cycle; inflation; unemployment; balance of payments; income determination; basic model; fiscal policy; the Irish experience, 1973-93; money and banking; monetary policy; monetary versus fiscal policy; crowding-out, quantity theory of money, IS/LM model in closed economy; the balance of payments and exchange rate theory; fixed and floating exchange rates; fixed exchange rate systems; road to EMU, costs and benefits of EMU to Ireland, enlarged community, EFTA, Eastern Europe and the EU.

EC4408 Public Finance (Spring/4)

3 hours per week; 13 weeks/8th semester; 26L/13T;ECTS credits:6

Market possibilities and prescriptions; evaluating public finance policy; collective decision making: market failures and government intervention; searching for the public good; evaluation of public production and bureaucracy and public expenditure; tax theory - basic concepts; income (re) distribution; fiscal aspects of macroeconomic theories; international issues in public finance; public failure and public expenditure growth; 'normative' optimal taxation; 'positive' optimal taxation; the 'traditional' versus the public choice approach - public finance analysis and the policy-makers.

EC4418 Monetary Economics and International Finance (Spring/4)

4 hours per week; 13 weeks/8th semester; 26L/26T; ECTS credits:6

IS-LM model and the balance of payments, Mundell-Fleming model, exchange rate policy; open economy model; foreign exchange market, the forward market, forward market efficiency; interest rate parity theory, exchange rate expectations, international fisher theory; futures and options markets, currency options - Garman Kolhagen model; international portfolio diversification; application FO futures and options in portfolio management.

EC4711 EU Economic Environment (Spring/1)

4 hours per week; 13 weeks/1st semester; 26L/26T; ECTS credits:6

Theory of Economic Integration and Customs Unions; The European Monetary System; Economic and Monetary Union. Monetary integration theory and evidence of convergence within the EC. Prospects for 'widening' the European Union; regional Integration-global trends.

FI4008 Empirical Finance*
(offered only in AY2009/10)
3 hours per week; 13 weeks/8th semester; 26L/13L;ECTS credits:6

Introduction to the theory of empirical finance – the study of financial market decision-making using sample data. Applications in financial modelling: forecasting and simulation. Applications in portfolio management: evaluating the risk-return trade-off and the measurement of portfolio risk. Applications in derivative security valuation: simulated trading and risk-management in an interactive virtual financial markets environment. Applications in risk management: calculation of portfolio value-at-risk under 'event-driven' simulated market conditions. *Prerequisite FI4407 Financial Institutions and Markets and FI4007 Investments: Analysis and Management.*

FI4408 Advanced Topics in Finance (Spring/4)

3 hours per week; 13 weeks/8th semester; 26L/13T;ECTS credits:6

Trends in portfolio management, active and passive management. Changing institutional features of capital markets - move to OTC markets. The structure of European capital markets. Portfolio performance measurement - selectivity and market timing. Hendrickson-Merton timing model; the crash of 1987 - the cascase theory. New financial instruments - CMOs, IOs and POs, Stripe, Junk Bonds. Hybrid financial instruments. Current issues in corporate finance - LBOs, MBOs, performance of highly leveraged transactions, executive compensation, compensation and performance.

IN4004 Insurance Law and Claims   (Spring/2)
3 hours per week; 13 weeks/4th semester; 26L/13T; ECTS credits:6

This module provides the student with insights into the law of insurance and the assessment of all classes of losses. It deals with the investigation of losses and incidents for the purpose of preparing cases for court, confirming cover under the contract and ascertaining how losses can be prevented. *Prerequisite IN4003.*

IN4008 Reinsurance/ART (Spring/4)
(offered only in AY2009/10

3 hours per week; 13 weeks/8th semester; 26L/13T; ECTS credits:6

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. Statistical analysis of pure risk exposures, including computer based simulations of possible loss scenarios; selection of relevant risk transfer measures; underwriting techniques - exposure analysis; use of market indices; exercises in reinsurance/alternative risk transfer programming.

IN4014 Life Insurance (Spring/2)

3 hours per week; 13 weeks/4th semester; 26L/13T; ECTS credits:6

The module includes; the history and importance of life insurance, analysis of term insurance, whole of life insurance and endowment insurance, health insurance, the Irish social insurance system, retirement and pensions, demographics and life insurance, the life insurance contract, life insurance underwriting, underwriting of diseases that affect the human anatomy, theory of mortality and morbidity risk, the use and formulation of mortality tables, premium models for term, whole of life, endowment and annuity. *Prerequisite IN4003.*

IN4408   Insurance Law and Claims (Spring/4)

3 hours per week; 13 weeks/8th semester; 26L/13T; ECTS credits:6

The principles of claims management, claims as an economic cost, mathematical principles of claims reserving; law of contract, law of insurance, the insurance contract, insurable interest, utmost good faith, indemnity, subrogation, contribution, proximate cause, interpretation of the insurance contract; codes of practice; law of agency; principles of valuing losses, property, loss of profits, civil damages, legal fees; human relations in handling claims, conflict resolution; principles of loss investigation, theory of fraud detection.

IN4418   Risk Control and Underwriting (Spring/4)

3 hours per week; 13 weeks/8th semester; 26L/13T; ECTS credits:6

The theory of risk construction and separation, the principles of risk improvement and loss control, fire, theft and liability protection and prevention; actuarial methods and the theory of rating and underwriting; the management of an underwriting portfolio, accumulation; the principles of acceptance and retention; the principles of reinsurance, setting of net retention's, structuring of a reinsurance programme.

IN4428   Life Insurance (Spring/4)

4 hours per week; 13 weeks/8th semester; 26L/13T/13LAB; ECTS credits:6

The theory of financial planning, protection, savings and investment, pensions; the effect of taxation on the financial plan; the theory of insurance in fulfilling the financial plan, life, health and personal accident insurance; pensions; the mathematical theory of life contingencies; force of mortality; the importance of interest; premiums and reserves for annuities and insurance based on a single life; the formulation of mortality tables; underwriting the life insurance policy; principles of assessing degrees of extra risk; the concept of forfeiture, surrender values, paid up policies; principles of social insurance.

IN4718 Reinsurance and alternative risk transfer - A decision making approach (Spring/4)

3 hours per week; 13 weeks/8th semester; 26L/13Lab; ECTS credits:6

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 - exposure analysis; use of market indices; exercises in reinsurance/alternative risk transfer programming.
Prerequisite: IN4716.

IN4728   Insurance Information Systems (Spring/4)

4 hours per week; 13 weeks/8th semester; 26L/13T/13Lab; ECTS credits:6

The need for information to assess risk, the obtaining of information, environmental pressures to use information technology, the use of information technology in risk financing, networks in insurance, the strategic use of networks, expert systems, usage of expert systems in risk financing, management of information, evaluating technological investment, protecting the investment, security of information, the need to link business and IT strategies. *Prerequisite: IN4716.*

IN4738   International Insurance (Spring/4)

4 hours per week; 13 weeks/8th semester; 52L; ECTS ECTS credits:6

The function of Insurance is an international market, marine insurance, aviation insurance, transit insurance; the development of a common insurance market in Europe, insurance directives, harmonisation of legal provisions relating to insurance; GATT; Globalisation of insurance, marketing of insurance across borders, international barriers to entry; a

review and comparison of a selection of international insurance and reinsurance markets.

IN4748 Life Insurance and Financial Planning (Spring/4)

4 hours per week; 13 weeks/8th semester; 26L/13T/13LAB;ECTS credits:6

The theory of financial planning, savings and investments, pensions; the effect of taxation on the financial plan; the theory of insurance in fulfilling the financial plan, life, health and personal accident insurance; pensions; underwriting the life and health insurance policy; principles of assessing degrees of extra risk; the concept of forfeiture, surrender values, paid up policies; principles of estate planning, trusts; principles of ownership of a policy; principles of social insurance.

MG4038 Sustainable Development (Spring/4)
(offered only in AY2009/10)

4 hours per week; 13 weeks/8th semester; 26L/13T/13LAB;ECTS credits:6

Theories and policies of sustainability. The status of the global natural resource base. The EU approach to Sustainability: the Lisbon objectives their realisation and impact on creating a sustainable economy; social dialogue and civil society in differing regions of Europe; progress in implementing social dialogue objectives. Globalisation and the EU Social Dialogue process: the US model; the impact of EU policies on third world countries. Corporate responsibility Corporate environmental management, sustainable consumption, Business ethics and corporate social responsibility, sustainable, enterprise, green marketing, cause-related marketing, sustainability reporting, socially responsible investment, fair trade, child and low cost labour, sustainable communication.

MG4048 Contemporary Management Practice
(Spring/4)
(offered only in AY2009/10)

3 hours per week; 13 weeks/8th semester; 26L/13T/;ECTS credits:6

Note – this module is contingent and will vary in content from year to year depending on the major issues in the world of management at time of delivery. Current examples would be: Restoration of Stakeholder Trust; Managing lean organisations; Structuring business for unstable markets and Communication strategies in crisis and turnaround management.

MG4408 Strategic Management (Spring/4)

3 hours per week; 13 weeks/8th semester; 26L/13T; ECTS credits:6

The nature and importance of strategic management; strategic management as a dynamic, interactive process; models of the strategic management process; the nature of competition and the meaning of competitive advantage; the role and influence of stakeholders on the strategic management process; establishing corporate missions and setting objectives; environmental analysis; developing environmental threat and opportunity profiles; internal strategic audits, including value-chain analysis, and developing strategic advantage profiles; corporate grand strategies and strategic business unit generic strategies; strategy choice and decision-making, including portfolio analysis and decision-support systems; strategy implementation and control processes and systems.

MG4604 Air Transportation (Spring/2)

4 hours per week; 13 weeks/4th semester; 26L/26T; ECTS credits:6

History of air transport, national and international regulations for civil aviation and the deregulation of the environment; overview of the world-wide industry; air transport, airports, aerospace manufacturing, maintenance, financial and other aviation services; airline planning ,scheduling, pricing, fares, passenger demand ,costs, aircraft and route selection; current issues and future prospects of the air transport industry.

MI4002 Business Information Management (Spring/1)
5 hours per week; 13 weeks/4th semester; 26L/13T/26L; ECTS credits:6
This course will provide an economic and social framework for understanding the nature and interaction of information, technology, people, and organizational components; the role of the Internet and networking technology in modern organization; the evolution of e-business and the transformation of organizations and markets; business systems as both constraining and enabling organizations; the relationship between business systems and an organizations social structure; information and knowledge as a strategic resource in organizations; systems use for semi-structured decision-making management of international business systems.

MI4408 Knowledge Management and Strategy
(Spring/4)

3 hours per week; 13 weeks/8th semester; 26L13T; ECTS credits:6
This module introduces the business student to a strategic perspective on the role of knowledge, information and technology in organisations. It studies the role of technology and infrastructure in organisational transformation. It presents frameworks for the planning and implementation of information as a competitive resource. It provides an appreciation of the need to manage knowledge as an organisational resource and the infrastructural requirements to facilitate   this.
The above concepts will be reinforced and developed through the use of various software packages including web, intranet and knowledge portal software systems.

MK4002 Marketing (Spring/1)

3 hours per week; 13 weeks/2nd semester; 26L13T; ECTS credits:6
Nature of Marketing; Histories of Marketing; Marketing Concept; Marketing Mix; Marketing as Organisational Culture, Market Orientation; Barriers to Market Orientation; Marketing in different contexts. The Consumer; Consumer Sovereignty; Consumer Rights; The Consumer Movement; Marketing, Ethics and Social Responsibility; How Marketing Adds Value; Marketing's Contribution.

MK4004 Consumption & Consumer Culture (Spring/2)
3 hours per week; 13 weeks/4th semester; 26L13T; ECTS credits:6

The Circle of Consumption; The Meaning & Nature of Culture; Consumption Meanings; Consumption & Marketing Strategies; Identity & Consumption; Embodiment & Consumption; Motivation & Involvement; Experience, Learning & Knowledge; Approaches to Consumption; Purchase Behaviour; Gift Giving; Organisational Consumption; Family & Household Consumption; Interpersonal Influence; Innovation; Compulsive Consumption; Disposition.

MK4008 applied Marketing 2 (Spring/4)
(offered only in AY2009/10)

4 hours per week; 13 weeks/4th semester; 13L/13T/13L; ECTS credits:6

Through applied project work students will be exposed to project planning and management, the effective use of communication channel(s), and sales and negotiation processes. The module also addresses stakeholder

communications and culminates in the delivery of presentation skills, both written and oral.

MK4014 Branding (Spring/2)
3 hours per week; 13 weeks/4th semester; 26L13T; ECTS credits:6

The syllabus presents, in the first instance, a review of the history and origins of branding. This provides context for the subsequent discussion of the role and importance of branding. Next, students are introduced to the processes of segmentation, targeting and positioning. Brand building activities are reviewed with consideration given to strategic brand management, comparative analyses of brand image and brand concept, and an exploration of brands as assets. Finally, branding in discussed in terms of how it relates to different marketing contexts: service brands; industrial brands; retailer brands; international brands and corporate brands. *Prerequisite MK4002.*

MK4018 Interaction, Relationships and Networks (offered only in AY2009/10) (Spring/4)

3 hours per week; 13 weeks/8th semester; 26L13T; ECTS credits:6

Motivation for the development of relational approaches to marketing. Relationship life-cycle models. Interaction and Relationships in service contexts.   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.

MK4408 Marketing Management (Spring/4)

3 hours per week; 13 weeks/8th semester; 26L/13T; ECTS credits:6

Marketing and the marketing management process, the strategic role of marketing, market opportunity analysis, industry and competitor analysis, developing strategic and operational marketing programmes, the marketing plan, implementation and control: structuring for marketing effectiveness; comparative analysis of functional, product, market and geographic organisational structures: introduction of the model building approach in marketing.

MK4438 Electronic and International Marketing (Spring/4)

3 hours per week; 13 weeks/8th semester; 26L/13T; ECTS credits:6

Electronic marketing, introduction to marketing on the internet, product and pricing on the internet, the internet as a distribution channel, marketing communications on the internet, interactive advertising, relationship marketing through online strategies, developing and website and designing a web presence, online marketing strategies; introduction to international marketing, the international marketing environment, market entry strategies, developing products for international markets, pricing in international markets, managing international channels, international promotion strategies, planning and organising for international marketing. *Prerequisite MK4204; MK4315; MK4305*

MK4448 Marketing Communications (Spring/4)

3 hours per week; 13 weeks/8th semester; 26L/13T; ECTS credits:6

Role of communications in marketing strategy, communications theory, how advertising works, the management of marketing communications, the advertising industry, creative aspects of advertising, media aspects of advertising, advertising research and testing, ethics and advertising standards, sponsorship, public relations, direct marketing, consumer sales promotions, trade shows and exhibitions, use of the internet as a marketing communications tool, internal marketing communications,

integrated marketing communications, the effects and effectiveness of marketing communications. *Prerequisite MK4204, MK4305, MK4315*

MK4606 Marketing in Equine Industry (Spring/3)

4 hours per week; 13 weeks/6th semester; 39L/13T;ECTS credits:6

Marketing research application in equine industry: evaluation of market research methodologies. Critical analysis of the role of channels and of "key players" in the distribution/buyer-seller system. Marketing interaction with the other functional areas: management of market operations. Pricing policies of particular application to the equine industry. Marketing communications, including promotion options: corporate image and positioning. Customer competition and company analysis models. Features of marketing in international markets vs. home market dependency: adapting to cultural, legal and other environmental factors, overseas.
Searching and evaluating new product ideas: marketing's role in the "new enterprise" process, from idea generation to commercialisation and on-going development. The relevance of quality control, e.g. with regard to genetics/breeding, grooming, etc. to the marketing programme. Development of strategies applicable to the equine sector, e.g. market segmentation, branding, strategic alliances and integration of the industry. Contribution of marketing to policy formulation and corporate planning.

PM4002 Organisational Behaviour 1 (Spring/1)

3 hours per week; 13 weeks/2nd semester; 26L/13T; ECTS credits:6

Organisational Behaviour in perspective; Personality; Perception and Cognition; Learning & the Individual; Emotion, Stress & Psychological Well being; Communication and the individual; Groups & Team Roles; Organisational Power and Politics; Organisational Development.

PM4004 Employment Relations 1 (Spring/2)

3 hours per week; 13 weeks/8th semester; 26L/13T; ECTS credits:6

Approaches to studying and managing the employment relationship; trade unions and employer organisations in a societal and organisational context; the role and operation of state institutions; voluntarism and legalism in Irish employment relations; discipline, grievance, bullying, dignity and respect at work procedures; dismissals and equality legislation; collective bargaining and alternatives; management approaches to employment relations, public sector employment relations; national and workplace partnership; recent legislation on trade disputes and trade unions; the 1937 Irish Constitution; contemporary developments in employment relations.

PM4008 Employment Relations Practice (Spring/4) (offered only in AY2009/10)

4 hours per week; 13 weeks/8th semester; 26L/26L; ECTS credits:6
*Theoretical content***:** An introduction to the theory and practice of negotiation. The role of procedural regulation in discipline and grievance administration in the workplace. The management of employment relations legislation. Third party interventions in employment relations.

*Practical skill comprising the following***:** Effective interaction with in employees in the area of bullying and dignity and respect. Skills development in the following areas: interviewing skills, case presentation, active listening, team preparation and organisation. The preparation and submission of cases to third parties.

PM4014 Human Resource Development (Spring/2)

3 hours per week; 13 weeks/4th semester; 26L/13T; ECTS credits:6

The organisational process of developing people at work; rationale for HRD; individual and organisational learning; identifying learning needs; designing learning events; delivering effective learning events; evaluating outcomes; careers and career management; management development; life-long and continuous learning.

PM4024 Organisational Behaviour 2   (Spring/2)

3 hours per week; 13 weeks/8th semester; 26L/13T; ECTS credits:6

The syllabus covers core issues relating to organisational behaviour in the workplace focusing on the individual and the group within the organisation. It explores the following areas: the development of the individual; personality and individual difference, Myers Briggs Type Inventory (MBTI), perception, attitudes and motivation.   Group development and dynamics are examined including the dynamics of groups and teams, communication, inter and intra-group conflict, organisational learning and organisational leadership.

PM4028 Psychometrics and Psychological Testing (Spring/4)
(offered only in AY2009/10)

3 hours per week; 13 weeks/8th semester; 26L/13T; ECTS credits:6
Key psychometrics concepts, measurement testing, norming, reliability and validity, statistical processes and methods relevant to psychometrics. Different types of tests: aptitude, ability, attainment, personality and career inventories, selecting tests for selection, development and career purposes, evaluating the contents of a test manual, test administration, test scoring and evaluation, evaluating different types of test. Concepts of personality, personality inventories and measurement, career inventories, the status of testing in selection, development and careers; Ethical issues in testing, integration of testing in broader assessment and bias and its avoidance.

PM4038 Human Resource Management 2 (Spring/4)
(offered only in AY2009/10)

3 hours per week; 13 weeks/8th semester; 26L/13T; ECTS credits:6

The syllabus covers the origins of HRM and the factors that have enhanced the strategic importance of people in organisations. The recent emphasis and various theoretical perspectives on HRM as a critical factor in organisational performance are examined. The concept of HRM strategy is examined with regard to a number of workplace issues including the management of employment relations, new employment relations, flexible work practices and work-life balance and employee participation and involvement. HRM and its ability to deliver organisational justice for employees is considered and the contribution of the HR department to ethics and corporate social responsibility. Finally, the problems of measuring the HR contribution to organisational effectiveness and efficiency are considered.

PM4408   Personnel Management 2 (Spring/4)

4 hours per week; 13 weeks/8th semester; 26L/26T; ECTS credits:6

The nature of organisations and organisation theory: organisations as systems: life cycle perspectives: political perspectives: the philosophy of organisation theory: the external environment: organisation structure and design: decision making process: organisation technology: information and control systems: organisational learning systems: the development of individuals: continuous development in organisations: self development systems in organisations: organisation development: innovation and change: changing corporate cultures.

PM4418 Industrial Relations Practice (Spring/4)

4 hours per week; 13 weeks/8th semester; 26L/26T; ECTS credits:6

Interviewing skills in the area of discipline and grievance administration; the law and disciplinary and grievances; preparation research and team selection for negotiation; the negotiation process; presenting a case to a third party; models of the theory and practice of collective bargaining; national pay determination, theoretical and practical issues; pay determination in non-union companies.

N.B. Numbers are restricted on PM4418. Fluency in English is a requirement because role-play forms a part of the assessment.

PM4428 Organisation Behaviour (Spring/4)

4 hours per week; 13 weeks/8th semester; 26L/26T; ECTS credits:6

The nature of organisations and organisation theory: organisations as systems: life cycle perspectives: political perspectives: the philosophy of organisation theory: the external environment: organisation structure and design: decision making process: organisation technology: information and control systems: organisational learning systems: the development of individuals: continuous development in organisations: self development systems in organisations: organisation development: innovation and change: changing corporate cultures.

PM4902 Women Management and Organisations (Spring/1)

3 hours per week; 13 weeks/2nd semester; 26L/13T; ECTS credits:6

The social construction of gender differences and gender identity in organisations; gender expectations at work; sex role stereotyping at work; the 'gendering' of organisations and its implications for organisational behaviour; leadership and management style differentials in the workplace; organisational cultures and climates; power distribution and political behaviour at work; traditional organisational structures and gender sensitive critiques of bureaucratic forms; workplace demographics, trends and female workforce participation; issues relating to job-sharing, flexitime, extended leave and maternity leave.

TX4407   Corporate Taxation (Spring/4)

3 hours per week; 13 weeks/8th semester; 26L/13T; ECTS credits:6

Corporate Tax; tax implications of incorporation; computation of the corporation tax liability; manufacturing relief, meaning of manufacture, extended definitions of goods; debt and equity, tax implications; dividend policy and advance corporation tax, company distributions; loss relief for companies including excess payments of ACT and excess charges; group relief for losses, charges and ACT; close companies, definition and consequences; tax planning for companies including restructuring of companies to maximise tax reliefs; capital gains tax: computation of capital gains and allowable expenses for companies and individuals; reliefs and exemptions; losses and company group reliefs; valued added tax: general principles and administration, registration and de-registration, exemptions and zero rating; inter EU sales and purchases.'

FACULTY OF EDUCATION AND HEALTH SCIENCES

Dean, Professor Mary O'Sullivan

Department/College Information

The Faculty of Education and Health Sciences comprises of the Department of Education and Professional Studies and Mary Immaculate College, Physical Education and Sports Science, Occupational Therapy, Speech and Language Therapy, Medical School, Nursing and Midwifery, Physiotherapy, Psychology.

Erasmus Academic Coordinators

Physical Education	Dr Aine McNamara
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Undergraduate Degree Programmes Offered

Bachelor of Science in Physical Education
Bachelor of Science (Education) in Biological Sciences with Physics OR Chemistry
Bachelor of Technology (Education) in Materials and Construction Technology
Bachelor of Technology (Education) in Materials and Engineering Technology
Bachelor of Science (Education) in Physics AND Chemistry
Bachelor of Science in Sport and Exercise Sciences
Bachelor of Science in Physical Education
Bachelor of Science in Food Science and Health
Bachelor of Science in Health and Safety
Bachelor of Science in Physiotherapy
Bachelor of Science in Nursing (General)
Bachelor of Science in Nursing (Mental Health)
Bachelor of Science in Nursing (Intellectual Disability)
Certificate/Diploma in Equine Science
Higher Diploma (Midwifery) Higher Diploma in Peri-operative Nursing
Bachelor of Medicine, Bachelor of Surgery (Graduate Entry)

Faculty of Education and Health Sciences (Autumn)

Education Modules

EN4001 Introduction to Teaching (Autumn/1)

5 hours per week; 13 weeks/1st semester; 26L/13T/26LAB; ECTS credits:6

Participants will be able to develop the personal and technical skills to enable them to fulfil their role as facilitators of learning, though an emphasis on small-group work and through the strategies of micro-teaching in an enquiry-oriented, reflective approach. They will study and implement the following elements of the teaching role: the nature of teaching and learning, by self planning and preparation, lesson presentation skills, using questioning, group work, independent studies, lesson management, equity, classroom climate, assessment, reflection and evaluation.

EN4003 The Planning & Management of Classroom Learning (Autumn/2)

3 hours per week; 13 week/3rd semester; 26L/13T; ECTS credits:6

The Junior Certificate considered as a context for school learning and curriculum planning; the objectives model and the process model; using the models appropriately; assessment of student learning; curriculum evaluation; understanding the pupil from psychological, cognitive and humanistic perspectives; various theoretical and empirical approaches to learning and classroom management, learning styles; the social psychology of the classroom: roles, group dynamics, social interaction.
 Prerequisite EN4002

EN4005 Education and Society in Ireland. (Autumn/3)

3 hours per week; 13 weeks/5th semester; 26L/13T; ECTS credits:6

Introduction; the changing economic and occupational structure 1926-91; the changing social structure; the role of the state in education provision and control; the role of the churches in education provision and control; patterns of demand and provision; 1924-1956; patterns of demand and provision; 1956-1991; external influences; OECD, council of Europe and EU; reforming provision and control; 1960-90; assessing the significance of educational change.

EN4007 Studying School Organisation (Autumn/4)

3 hours per week; 13 weeks/7th semester; 13L/13T/13LAB;

The school as a social organisation; structure and organisation of schools; managerial bodies; church state relations in education; classification and framing of knowledge; ritual in education; co-education; selection and streaming; research methods in education.

Health Sciences Modules

PS4031 Psychology and Everyday Life 2-1-0Δ

This module will introduce students to a range of fundamental theoretical perspectives and issues in general psychology through examining their relevance in everyday life. Through exploring everyday issues students will not only learn about theoretical perspectives but will also gain a basic knowledge of how psychology may be applied. In addition, through exploring some key studies in psychology, students will gain a basic understanding of the main investigative techniques used by psychologists. The range of topics will include; definitions of psychology; attachment; sleep, eating aggression and biological basis of behaviour.

Numbers are limited on PS4031. The module is subject to availability on arrival at the University of Limerick.

PY4011 Physical Education Curriculum and Assessment Δ

                                          PESS
2-1-1

This module will examine physical education in contemporary Irish society, focussing on Junior Cycle, Senior Cycle and Leaving Certificate. Discussion of teaching styles, curriculum models and instructional models in physical education will be encouraged as will the rationale for assessment in physical education and examinable forms of the physical education subject in Scotland, Ireland, England and Wales, Australia.
Numbers are limited on PY4011. The module is subject to availability on arrival at the University of Limerick.

PY4031 Foundations of Teaching and Learning Physical Education Δ

                                          PESS
2-1-1
The module will examine possible models of pedagogy and identify how each can be justified within contemporary Irish physical education. Students will teach individuals and small groups within their own class and then in a school context where they will work as an 'assistant teacher' within a structured context.
Numbers are limited on PY4031. The module is subject to availability on arrival at the University of Limerick.

PY4041   Applied Studies in Health Related Activity/Aquatics Δ

                                          PESS
2-1-1
Health Related Activity: Structure, phases and components of cardio-vascular endurance and resistance training classes/sessions. Safe selection, structuring and teaching of appropriate exercises. Adaptations and progressions and training principles. Aquatics: Effects of being in water on balance, propulsion and resistance; observation of differences in buoyancy; entering water safely in a variety of ways; analysis of concepts outlined above and understanding of efficient movement related to stroke technique.
Numbers are limited on PY4041. The module is subject to availability on arrival at the University of Limerick.

PY4043   Applied Studies in Athletics/Aquatics△PESS   2-1-1

Introduction to athletics via specific events and 'athletics related activities', both derive from the learning of fundamental motor skills (namely running, jumping & throwing) and all are taught with an emphasis on safety. The aquatics element concentrates on stroke work, lifesaving skills and other water-related activities. There is an equal emphasis on the student as learner and student as teacher, teaching points & ideas will be stressed throughout the course.
Numbers are limited on PY4043. The module is subject to availability on arrival at the University of Limerick.

PY4045   Applied Studies in Dance/Games △

PESS

Games: Skills and rules/concepts of games will be addressed from the perspective of developmental physical education. The skills, initially fundamental and then sport specific related to net and fielding games will be examined. Attention will be given to the developmental of tactics and individual/team plays in a game context.
Dance: Content will include the theoretical context of dance, planning dance material, stimuli, observation and the process of making, rehearsing and performing a dance.
Numbers are limited on PY4045. The module is subject to availability on arrival at the University of Limerick.

PY4053   Philosophy and Aesthetics in Physical Education△

PESS

This module in philosophy aims to introduce students to a mode of inquiry that will allow them to analyse and reflect on human movement in Physical Education and in the Arts. The branch of philosophy called Aesthetic will be of particular relevance in this inquiry.
Numbers are limited on PY4053. The module is subject to availability on arrival at the University of Limerick.

PY4054 Applied Studies in Outdoor Adventure Education△
PESS

This module will allow you to design and deliver a themes based approach to outdoor and adventure education in Ireland. Adventure themes will include building trust, communicating, team challenge and problem solving, and low level initiatives. Additional concepts to be developed include a full value contract, challenge with choice, and processing of the adventure The outdoor focus will be camp craft, basic skills of orienteering, hill walking, dragon boat paddling, basics of kayaking, prevention, causes and treatment of hypothermia in the outdoor environment, care of the environment, selecting an Adventure centre and developing its use as a compliment to your physical education programme.

Numbers are limited on PY4054. The module is subject to availability on arrival at the University of Limerick.

PY4055   Sociological Concepts of Teaching and Learning in Physical Education△

PESS

The module will introduce socialisation into and through physical education and sport. Theoretical paradigms in the sociology of sport will be examined. Social development through physical education will also be examined and inequality issues arising within school physical education. Content related to the body, culture and physical activity, the games ethic, media and commercialisation will be examined in relation to how such issues have affected, and are currently affecting, the teaching of school physical education and games.
Numbers are limited on PY4055. The module is subject to availability on arrival at the University of Limerick.

PY4063 Applied Studies in Dance / Gym△

PESS

An understanding of how tasks for teaching are compiled and developed in both movement forms will be pursued. Students will be given opportunities to select and develop appropriate movement stimuli for use in teaching, applying principles of composition to the themes of unison/canon, assisted balance, rhythmic patterns, counter tension and assisted flight. Also in gymnastics students will develop themes including locomotion, transference of weight, flight, body shape, levels and directions and partner work.
Numbers are limited on PY4063. The module is subject to availability on arrival at the University of Limerick.

PY4065   Integrated and Inclusive Physical Education △

PESS

Introduction to Integration and Adapted Physical Activity (APA). Terminology, definition, history aims and objectives of the APA movement. Legislation and disability. Categories of disability. Overview of Aetiology and incidence of disabilities. Integration and inclusion in schools and the community. Adapted physical activity programming, principles, content and implementation. Integration problems. Public facilities adaptations for disabled individuals. Sport and disability. Adapted Physical Activity infrastructure in Ireland.
Growth, Posture and Development: The growth and physical development of the normal child. Injury and injury rehabilitation: Role of exercise in rehabilitation. Aetiology of injury, common types of injury. Immediate first aid. Care and prevention of injury.
***Numbers are limited on PY4065. The module is subject t*PY4201 Psychology/Sociology (Autumn/1)**

3 hours per week; 13 weeks/1st semester; 26L/13T; ECTS credits:6

Sport in the socio-historical process and the role of sport in modern society; psychology and motor skills; classifying motor skills; information processing; stages of learning; structure and function of the neurones closed loop systems of control; motor programmes, roles and vision and proprioception; attention; memory differences, personality, body image, self image; motivation; stress and competition.

PY4205   Psychology / Sociology (Autumn/3)

3 hours per week; 13 weeks/5th semester; 26L/13T; ECTS credits:6

Physical education and social and cultural values; perspectives of social reality; socialisation through sport; aggression and violence in sport; women in physical education and sport; racism; sport and the media; arousal

and anxiety; audience effect; communication; learning and performance of media skills; influences of growth or maturation; structuring and practice; feedback; effects of fatigue; theories of motor learning.

PY4301 Practical/Gym/Dance/ Aquatics 1 (Autumn/1)

4 hours per week; 13 weeks/1st semester; 52LAB;ECTS credits:6

Development of personal movement ability in terms of : body, effort, space and relationship with efficiency; gymnastics and aquatics and the body as an instrument of expression stressed in dance.

PY4303 Practical/Gym/Dance/ Aquatics 2 (Autumn/2)

4 hours per week; 13 weeks/3rd semester; 52LAB; ECTS credits:6

Expansion of students' ability to work with other people and to assess how best personal resources can be harnessed to answer a task; aquatics; and the development of competencies required to ensure safety in and around water.

PY4503 Games 2 (Autumn/2)

3 hours per week; 13 weeks/3rd semester; 39LAB;ECTS credits:6

Common principles of invasion games; structures, rules, principles, skills and basic tactics of netball, rugby and camogie/hurling; principles of net games; structure, rules, principle, skill and basic tactics of tennis; introducing activities and progressions; safety aspects.
Prerequisite PY4502

PY4505 Games * (Autumn/3)

5 hours per week; 13 weeks/5th semester; 65LAB;ECTS credits:6

Structures, rules principles, skills and basic tactics of baseball, cricket and rounders, introducing activities and progressions. Two invasion games and one net game selected from Games 1 and Games 2 modules.
Prerequisite PY4503

PY4803 Pedagogical Aspects of Physical Education (Autumn/2)

3 hours per week; 13 weeks/3rd semester; 26L/13T; ECTS credits:6

Examination of the factors influencing the development of physical education during selected historical periods; examination of curriculum models as they relate to physical education; evaluation of existing PE. syllabus and the principles associated with planning schemes and lessons in PE; students will also be involved in the implementation of a range of teaching strategies and management skills; together with reflective reviews of decision making, in the context of educational theories.

SS4103 Psychology 2: The Child and Adolescent in Sport Participation   (Autumn/2)

8 hours per week; 13 weeks/3rd semester; 26L/78LAB; ECTS credits:6

Motor skills development as a part of human development (a) as a process (b) as a field of study, descriptions of the

phases of motor development from infancy to adolescence (reflexive rudimentary, fundamental skills, sport specific skills), noting the changing characteristics, direction of development, genetic V environmental (nature V nurture) debate, historical overview of methods of investigation; influences of the individual (biology/genetic), the environment and task demands; dynamic systems perspectives; readiness to learn, critical/sensitive periods; perception and perceptual development; (vision and kinesthesis); balanceand its development; evaluation and perceptual motor training programs. Conceptual approaches to the Study of Motor Development; introduction to sociology of sport; socialisation into sport; significant others; stages of play; gender differences; psycho social models of development; children in sport and exercise; coach and media influences; talent identification; burnout dropout and child abuse in sport. Adolescent motivation and participation in exercise and sport; personality, body image, self image and self concept; group dynamics and leadership; at risk groups; gender issues and sport; eating disorders, substance abuse; disability and sport; bridging the participation gap.

SS4105 Psychology 4 Analysis of Motor Skill Performance (Autumn/3)

8 hours per week; 13 weeks/5th semester; 26L/78LAB; ECTS credits:6

Psychology and learning; psychology and motor skills; the scientific method and motor skills; development of motor skill theory; defining and classifying motor skills; stages of learning; information processing in skill; structure and function of the neuromuscular system; roles of vision and propropception; attention; memory; individual differences; implications for teaching/coaching and performance; consideration of the ecological approach to motor skills; practice and learning; structuring practice, demonstration, feedback, transfer, guidance, effects of fatigue, theories of motor learning.

SS4202 Physiology 1: Introduction to Human Physiology (Autumn/1)

4 hours per week; 13 weeks/1st semester; 26L/26LAB; ECTS credits:6

The power-endurance continuum of sport and exercise. The physiological requirements of selected sports. An introduction to systems physiology concentrating on structure and function. An introduction to homeostasis and homeostatic control.

SS4203 Physiology 1: Introduction (Autumn/2)

4 hours per week; 13 weeks/3rd semester; 26L/26LAB; ECTS credits:6

Organisation of the human body into systems, organs, and tissues; introduction to the following systems in exercise and sport: nervous, cardiovascular, respiratory, endocrine, uro-genital and digestive systems; the musculo skeletal system with respect to movement and exercise.
Prerequisite BC4902

SS4205 Physiology 4: Physiological Monitoring (Autumn/3)

4 hours per week; 13 weeks/5th semester; 26L/26LAB; ECTS credits:6

A critical examination of methods of evaluation of and monitoring the various aspects of physical fitness including cardio-respiratory fitness, local muscle endurance, muscle strength, muscle speed, joint flexibility

and body composition; research methods including note-taking, record-keeping and referencing; writing and regular reporting to supervisor; adherence to academic standards of accuracy and honesty. *Prerequisite BC4204*

SS4207   Physiology 5: Nutrition, Fluid and Electrolyte Balance (Autumn/4)

4 hours per week; 13 weeks/7th semester; 26L/26LAB; ECTS credits:6

Food as a source of energy and essential nutrients; metabolism of food; energy balance; diet and health; obesity and eating disorders; measurement of nutritional status; intake of nutrients, water and electrolytes before, during and after exercise; fluid balance; carbohydrate loading and other sports nutritional techniques; ergogenic aids; drugs in Sport including 'blood doping'.

SS4302   Biomechanics 1: Kinesiology of Movement (Autumn/1)

4 hours per week; 13 weeks/2nd semester; 26L/26LAB; ECTS credits:6

Anatomical terms and definitions; identification and function of musculo-skeletal systems; joint articulations, motions and range of movement; origin, insertion and action of main skeletal muscles; kinesiology of head and neck, shoulder girdle, arm, trunk, pelvic girdle and leg; basic neuronantomy; kinesiological analysis of simple movements including posture; injury prevention analysis and programmes.

SS4305   Biomechanics 4*   (Autumn/3)

4 hours per week; 13 weeks/5th semester; 26L/26LAB; ECTS credits:6

Calculation of loads acting on participant in sport and exercise; net joint movements and forces; bioengineering models; measurement or estimation of muscle forces including the use of EMG; estimation of loads in bones and soft tissues; mechanical properties and behaviour of biological tissues; injury causes and prevention; aspects of techniques in sport and exercise; surfaces; shoes; other protective equipment; effects of equipment on movement patterns and their optimisation; other equipment; evaluation of rehabilitation procedures. *Prerequisite SS4303*

SS4308   Biomechanics 5 (3d analysis of sports activities)   (Autumn/4)

4 hours per week; 13 weeks/8th semester; 26L/216LAB; ECTS credits:6

To develop skills in 3D analysis of motion and apply 3D analysis techniques to selected sports activities. To examine the effects of advanced methods of data smoothing. Advanced examination of gait: subtalar joint motion and motion of knee and hip joints in the transverse plane. To examine the effects of orthoses on the kinematics and kinetics of human movement. *Prerequisite SS4305*

SS4401   Sports & Exercise Applications 1   (Autumn/1)

5 hours per week; 13 weeks/1st semester; 65LAB;ECTS credits:6

Sport: Student will choose from athletics, basketball, volleyball, netball. Pedagogy: microteaching; criteria for effective teaching; verbal communication; planning and presentation skills; questioning skills; appraisal. Physical

conditioning: principles of training; warm-up and cool-down procedures; endurance training.

SS4403   Sports & Exercise Applications 3* (Autumn/2)

5 hours per week; 13 weeks/3rd semester; 65LAB;ECTS credits:6

Sports from outdoor pursuits, Gaelic football, hurling, hockey, soccer and rugby; organisation of events and competitions; record keeping, first aid; structuring of content and planning of schemes; teaching/coaching experience; introduction to exercise to music, structure and phases of exercise to music class, purpose of each phase, choice of music, steps, adaptations and progressions.

SS4405   Sport & Exercise Applications 5 * (Autumn/3)

6 hours per week; 13 weeks/5th semester; 78LAB;ECTS credits:6

Classification of injury; incidence and causes of injury by sport; first handling of injury; procedures for referral to medical/ other agencies; aquafitness; weight training; theory of treatment of the 'acute' phase of the injury; management of the injured athlete while undergoing treatment; i.e. maintenance of CV fitness (use of pool); pathophysiology of soft tissue injury and repair *.i.e.* inflammation degeneration regeneration; Functional adaptations of musculo-skeletal system to accommodate the injury. Physiological/Biomechanical/ Motor/ Psychological issues of the injured athlete.
Prerequisite SS4303

SS4407   Sport and Exercise Applications 6* (Autumn/4)

6 hours per week; 13 weeks/7th semester; 78LAB;ECTS credits:6

The Emphasis in these modules is placed on applying scientific methods to sport and exercise through a series of selected mini-projects carried out in groups. The projects themselves determine the syllabus content and the emphasis is placed on students developing important practical skill in sport and exercise science. The projects will involve the students in for example: testing the theory of projectiles in track and field athletics; investigate the physiological rationale for warm up and cool down; evaluation of the merits of field and laboratory based tests of performance; test the theory of the benefits of stretching and flexibility to increase performance; investigate the relationship between anxiety and performance in sport and / or exercise; assess methods of intervention for overcoming problems related to anxiety, motivation or concentration; examine the physiological , psychological and biomechanical demands of a selected sport for exercise activity; Muscular strength and power development for sport; resistance training for specific populations. e.g. children, elderly.

Faculty of Education and Health Sciences - Spring

EN4002 Introduction to Principles & Practice of Primary Education* (Spring/1)

5 hours per week; 13 weeks/2nd semester; 13L/26T/26LAB;ECTS credits:6

To introduce students to a variety of theoretical perspectives and pedagogical practices associated with a pupil-centred approach to education; to acquaint students with a cognitive, socio-emotional, and moral bases of human development; to enable participants to select or design and produce the learning media which are most appropriate in a variety of pedagogical settings. Prerequisite EN4001

EN4004 Introduction to Reflective Practice (Spring/2)

5 hours per week; 13 weeks/4th semester; 26L/39T; ECTS credits:6

Planning a scheme of work: context, aims, subject matter, organisation of learning experiences, evaluation; devising lesson plans, becoming self-critical; teaching practice: evaluating teaching practice: analysing problems encountered; teaching practice as a learning experience for the student teacher.

EN4006 Curriculum Studies* (Spring/3)

4 hours per week; 13 weeks/6th semester; 26L/26T; ECTS credits:6

Definition of curriculum; core curriculum; national curriculum structures; international comparisons; hidden curriculum; curriculum planning at school level; de-schooling; curriculum innovation; curriculum evaluation; conceptions of reflective school; school review; action research; teaching mixed ability; modes of assessment; teacher self appraisal. Prerequisite EN4004

EN4008 Teachers as Professional* (Spring/4)

3 hours per week; 13 weeks/8th semester; 26L/13T; ECTS credits:6

Equity in schooling; gender; social class; special needs; education of minorities; values in education; the European dimension in education; school based assessment; the school as a social agency; substance abuse; sex-education; bullying and harassment; AIDS education; assessment. *Prerequisite EN4007*

EN4014 Technology and Society (Spring/2)

4 hours per week; 13 weeks/4th semester; 13L/26T/13Lab; ECTS credits:6

Technology and culture in developing and in technologically advanced cultures; technology for sustainable economic growth and development; appropriate technology and technology transfer to developing countries; ethics and technology; biotechnology, reproductive technology; educational technology; communication technology and international relations; technology and the environment: acid deposition, greenhouse warming, forest decline, ozone depletion. An examination of the dominant issues confronting the classroom teacher today; the role and professional status of the teacher in contemporary society; the psychology of motivation; school effectiveness; educational evaluation and assessment; psychometric,

dialectical and information processing models; intelligence and creativity.

PY4306 Practical/Gymnastics/ Dance/Aquatics 3 (Spring/3)

5 hours per week; 13 weeks/6th semester; 65LAB; ECTS credits:6

Stylised compositional forms in gymnastics and dance; aquatics and personal performance; by developing confidence in a range of activities including swimming, diving, waterpolo and aquatics. Focus on teaching in curriculum context

PY4402 Philosophy/ Aesthetics   (Spring/1)

3 hours per week; 13 weeks/2nd semester; 13L/26LAB; ECTS credits:6

The contribution of philosophy to physical education; physical education and the nature of knowledge; the influence of philosophical theories; aesthetic concepts in physical education; aesthetic and artistic activities; to experience and appraise in creative contexts.

PY4408 Philosophy /Aesthetics*   (Spring/4)

4 hour per week; 13 weeks/8th semester; 26L/26T; ECTS credits:6

Criteria for selection of content in physical education; propositional and procedural knowledge; causal and intentional explanations for human movement; distinction between intelligent action and intellectual engagement; curriculum justification theories and physical education; objectivity and aesthetics; distinction between artistic and aesthetic concepts; reason and feeling in the arts; skill - as a necessary condition; aesthetic and artistic activities in order to experience and appraise in creative contexts. *Prerequisite PY4402*

PY4502 Games 1 (Spring/1)

6 hours per week; 13 weeks/2nd semester; 13L/65LAB; ECTS credits:6

Common principles on invasion games; structures, rules, principles, skills and basic tactics of hockey, basketball, Gaelic football, soccer; common principles of net games, structures, rules, principles, skills and basic tactics of volleyball and badminton; introducing activities and progression; safety aspects

PY4602 Outdoor Pursuits/Athletics   (Spring/1)

3 hours per week; 13 weeks/2nd semester; 39LAB;ECTS credits:6

Introduction to the outdoor pursuit activities of canoeing, orienteering, rock climbing, wind surfing, board surfing, hill walking, navigation and camp craft with an emphasis on safe participation; athletics; basic and working techniques for 12 events form the categories of running, throwing and jumping covering introducing activities, progressions, identification and correction of faults, basic rules, safety aspects and organisation of large groups.

PY4608 Outdoor Pursuits/Athletics*   (Spring/4)

6 hours per week; 13 weeks/8th semester; 78LAB; ECTS credits:6

Safety procedures, prevention, causes and treatment of hypothermia in the activities of canoeing and orienteering; developing confidence, improving self recovery strokes,

rescue work and boat control; introduction of coloured maps to develop map reading skills and work on route choices and attack points; safety aspects, mechanical principles, key factors of technique, progressions for teaching and identification and correction of faults for selected track and field events. *Prerequisite PY4602*

PY4704 Health Education/Recreation Studies (Spring/2)

3 hours per week; 13 weeks/4th semester; 26L/13T; ECTS credits:6

Risk factors affecting health, essential health skills, stress and stress management, eating disorders, body image and self esteem; health education in the school setting; pastoral care and life skills approaches; the changing family; substance use/abuse; counselling and listening skills; relationship education; child abuse; leisure, play, games, time, work, current leisure practices, leisure and the life cycle.

PY4806 Pedagogy/ Curriculum*   (Spring/3)

3 hours per week; 13 weeks/6th semester; 26L/13T; ECTS credits:6

Principles of design\curriculem models\action-research projects. Principles associated with the structured observation of teaching and learning. Video analysis of subject matter, methods of presentation and learning in specific teaching contexts. *Prerequisite PY4803*

PY4908 Special Needs/Administration Studies (Spring/4)

3 hours per week; 13 weeks/8th semester; 26L/13T; ECTS credits:6

Background information and theory of a range of handicaps in young children; knowledge in working with children with ranges of handicap; theory of administration of physical education.

SS4102 Psychology 1: Socio-Psychology Foundations Sport & Exercise   (Spring/1)

4 hours per week; 13 weeks/2nd semester; 26L/26LAB; ECTS credits:6

Psychology as a discipline and mode of enquiry; major branches of psychology; evolution of sport and exercise psychology; sociological aspects, sport in Ireland - structures and processes, groups in sport, participation levels; introduction to key concepts in the psychology of sport - attention, personality, motivation, stress; the individual performer; key mental skills; rationale and pathway for the socio-psychological study of the course, the life cycle approach.

SS4104 Psychology 3: The Psychology Year Thru to Old Age   (Spring/2)

4 hours per week; 13 weeks/4th semester; 26L/26LAB; ECTS credits:6

Cognitive and information processing aspects of movement in adulthood, attention and attentional styles; personality and performance including profiles at different skill levels; body image, self image and self concept; motivation including major behaviour determinants in participation and performance; stress, anxiety and arousal; social facilitation; aggression and violence; exercise and psychological well-being; effects of ageing; retirement

and detraining; gender difference factors; application of skills for mental control.

SS4107 Psychology 5: Psychology of Coaching and Performance   (Spring/4)

4 hours per week; 13 weeks/7th semester; 26L/26LAB; ECTS credits:6

Evaluation and application of psychological theory to coaching methodology; developing a philosophy of coaching; coaching styles; leadership; communication; coaching youth sport; assessment of pre-competition and competition behaviours; evaluation of techniques and skills for mental control; initiation and development of mental skills programmes; group dynamics, team preparation, psychological aspects of injury

SS4202 Physiology 1 Introduction to Human Physiology   (Spring/1)

4 hours per week; 13 weeks/2nd semester; 26L/26LAB; ECTS credits:6

Organisation of the human body into systems, organs, and tissues; introduction to the following systems with special reference to exercise and sport; nervous, cardiovascular, respiratory, endocrine, uro-genetial and digestive systems; special attention to musculo-skeletal system with respect to movement and exercise; the genetic basis of growth; normal growth patterns including influencing factors; anatomical and physiological sex differences with influence exercise and sports performance.

SS4204 Physiology 2: The Physiology of Exercise * (Spring/2)

4 hours per week; 13 weeks/4th semester; 26L/26LAB; ECTS credits:6

Physiological changes during acute and chronic exercise, especially involving cardiovascular, respiratory and muscular systems and thermoregualtion in children, adults and the elderly; limiting factors to performance including fatigue; influence of altitude on training and performances; respiration underwater using SCUBA apparatus; use and abuse of argument, evidence, reason proof, analysis and interpretation; academic standards of accuracy and record. *Prerequisite SS4203*

SS4206 Physiology and Kinesiology in Biomedicine (Spring/3)

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; muscle fibres; organisation into motor units; circulatory system; structure and function of the heart; blood vessel structure and function; the respiratory system; structure and function of the upper respiratory tract; The kidneys and renal function; Identification an functions of the musculo-sketal system; introduction to injury prevention and analysis

SS4208 Physiology 5:Physical Activity, Health and Common Diseases   (Spring/4)

4 hours per week; 13 weeks/8th semester; 26L/26LAB; ECTS credits:6

Types, causes and incidence on relevant diseases including morbidity and mortality statistics of adults and children; heart disease obesity, diabetes, respiratory conditions, musculo-skeletal problems, cancer, and other

common dorms of disease; the place of exercise in health related fitness; exercise and pregnancy; exercise and the immune system; interaction with other professionals working in the health field; sports injuries their pathogenesis treatment principles and possible prevention.

SS4304 Biomechanics 2 Introductory and Applied Sports Biomechanics* (Spring/2)

4 hours per week; 13 weeks/4th semester; 26L/26LAB; ECTS credits:6

Application to movement of axes and planes of movement and muscle forces; fluid statics and hydromatics; air flow effect; water flow effect; locomotion including walking and running; sports skills; basic biomechanical analysis; visual and instrumental methods of analysis; point, rigid body, quasi-rigid body and linked segment models; gait analysis; optimal movement patterns; mathematical modelling. *Prerequisite SS4302*

SS4402 Sports & Exercise Applications 2   (Spring/1)

5 hours per week; 13 weeks/2nd semester; 65LAB; ECTS credits:6

Exercise: Phases & components of exercise to music, weight training and circuit training classes. Content & purpose of each phase. Safe exercise selection for cardiovascular endurance, muscular endurance, muscular strength & flexibility. Adaptations & progressions. Application of training principles. Safety guidelines. Pedagogy: Role of the teacher in exercise classes. Safety & screening procedures. Instruction experience in exercise to music, weights & circuits. Observation, analysis, correction & feedback. Class management & class plans for each of the different types of exercise classes. Use of music. Monitoring of clients. Exercise prescription. Self evaluation. First Aid: Principles of first aid and action at an emergency. Assessment of the situation. Examining a casualty. Respiratory system, asphyxia, CPR for adult/child/baby theory & practical, recovery position. Circulatory system, wounds, bleeding, shock, dressings & bandages. Disorders of consciousness. Soft tissue & bone injuries. Treatment of burns, scalds, chemicals/poisons & electric shock. Medical emergencies. Crush & spinal injuries. Causality transportation

SS4404 Sports & Exercise Applications 4   (Spring/2)

5 hours per week; 13 weeks/4th semester; 65LAB; ECTS credits:6

Theories of Organisations, identifying the administrative structure and function of Irish N.G.B's through case studies (GAA, IRFU, FAI, etc.) Operating within an organisation, minutes, meetings and time management. N.C.T.C. induction course: historical perspective, player/athlete support, national coaching development programme. Organising of a major sports event: planning budgeting, promoting, sponsorship, safety and legal aspects, running the event, media, evaluation. Legal and ethical responsibilities. Work experience in relevant areas of Sports administration on campus. Planning, delivery and evaluation of phases of a single session, and of a number of sessions. Coaching experience gained by placement of students to work with coaches or exercise leaders in an ongoing practical setting. Maintenance of a coaching log.

SS4408 Sports & Exercise Applications 7* (Spring/4)

6 hours per week; 13 weeks/8th semester; 78LAB; ECTS credits:6

The emphasis in these modules is placed on applying scientific methods to sport and exercise through a series of selected mini-projects carried out in groups. The projects themselves determine the syllabus content and the emphasis is placed on students developing important practical skills in sport and exercise science. The projects will involve the students in for example: testing the theory of projectiles in track and field athletics; investigate the physiological rationale for warm up and cool down; evaluation of the merits of stretching and flexibility to increase performance; test the theory of the relationship between anxiety and performance in sport and/or exercise; assess methods of intervention for overcoming problems related to anxiety, motivation or concentration; examine the physiological, psychological and biomechanical demands of a selected sport or exercise activity.

FACULTY OF SCIENCE AND ENGINEERING

Dean, Professor Kieran Hodnett

Mission

The mission of the College of Engineering is to produce engineering scholarship of the highest quality and to make this scholarship available to as wide an audience as possible.
The College sees its mission as providing high-quality, cost-effective education and relevant research of the highest international standing for the electronics, software, telecommunications and related industries in Ireland and worldwide.

Department/Faculty Information

The Faculty of Science and Engineering comprises of the following Departments: Department of Manufacturing and Operations Engineering, Department of Materials Science and Technology, Department of Mechanical and Aeronautical Engineering and School of Architecture..
Department of Computer Science and Information Systems, Department of Electronic and Computer Engineering, Department of Mathematics and Statistics. These Departments bring together the inter-related disciplines of mathematics, software, computing, communications and electronics in an innovative and forward looking structure, which offers exciting opportunities for developments in these strategic areas.
Department of Life Sciences, Department of Chemical and Environmental Sciences and Department of Physics.

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Life Sciences: Department of Life Sciences

Chemical and Environmental   Dr Bernadette O'Regan
Sciences: Department of Chemical & Environmental Sciences
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                                email: bernadette.oregan@ul.ie

Undergraduate Degree Programmes Offered

Bachelor of Science in Biomedical and Advanced Materials
Bachelor of Technology in Wood Science and Technology
Bachelor of Engineering in Biomedical Engineering
Bachelor of Design in Industrial Design (interdisciplinary with the National College of Art and Design, Dublin)
Bachelor of Engineering in Mechanical Engineering
Bachelor of Engineering in Computer Integrated Design
Bachelor of Science in Product Design and Technology
Bachelor of Engineering in Aeronautical Engineering
Bachelor of Engineering in Mechanical Engineering (with German)
Bachelor of Engineering in Manufacturing Engineering
Bachelor of Technology in Manufacturing Technology
Bachelor of Science in Computer Systems
Bachelor of Science in Mathematical Sciences and Computing
Bachelor of Engineering in Computer Engineering
Bachelor of Engineering in Electronic Engineering
Bachelor of Technology in Electronic Systems
Bachelor of Technology in Information Technology and Telecommunications
Bachelor of Science in Industrial Chemistry
Bachelor of Science in Industrial Biochemistry
Bachelor of Science in Applied Physics
Bachelor of Science in Environmental Science
Bachelor of Science in Food Technology
Bachelor of Science in Equine Science

Faculty of Science and Engineering (Autumn)

Computer Science Modules

CE4205 Microcomputer Systems (Autumn/3)

4 hours per week; 13 weeks/5th semester; 26L/26LAB; ECTS credits:6

Overview of the 8086 architecture including, memory and I/O mapping, memorsegmentation, interrupt structure, the components of the standard PC base on the 8086 processor; the programmers model for the 8086, instruction se, addressing modes, 8086 assembly language programming tools; operating system introduction; definitions, components command shells, services overview; MS-DOS memory organisation, extended and expanded memory; interrupt handers, BIOS and DOS functions; device drivers; concept, designing applications; disk storage organisation; disk structures, file and directory structures, performance considerations; introduction to micro-soft windows 3.1; implementation as an extension of DOS, memory organisation, simple co-operative multi-tasking features.

CE4517   Digital Systems 6 (Autumn/4)

5 hours per week; 13 weeks/7th semester; 26L/13T/26LAB; ECTS credits:6

Designing with DRAMS in microprocessor-based systems. Graphics and image displays using DRAM, VRAM. DMA hardware; error detection and correction hardware; CRC approach to error detection; Disk storage - media consideration, data coding and system aspects. Xilinx programmable logic.

CE4607 Computer Networks (Autumn/4)

3 hours per week; 13 weeks/7th semester; 26L/13T; ECTS credits:6

The course incorporates: communications within and between computer systems, switching and routing protocols, distributed network architecture's incorporating application oriented protocols and standards.

CE4701 Computer Software 1 (Autumn/1)

4 hours per week; 13 weeks/1st semester; 26L/26LAB; ECTS credits:6

Outline structure of a digital computer; the role and use of the operating system; computer applications software; language hierarchy; Algorithms and problems solving; structuring complex problems, the subprogram concept; Arrays; Input and Output; Disk files.

CE4703 Computer Software 3* (Autumn/2)

4 hours per week; 13 weeks/3rd semester; 26L/26LAB; ECTS credits:6

Advanced C language programming;. structures; dynamic memory management; separate compilation; modules; header files; linkage; variables, access and scope; data abstraction in C; error handling; recursion; algorithm performance analysis; order notation; sorting arrays of objects; sorted array searching; data structures and abstract data types (ADTs); hashing; data design and selection of data structures.

CE4707 Software Engineering (Autumn/4)

4 hours per week; 13 weeks/7th semester; 26L/26T; ECTS credits:6

Object oriented analysis/design; object oriented programming; Smalltalk programming language; C++ programming language; C++ development environments; case study and project. *Prerequisite: CE4706*

CE4717 Language Processors* (Autumn/4)

5 hours per week; 13 weeks/7th semester; 26L/13T/26LAB; ECTS credits:6

An introduction to the theory of compiler design and its application in a simple compiler; the implementation of a compiler for a simple, Pascal-like language; compiler structure; grammars; parsing; syntactic error detection and recovery; semantic processing; code generation for a simple stack machine; scanning; table-driven parsing techniques; code generation for register architectures; introduction to code optimisation techniques. *Prerequisite CE4703*

CE4817 Digital Signal processing 1 (Autumn/4)

4 hours per week; 13 weeks/7th semester; 26L/26T; ECTS credits:6

Discrete Time Systems; digital filters; digital filter design: FIR design by the window method; IIR design based on continuous-time systems; 2-D processes: the discrete Fourier transform.

CE4907/4908
Computer Engineering Project 1/2
The final year project is undertaken throughout the two semesters of the final year and The project is intended to give a student the chance to study a topic in depth and to apply his/her theoretical knowledge to a practical situation. Whilst working on the project he/she learns to direct their own work, be critical of their own methods and also learns to conduct detailed measurements and write a report presenting their results and reasoning. Students are expected to work on their project independently and must be available for consultation with their supervisor.

This module is only available for ERASMUS students that stay for the full academic year (2 semester) in the Department of Electronic and Computer Engineering (ECE). Students doing project work are required to find a supervisor themselves. It is advisable for students to investigate research areas of ECE at www.ece.ul.ie and to contact staff members regarding the availability of research projects before arriving in Limerick. However, it is quite usual that projects are agreed upon after the student has arrived.

It is anticipated that students will take up to 4 additional (taught) modules. This module gains 10 ECTS credits per semester (20 for the full year).

For further details please contact Dr Reiner Dojen (reiner.dojen@ul.ie).

CS4003 Information Society 1: Social Theories of New Media (CSI 2-1-0)

The aim of the module is to gain an understanding of the social and cultural implications of new media. The impact new media have had on information sharing, processing and consumption and the changes on cultural attitudes and practices new media provoked. The course should also introduce students to the body of literature regarding social theory and new media and to the current research studying the impact of new communication technologies into our everyday lives. Brief syllabus: cultural and social implications of new media and emerging technologies; analysis of social theories of media and research on new media in society; focus on the features of new emerging media (e.g. internet agents, distributed systems, intelligent environments) and the probable future social impact of these new communication technologies on culture.

CS4007 Information Society 2 (CSI 2-1-0)

This course offers a socio-economic, political and cultural exploration of the "internet society". The course will provide a series of perspectives on the network society, examining its conceptual foundations, critiquing its more polemical exponents, and subjecting the claims of the electronic sublime to critical scrutiny. The course will help students understand some of the current debates in the media about the effects of information and communications technology on society. Brief syllabus: the course will examine the claims of those who argue for the emergence of a radically new Information Society, as against those who see the emerging society as being fundamentally a continuation of existing socio-economic forces; the differing perspectives of technological determinism and social determinism will be examined; the notion of "information ecologies" will be examined, as well as the current debate about the "knowledge society".

CS4013 Object Oriented Development (CSI 2-2-2)

On successful completion of this module students will be able to identify, design, formulate and assemble classes using inheritance hierarchies, encapsulation and polymorphism to solve specified programming problems. Brief syllabus: introduction to object orientation terminology; procedural approach versus object oriented approach to problem solving; discovering classes; class-responsibilities-collaborations (CRC) cards; CRC session; CRC cards for analysis; representing classes, objects and attributes; analysis-level diagram; defining classes, objects, methods, access modifiers, invocation; pre-defined object values; constructor method; overloading and overriding methods; exception handling; garbage collection; extending classes; nested classes and interfaces; interfaces and polymorphism; single inheritance of implementation; collections; streams and buffers; declaring packages;

CS4023 Operating Systems (CSI 2-1-1)

On successful completion of this module a student should have a clear understanding of the (i) logical structure of, and facilities provided by, a modern OS (ii) concepts of processes, threads and multithreading and how they are implemented in a modern OS (iii) problems that arise when processes collaborate and compete and well as being able to demonstrate practical experience of mechanisms for handling these situations (iv) different ways of implementing virtual memory (v) use of system calls. Brief syllabus: the need for the OS; different types of OSs; interfaces to an OS; processes and threads; process scheduling; multithreading; context switching; concurrency, including interaction between threads; inter process communication (IPC); synchronization and mutual exclusion problems; software algorithms for IPC; 2 processes, n processes; low and high level mechanisms for IPC and synchronization: signals; spinlocks; semaphores; message passing and monitors; deadlock; use of semaphores for synchronization, mutual exclusion, resource allocation; implementation of semaphores; use of eventcounts and sequencers for classical IPC problems; conditional critical regions; monitors and condition variables; physical and virtual memory; segmentation and paging; cache memory; system services for memory management; I/O subsystem; locking; buffering; file systems and file management; file system based IPC; pipes; the socket mechanism; IPC using sockets; fault tolerance and security;

CS4027 Information Retrieval & Knowledge Representation (CSI 2-1-1)

To introduce students to the fields of information retrieval and knowledge representation as they pertain to information systems. Brief syllabus: the document collection; character encoding standards; automatic text processing; retrieval systems; retrieval based on sounds and images; measures of performance; modelling, classification and clustering; knowledge representation and visualisation; ontologies; content management systems; web-based knowledge representation; semantic web technologies; the business case for the semantic web.

CS4031 Introduction to Digital Media (CSI 2-0-0)

On successful completion of this module students will: have considered the influence of technology on human cognition and activity; considered a number of case studies focussed on particular technologies and media. Brief syllabus: The influence of technology on cognition and activity, the relationship of technology to practice, form, content and remediation, case studies will consider the influences, consequences and interrelationship of: the written word, printing press, computer & digitisation, world wide web, music instrument form, mnemonics, notation, recording, digitisation, the reproduced image, printing press, camera, film, television, digitisation, narrative, orality, ritual & theatre/opera, illusion, interactive systems, sensors, virtual spaces, remediation.

CS4033 Information-Flows in Business (CSI 2-1-0)

To provide students with an overview of business organisation and operation. To provide students with an awareness of the information flows within and between business firms. To provide students with an appreciation of how information systems can support business objectives. Brief syllabus: Key functional areas of business; flows of information in an organisation; detailed examination of typical information flows in order processing, inventory, customer service, marketing and sales, payroll and personnel; accountability for the assets/liabilities of the business; financial reporting aspects of business operations; auditing requirements; legal obligations; summary budgets; classification of information systems; how an information system can support business objectives;

CS4035 Computer Graphics tools and technique (CSI 2-1-2)
To provide the students with expertise to develop a competence in the programming of interactive two and three dimensional graphics using a number of tools and techniques. This module involves practical graphics programming and students will build on the knowledge they have gained in the earlier Computer Graphics module. Brief syllabus: topics include animation, interactions between objects, major components and features of interactive graphics systems, interactivity (game programming) 2D and 3D, principles of image formation, illumination models, shading, morphing.

CS4111 Computer Science 1 (Autumn/1) (CSI 2-1-1)

5 hours per week; 13 weeks/1st semester; 26L/13T/26LAB; ECTS credits:6

Aims: To understand the mathematical basis of many complex computations, to lay basis for derivation of simple programs from formal specifications and to understand the dependence of program on underlying evaluation mechanisms. Objective: On successful completion of this module the student should be able to: 1. Construct syntax trees for expressions (including conditional expressions), involving operations of different arities and signatures, determine the partial ordering of evaluation of subexpressions implied by tree structure, generate a semantically equivalent expression in prefix or postfix notations, evaluate the expressions by hand, and by writing fragments of code in a procedural language and a functional language, and given an expression in lambda notation, to determine the free and bound variables; 2. Construct an inductive definition of some simple functions over the Natural Numbers, derive a functional program, and derive semantically equivalent iterative and recursive programs written in a selected procedural language. Brief syllabus: programming as a form of specification of (not necessarily numerical) computations using specific evaluation mechanisms, and specific notations, analysis of mathematical notations including fixity, arity, precedence of operators, as well as grouping of operands; purely linear notations, and precedence of operators; syntax trees, and lambda notation, together with scope and partial ordering of operations; conditional expressions, and elementary recursion; inductive definition of functions, and proof by induction; derivation of functional, recursive and iterative programs from inductive definitions;

CS4135 Software Architectures(Autumn/3) (CSI 2-1-2)

4 hours per week; 13 weeks/7th semester; 26L/13T/13Lab; ECTS credits:6

To provide students with an understanding of complex software systems and to provide them with the skills to create such software. Brief syllabus: Graphical User Interfaces; Survey of the Major Object Oriented Libraries; Software Components; Component Architectures; Overview of Software Architectures; Architectural Styles; Architectural Mismatches.*Prerequisite: CS4113*

CS4146 Document Architectures (CSI 2-0-2)

To expose students to structure, design issues and to the practical tools and programming environments involved in representing and manipulating forms of information that are commonly used in computer systems. Brief syllabus: overview of the variety, content and structure of documents; representations of text documents, UNICODE, and markup, especially XML; document display and exchange; representation, perception and manipulation of non-text documents, such as images, sound and video; streaming; conversion between representations; multiple media documents; visualisation and navigation; active documents; creation of active documents in server-client architecture; authoring, scripting, programs, at server and client interface; introduction to electronic commerce.

CS4157 Software Quality (CSI 2-2-0)

To provide an understanding of the processes and techniques used to develop and maintain quality software. Brief syllabus: Software quality assurance and standards; Software Inspections; Process versus Product quality and quality characteristics; Software testing techniques and strategies; Software Maintenance; Quality metrics; Evolution of software process; Introduction to ISO15504; Configuration Management.

CS4211 Computer Organisation 1 (Autumn/1)(CSI 2-1-2)

3 hours per week; 13 weeks/1st semester; 26L/13T; ECTS credits:6

To provide the student with a sound understanding of the representation of basic data types in a computer and to introduce the student to computer hardware as it pertains to the software developer.   Brief syllabus: introduction to computer architecture; the representation of data; principles of error detection and prevention; introduction to Boolean algebra; combinatorial and sequential logic; integrated circuit fabrication; main memory; backing storage; magnetic and floppy disks; input and output peripherals; principles of data communication; microprocessors; hardware.

CS4218 Telecom Networks Architectures (Autumn/4) (CSI 2-1-0)
3 hours per week; 13 weeks/8th semester; 39L; ECTS credits:6

To set out the structure of current Telecommunication networks in terms of transmission, switching, and signalling elements. To highlight the forces which are causing rapid evolution in the field of telecommunications, fixed and mobile, and to present a cross section of the most important technologies, which are associated with telecommunications today. After completion of this module students should have a good understanding of transmission and switching technologies as used in modern networks today, including the role of the Internet Protocol.

This module is the first of a 2-module stream. The second module, CS4228, discusses signalling, mobility and intelligent networking principles*. Prerequisite: CS4525*

CS4411 Imperative Programming   (Autumn/1) (CSI 2-1-4)
5 hours per week; 13 weeks/1st semester; 39L/26T; ECTS credits:6

Aim: To provide a language-independent introduction to imperative programming using one programming language. Objective: On successful completion of this module the student should be able to design and program solutions, to solve simple practical problems using primitive data types, control structures, functions/procedures, and one-dimensional arrays. Brief syllabus: programming process; syntax and semantics; declaring and defining variables/data; constant definitions; mixed data types; arithmetic expressions and precedence; assignment statements; input and output; program design techniques and approaches; program standards and styles; modules, subroutines, procedures and functions: flow of control; library functions; user-defined functions; relational expressions, logical expressions and precedence; selection statements; data validation; error handling; systematic debugging approaches; looping constructs; one dimensional arrays and their manipulation; sorting and searching techniques; string manipulation; enumerated data types and an introduction to record structures;

CS4456 Information Systems in Organisations (Autumn/7) (CSI 2-2-0)

4 hours per week; 13 weeks/6th semester; 26L/26T; ECTS credits:6

 This module will provide an overview of the computerised information systems, which support all aspects of a modern organisation's normal functions and activities. Emphasis will be placed on the formulation of an IS strategy which is aligned with and supports the organisation's business strategy. Students will be introduced to various approaches to the evaluation of investment in IT. Brief syllabus: development of IS applications since the introduction of electronic computing in the 1950s; the automate, informate and transformate phases; evaluating investment in information systems; the difficulty of attributing value to information systems; the information economics approach. IT - enabled business process re-engineering; the business potential of the internet, intranets, extranets; internet services - E-mail, World-Wide Web, E-commerce. *Prerequisite – Information systems incontext.*

CS4457 Project Management and Practice (CSI 2-1-1)

The aim of this course is 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. Brief syllabus: Management of IS projects can be the deciding factor in their eventual success or failure. This module covers the range of responsibilities of managing medium to large-scale information systems development projects, from project initiation to systems implementation. This course includes a study of the tools and techniques applicable to planning, monitoring and controlling the project.

CS4513 Introduction to Systems Analysis (Autumn/2) (CSI 2-1-2)

5 hours per week; 13 weeks/3rd semester; 26L/13T/26LAB; ECTS credits:6

The aim of this module is to present an integrated approach to system specification and implementation, with an emphasis on relational databases. The objectives are to introduce the system development lifecycle, the concepts of specification and implementation, some simple specification techniques, leading on to relational databases, SQL, database design using the Entity-Relationship approach; the Z notation; specifying and implementing database constraints. Brief syllabus: the system development life cycle; specification and Implementation; modelling facts in terms of predicates, sets, relations; the relational model of data; relational algebra and relational calculus SQL, simple queries, conditions and expressions; query nesting and union; views in SQL; entity relationship diagrams; the Z notation, schemas, predicates and constraints; database definition and manipulation using SQL; specifying and implementing database constraints.

CS4567 Component Based Software Engineering (CSI 2-2-1)

To equip students with the knowledge and techniques required to plan and control the development of software architectures with reusable components. The objective of this module is to create an intellectual framework that supports the development and reuse of components in software engineering. Brief syllabus: this module advances the material covered in the core modules Software Architectures, and, Systems Analysis & Design. This module focuses on higher-level concepts such as the principles guiding component modelling using UML, component development, the evolution of component architectures, and instances of such architectures, with a brief overview of suggested economic and marketing trends.

CS4815 Computer Graphics (Autumn/3) (CSI 2-1-0)

9 hours per week; 13 weeks/5th semester; 26L/26T/65LAB; ECTS credits:6

To understand the properties of Interactive Graphics Systems, viz. input & output devices, graphic libraries. To make the student conversant with the issues which arise in the creation, storage and display of graphic images both in 2 and 3 dimensions. To emphasise the role of standards in Computer Graphics. Brief syllabus: general structure of interactive graphics systems; input and output devices, raster scan devices, video memory models; establishing device, language and application independence; digitising analogue information; antialiasing; design and implementation of drawing algorithms for basic shapes; viewing functions, clipping functions, input and output primitives; control, transformation (rotation, scaling, translation, reflection, shears) and segmentation functions; modelling; 3-D transformations; projections; viewing in 3-D; representation of surfaces via polygons; realism; hidden surface removal; surface generation via bi-cubic curves; rendering. *Prerequisite CS4113*

CS4826 Human Computer Interaction (CSI 2-1-2)

The objective of this course is to develop an understanding of the issues involved in the increasingly important area of human-computer interaction. The course 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". Brief syllabus: the nature of HCI; understanding the user; human information processing; perception; interfaces and interaction; input and output devices; use & design; the design process; requirements; valuation; usability methods and tools; empirical and analytical methods; standards & guidelines; mobile technology; information appliances; social and organizational constraints; intelligent agents; future trends.

CS4913 Business Information Systems* (Autumn/2)

3 hours per week; 13 weeks/3rd semester; 26L/13T; ECTS credits:6

Growing importance of information systems management in business; components of a business information system; data management; role of the database; personal databases; shared databases; maintenance and security of databases; decision support systems; communication support systems; executive support systems; management of information systems; overview of systems development methodologies; data protection act, 1988.

CS4925 Business Information Technology I (Autumn/3)

3 hours per week; 13 weeks/5th semester; 26L/26T; ECTS credits:6

Introduction to fourth generation languages; structure of database management systems; systems development methodologies; systems analysis; feasibility study; gathering systems requirements; entity relationships diagrams; process descriptions; data type and structure; data flow diagrams; structure charts; detailed system design; data base design; user interface design testing; implementation; documentation; students will be expected to analyses, desing and develop a database application system. *Prerequisite module CS4913*

EE4001 Electrical Engineering (Autumn/1)

4 hours per week; 13 weeks/1st semester; 26L/26LAB; ECTS credits:6

Electrostatics; conduction; network analysis; magnetism.

EE4101 Electrical Science 1 (Autumn/1)

4 hours per week; 13 weeks/1st semester; 26L/26LAB; ECTS credits:6

Electrostatics; conduction: network analysis; magnetics.

EE4113 Circuit Analysis 1* (Autumn/2)

5 hours per week; 13 weeks/3rd semester; 26L/13Tl26LAB; ECTS credits:6

Bode plots; Feedback; transients; Laplace transform; computer simulation; second order systems.

EE4115 Systems Analysis (Autumn/3)

3 hours per week; 13 weeks/5th semester; 26L/13T; ECTS credits:6

Bode plots; poles and zeros; Laplace transform, application to circuit analysis, frequency response from pole-zero locations; computer simulations; second-order systems; Fourier series; filter design; Butterworth, Bessel,

Chebyshev. transmission line introduction; properties of selected lines.

EE4313   Active Circuit Design 1   (Autumn/2)

5 hours per week; 13 weeks/3rd semester; 26L/13T/26LAB; ECTS credits:6

Overview; diodes. Mosfets: JFETs: BJTs: IC components overview: BJTs Mosfets; biasing methods: small-signal models; amplifier types; differential; systems overview.

EE4317   Active Circuits Design 4* (Autumn/4)

5 hours per week; 13 weeks/7th semester; 26L/13T/26LAB; ECTS credits:6

IC components and technologies; IC design methods; frequency response; amplifier loading effects; IC op-amps; switched capacitor filters; power amplifiers.
Prerequisite EE4314

EE4407 ASICS 1 (Autumn/4)

5 hours per week; 13 weeks/7th semester; 26L/13T/26LAB; ECTS credits:6

Introduction to Design Methologies; UNIX; VLSI structures; design entry and simulation; hardware description languages; design for text.
Prerequisite EE4407

EE4427   Semiconductor Technology 1 (Autumn/4)

6 hours per week; 13 weeks/7th semester; 26L/13T/39LAB; ECTS credits:6

Integrated circuit technology; lithography; device packaging; clean room; process integration; reliability; yield.

EE4511   Digital Systems 1   (Autumn/1)

4 hours per week; 13 weeks/1st semester; 26L/26LAB; ECTS credits:6

Number systems and arithmetic; Boolean Algebra; Karnaugh Mapping; Gate characteristics; Latches and flip-flops; laboratory work.

EE 4513 Digital Systems 3*   (Autumn/2)

4 hours per week; 13 weeks/3rd semester; 26L/26LAB; ECTS credits:6

Classical von Neumann model. The basic microprocessor; Addressing modes: data movement instructions; the assembler and assembler directives; arithmetic and logic instructions; program control: processing text; stacks; cross-linking.
Perquisite EE4512

EE4607 Telecommunication Systems 1   (Autumn/4)

3 hours per week; 13 weeks/7th semester; 26L/13T; ECTS credits:6

Introduction to Communication Systems; transmission, T1-digital Carrier, Switching, Signalling, Local Loop, Inter-exchange signalling; mobile Communications, GSM, DECT, DCS-1800 UMTS; satellite communications, DBS, LEO's GPS; future of Telecommunications Systems

EE4817   Signals & Systems 2   (Autumn/4)

4 hours per week; 13 weeks/7th semester; 26L/26T; ECTS credits:6

Transforms; systems; signal windowing; non-recursive filters; recursive filters; filter transformation; noise.
Prerequisite EE4816

EE4907/EE4908 Electronic Engineering Project 1/2
The final year project is undertaken throughout the two semesters of the final year. The project is intended to give a student the chance to study a topic in depth and to apply his/her theoretical knowledge to a practical situation. Whilst working on the project he/she learns to direct their own work, be critical of their own methods and also to conduct detailed measurements and write a report presenting their results and reasoning. Students are expected to work on their project independently and must be available for consultation with their supervisor.
This module is only available for ERASMUS students who stay for the full academic year (2 semester) in the Department of Electronic and Computer Engineering (ECE). Students doing project work are required to find a supervisor themselves. It is advisable for students to investigate research areas of ECE at www.ece.ul.ie and to contact staff members regarding the availability of research projects before arriving in Limerick. However, it is quite usual that projects are agreed upon after the student has arrived.
It is anticipated that students will take up to 4 additional (taught) modules. This module gains 10 ECTS credits per semester (20 for the full year).
For further details please contact Dr Reiner Dojen (reiner.dojen@ul.ie).

ECEProject Full-time Research Project Electronic/Computer Engineering

The aim of this project is to undertake a project of significant import, which involves an advanced design and implementation task related to electronic or computer engineering. In general, students undertaking this project will work as members of a research team in the Department of Electronic and Computer Engineering (ECE). Students doing project work are required to find a supervisor themselves. It is advisable for students to investigate research areas of ECE at www.ece.ul.ie and to contact staff members regarding the availability of research projects before arriving in Limerick. However, it is quite usual that projects are agreed upon after the student has arrived.
Students undertaking this project are not allowed to participate in additional taught modules (except English as Foreign Language). This module is worth 30 ECTS credits per semester.
For further details please contact Dr Reiner Dojen (reiner.dojen@ul.ie).

ET4141 Analogue Electronics 1 (Autumn/1)

4 hours per week; 13 weeks/1st semester; 26L/13LAB; ECTS credits:6

This module will aim to provide an overview of analogue electronics and provide an introduction to the basic concepts of electrical engineering. An application based approach will be used to illustrate the fundamental principles that underpin modern electronic devices and products.

ET4005   Electronic Instrumentation* (Autumn/3)

5 hours per week; 13 weeks/5th semester; 26L/13T/26LAB; ECTS credits:6

Review basic electrotechnology; diode characteristic, temperature effects; useful circuits plus some circuits that will not work; other diodes, e.g., LED; Wheatstone Bridge network; general need for signal amplification; bipolar transistor; mosfets; loadline approach showing that a simple ac amplifier may be constructed; the op amp; decision-making; electronics, give suitable example e.g., green house monitoring/control system; comparators; digital logic elements; simple flip flops and counters; black box A to D and D to A converters plus necessary binary arithmetic; typical instrumentation systems with a variety of different input sensors; display systems.

ET4007 Test Engineering 1 (Autumn/4)

3 hours per week; 13 weeks/7th semester; 26L/13LAB; ECTS credits:6

The relationship between reliability, maintainability and risk. Basic electronic system fault diagnosis. Fault diagnosis in circuits; analogue, digital. Component functional and parametric testing. VI curve testing for black box circuits. Test techniques for complex digital ICs e.g. boundary scan. Signature analysis, test vectors, pseudo-random test patterns etc. Role of diagnostic programmes for self test. Review of some key test instruments. *Prerequisite ET4514*

ET4121 Laboratory Skills 1   (Autumn/1)

4 hours per week; 13 weeks/1st semester; 26L/26LAB; ECTS credits:6

Introduction to the electronic engineering laboratory: codes of conduct, operation of test and laboratory test and measurement equipment – power supply, signal generator, oscilloscope, circuit prototyping boards. Taking measurements and measurement equipment limitations. Electronic circuit prototyping, build and test: soldering, wire-wrapping, board design and layout, component choice and correct handling. Determining component values from the package coding. Printed Circuit Board (PCB) build and test, working in a project group environment.

ET4115 EMC (Autumn/3)

5 hours per week; 13 weeks/5th semester; 26L/13T/26LAB; ECTS credits:6

This module is intended to provide the student with a basic knowledge required to understand electromagnetic compatability issues (i.e. electrostatics, magnetics and radiation) and to use this knowledge to evaluate, measure and minimise E.M.I. emissions and susceptibility.

ET4131 Introduction to Computer Programming (Autum/3)
PC Structure: Introduce components of a PC such as RAN, ROM, CPU, Disks etc. Algorithms: decomposing larger problems into smaller ones, Flow-charts and Pseudo code. Common terms used in the programming world: Syntax, Semantics, compiler etc. Introduction to C: Features of C. Why use C. Fundamentals of C. Reserved words. Basic date types. C Programming: Format styles and good practices. Constants and variables. Operators and expressions. Input and output. Formatted output. Conditional and looping constructs. Functions. Arrays and pointers. File handling.

ET4141 Analogue Electronics 1 (Autumn/1)

4 hours per week; 13 weeks/1st semester; 26L/26LAB; ECTS credits: 6

The electric circuit: charge, current as the movement of charge, charge units, concept of electric field. Concept of energy loss and electrical work. Voltage and Resistance. SI Units. Simple series and parallel resistive circuits. Energy storage: Capacitors. Basic construction and types. Capacitors in series and parallel. R-C networks, qualitative observation and simple calculations for charge and discharge of a capacitor. Electromagnetism: concept of a magnetic field. Electromagnetic induction, Faraday's experiments. Concept of back e.m.f. leading to introduction of inductance. Simple calculations on R-L circuits, time constants, magnitudes of back e.m.f. etc Generation of Alternating Current: graphical interpretation of sinusoidal waveforms. Magnitude, frequency, phase angle, period. Application examples include simple generators, transformers, alternators, dynamos and basic electric motors. Amplitude and time delay effects of R-C and R-L circuits on AC signals. Efficiency. Frequency response of simple R-C and R-L circuits. Simple signal filters. Qualitative assessment of R-L-C circuits. Tuning, amplification, attenuation, bandwidth and Quality Factor.

ET4151 Digital Electronics 1

4 hours per week; 13 weeks/1st semester; 26L/26LAB; ECTS credits:6
The difference between digital and analogue signals. Binary numbers (unsigned) and how they can represent an analogue signal. Number systems and codes, Hexadecimal, ASCII code. Simple ADC and DAC concepts. Logic Gates: AND, OR and INVERTER gates and their truth tables. Representing data in parallel and in serial form, RS232. Buses and addressing: the concept of selecting a device by decoding a number on an address bus. Memory devices: basic types (NO internal workings) of semiconductor memory and how they are used. LED displays: including single LEDs and 7-segment displays and how to drive them. Modem basics. Sequential circuits: D-type flip-flops and registers; counters and their applications; shift register – serial – to parallel conversion (and vice-versa); Simple state diagrams. Mass Storage: discs, magnetic storage, sectors, data rates, optical storage, flash memory.

ET4203 Analogue Electronics 3 (Autumn 3)
4 hours per week;13 weeks/3rd semester; 26L/26LAB; ECTS credits: 6

Intro to structures and uses of semiconductor devices used in electronic circuits and systems. Topics: semiconductor materials: p-n junctions; basic semiconductor diode: structure and operation; other forms of semiconductor diodes: zener diode, Light Emitting Diode, photodiode; uses of the diode: voltage rectifiers in power supplies, LED displays; transistors, transistor operation; Bipolar Junction Transistor: structure and operation of npn and pnp transistor; Metal Oxide Semiconductor Field Effect Transistor: structure and operation of nMOS and pMOS transistor; uses: voltage amps, amp class, analysis of amp operation; power semiconductor devices: thyristor and triac; Data converters: ADC and DAC converters: architects and operation.

ET4205 Intelligent Instrumentation Systems (Autumn/3)

3 hours per week; 13 weeks/5th semester; 26L/13T; ECTS credits:6

This module introduces students to the key principles associated with the use and specification of intelligent instrumentation and to the use of a computer to control

systems and processes. At the end of this module students should be able to identify and troubleshoot the basic building blocks of an Intelligent Instrumentation System and to use a computer to sample, identify and improve the performance of simple dynamic systems. *Prerequisite ET4103*

ET4213 Digital Electronics 3 (Autumn/3)

4 hours per week ; 13 weeks/3rd semester ;26L/26LAB ; ECTS credits : 6

Intro to microprocessor based electronic systems and design of digital electronics using Hardware Description Languages. Topics: Microprocessor – concepts, history overview, application areas; Architecture – block diagram model of 8-bit processor, microprocessor as programmable device. CPU, RAM, ROM. Address, data and control buses; Internal operation of microprocessor – overview of internal operation of simple microprocessor at block-diagram level, data path and control logic, fetch-decode-execute cycle ; I/O Devices – input/output devices, examples of serial and parallel I/O ports ; Memory Maps and I/O Maps – memory maps, I/O mpas, combined memory and I/O map. Memory and I/O decoding. Basic memory read and wrtie cycles ; Intro to digita l circuit and system design with Hardware Description Languages : Verilog-HDL and VHDL. VHDL – modelling digital circuits in VHDL, synthesis.
Prerequisite ET4512

ET4214 Electronic Production 1 (Autumn/2)

5 hours per week; 13 weeks/3rd semester; 26L/13T/26LAB;ECTS credits:6

Fabrication of passive components

ET4215   Electronic Production 2 (Autumn/3)

5 hours per week; 13 weeks/5th semester; 26L/13T/26LAB; ECTS credits:6

PCB assembly techniques, thru-hole and surface mount technology, thick and thin film hybrid technology; process defects and assembly failure mechanisms; effect of assembly process on electronic components reliability; concept of reliability, the bathtub curve, infant mortalities and concept of stress screening; the Ahrennius equation; MTBF and the principles of accelerated life testing; limitations of the Ahrennius approach in electronics production; Intro in international screening standards.
Prerequisite ET4214

ET4223 Embedded Software 1 (Autumn/3)
4 hours per week ; 13 weeks/3rd semester ;26L/26LAB

Description of embedded system. Detail of application aras and examples.
Intro to simple microprocessor architecture. Registers, buses and memory organization and use in embedded applications. Memory and I/O devices. Memory and I/O accesses. Details instruction machine formats and instruction decoding. Intro to instruction sets, addressing modes, data move instructions, arithmetic instruction, stack operation and usage, Program flow control instructions, sub routines and loops.
Detail assembler directives and program translation process. Review the build and load process for embedded application programs. Simulation tools and debugging techniques. Monitor program and use to test applications using target hardware.
Control/communicate with I/O devices through polling and interrupts. Interrupt service routines, interrupt priority, multiple interrupts, nesting.

Practical programming examples to illustrate concepts.
Prerequisite Computer Programming 1, Digital Electronics 1

ET4225   Industrial Automation (Autumn/3)

5 hours per week; 13 weeks/5th semester; 26L/13T/26LAB; ECTS credits:6

Motors used in motion control, drive electronics, controllers, sensors/transducers, computer based controllers, pneumatics, programmable logic controllers (PLC's) and industrial networks; design of automated work cells and the integration and control of automated processed/work-cells within the production environment.
Prerequisite ET4103

ET4233 PCB Design (Autumn/3)
4 hours per week;13 weeks/3rd semester; 52LAB; ECTS credits: 6

Intro to Printed Circuit Board design. Technology and design methods, toolsets used. Topics: Intro to PCB technology – materials, design methods, manufacture and test. Use of software toolsets for PCB design – schematic capture, simulation and layout. PCB layout techniques. PCB design standards. Technology trends for PCBs.
Prerequisite ET4314, ET4512

ET4243 Web and Database Technology 2

4 hours per week; 13 weeks/3rd semester; 26L/26LAB; ECTS credits:6

Data models and data base architectures. Database Management System: typical functions/services and major components. The relational database model: intro and additional concepts. Database design methodology: conceptual, logical and physical database design phases. Intro to Structured Query Language: 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 and ActiveX Data Objects; intro to scripting languages. Web database programming case study.

ET 4244 Outcome-based Learning Laboratory 2 (Autumn)

4 hours per week; 13 weeks/3rd semester; 26L/13T/26LAB; ECTS credits:6

Design of dynamic web based user oriented systems, top down, bottom up design. Extraction and display of real world data. Data transmission point to point and through networks. Data exchange in multipoint systems. Data manipulation and storage on a PC. Interfacing PC to external system directly/over a network. Control of simple devices via active web pages. Data display in user-friendly format, graphic displays, data on demand.
Prerequisite ET4112

ET 4253 Computer systems Architecture 2

4 hours per week; 13 weeks/3rd semester; 26L/26LAB; ECTS credits:6

Pentium and later microprocessors and simple RISC and CISC concepts; Protected Mode operation and relationship to Windows operating system; P4 incorporation of RISC techniques. Architecture of modern PC, showing memory and bus hierarchies, use of caches in memory hierarchy. Legacy of ISA bus and Real Mode; Introduction to PCI and other internal PC buses. Use of the BIOS in a PC and its relationship to application programs and the operating

system. Use of device drivers in a PC. I/O standards, including USB, IEEE 1394, serial and parallel interfaces. Disk and mass storage interfaces and standards; video and graphics standards. Role of motherboard; evolution of the PC. Project work.

ET 4263 Java Programming I

4 hours per week; 13 weeks/3rd semester; 26L/13T/26LAB;ECTS credits:6

Introduce students to Java language and compar e it to C. Baic data types, control statements and methods. Impart basic understanding of object oriented software development. Introduce Java documentation,. Investigate role of Java Virtual Machine. Introduce Java Class Libraries. Introduction to UML. Introduce Java development environment. Complete simple programming assignements to drive home Java syntax and use of its development tools. *Prerequisite ET4702*

ET4345 Operating Systems 2 (Autumn/5)

4 hours per week;13 weeks/5th semester;26 L/26LAB; ECTS credits: 6

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.

ET4335 Protocols Laboratory (Autumn/5)

The aim of this module is to offer the students a 'learn-by-doing' approach in communications and computer networks, for a better understanding of how networking technologies, mainly network protocols, operate in practice. Using appropriate laboratory facilities (real network equipment, protocol analysis software), the students will be allowed to observe, measure and experiment various communications protocols. It provides the student with a comprehensive coverage of computer networking, with a strong practical emphasis.
At the completion of the module, students should have an understanding of the important issues in providing communications software for various types of computer networks. This includes LAN medium access protocols, WAN data link protocols and the TCP/IP protocol stack, mainly focusing on application protocols like file transfer, network management and network security.
Introduction to Layered Architectures, Basic Concepts: Open Systems, Layering, Peer Protocols, Primitives & Services
Reference Models: telecommunications vs. computing approaches, OSI and TCP/IP
Layer Functions: Network vs. Application
Layer 2 LAN protocols: Ethernet, Token Ring and FDDI: basic characteristics, frame types, fields and troubleshooting tips; capture and decode frames;

WAN protocols: HDLC, X.25, Frame Relay, PPP; ATM: basic characteristics, frame types, fields and troubleshooting tips, capture and decode frames;
TCP/IP protocol stack: IP and Ipv6, TCP & UDP: functions & packet structure, protocol analysis, debugging tips; capture and reassemble packets, extract data;
Client/Server software used by TCP/IP protocols; design and implementation for Client programs;
Network management: SNMP case study
Network security: PGP case study

ET4355 Java Programming 3 (Autumn/5)

4 hours per week; 13 weeks/5th semester; 26L/26LAB; ECTS credits:6

To introduce the student to basic dynamic data structures (e.g. queue, trees) and Java Collections. Introduce numerical methods and the growth of functions. Investigate Java Database connectivity, servlets and Java server pages. At the end of this module students should be completely familiar with all aspects of the Java language, its use in; a standalone programming environment, a client based applet, a server based servlet. In addition students should be familiar with fundamental numerical and data manipulation algorithms.
Data structures - Self referencial classes, Dynamic Memory allocation, Linked lists, Stacks, Queues and Trees.
Introduction to the Vector, Stack, Hashtable, Properties and BitSet classes.
Java Collections - Arrays, Interface COLLECTION and class COLLECTIONS, Wrappers.Java support for Multimedia. Java Database Connectivity. Servlets. JavaServer Pages.
Case Study of a moderate to large Java applications.
Software engineering practices including design (UML) and testing techniques.
Major development project.

ET4365 Communications and Networking 2 (Autumn/5)

4 hours per week; 13 weeks/5th semester; 26L/26LAB; ECTS credits:6

The aim of this module is provide a firm grounding in the principles and practice of computer and communications networking. The module focuses on topics in LANs and internetworking.At the completion of the module, students should understand:
        networks principles and concepts
        the operation of LANs
        principles of internetworking
        routing in LANs and internets
        network layer protocols
        the IP layer
        the Transport layer
        some TCP/IP applications
Review of Communication networks definitions and concepts, OSI reference model, TCP/IP reference model LAN architecture and topologies, Medium Access Control, CSMA/CD.Wired LANs; Bridges; Routing concepts.
Overview of Internetworking principles and concepts.
Network and internet routing algorithm principles;
Network layer protocols; IP Layer; ICMP, BGP routing protocol, RIP & OSPF protocols.Address Resolution, ARP, RARP. Transport layer, TCP & UDP; TCP/IP applications, client-server model; DNS; Email, SMTP; Security; WWW, http

ET4417 Communications and Networking 3

5 hours per week; 13 week/7st semester; 39L/26T; ECTS credits:6

The aim of this module is provide further study in computer and communications networking. The module focuses on more advanced topics in internetworking. At the completion of the module, students should have an understanding of advanced IP topics, multicasting, multimedia and voice distribution over the internet, network security issues and have an appreciation of other network types.
Review of networking and internetworking concepts and principles
IP layer: IPv6, IGMP, Multicast, M-Bone;
Data traffic, Congestion control;
Quality of Service: Traffic Shaping, Resource Reservation (RSVP),
Diffserv, Integrated Services, MPLS
Multimedia networking, Voice over IP: RTP, RTCP, SIP, H323;
Network Management, SNMP;
Network Security: cryptography, authentication; Kerberos, IPSec, PGP, Firewalls,
Virtual Private Networks;
Metropolitan Area Networks; Wide Area Networks: circuit switched, packet switched;
Frame Relay;Topics in ATM: ATM LANs and WANs

ET4437 Distributed Computing and Java (Autumn/7)

4 hours per week; 13 weeks/7th semester; 26L/26LAB; ECTS credits:6

To introduce the student to Java and Distributed Computing including Remote Method Invocation and JavaBeans. To examine the role of Java in Distributed Systems and Web based Services including Security issues. In addition XML and advanced GUI features will be investigated.
On completion of this module the student should have an appreciation of the issues pertaining to the use of Java in a large Distributed Enterprise Environment.
JavaBeans Component Model, Creating a JavaBean.
Security - Digital Signatures, Java Keystores, Java Authentication and Authorization Service.
Java-based Wireless Applications and J2ME.
Remote Method Invocation.
Enterprise JavaBeans and Distributed Transactions.
Messaging with the Java Messaging Service (JMS).
Jini - plug and play interfaces, discovery services.
JavaSpaces - Communicating and sharing information in asynchronous environments
Peer-to-Peer Applications.
Case Study.
Extenible Mark-up Language (XML) and Simple Object Access Protocol (SOAP).
Major programming project.

ET4727 Artificial Intelligence & Expert Systems (Autumn/4)
Elective module – may change at short notice
4 hours per week; 13 weeks/7th semester; 26L/26LAB; ECTS credits:6

Expert system; expert systems with representative examples; knowledge acquisition and representation; inference mechanisms; programming environments for expert systems; the user interface; implementation strategies; expert system testing and validation; artificial intelligence; examination of representative applications such as in problem solving, symbolic mathematics, heuristic searching, vision, patter recognition, motion control and robotics.

ET4807 DSP (Autumn/4)
Elective module – may change at short notice
4 hours per week; 13 weeks/7thsemester; 26L/26LAB; ECTS credits:6

Introduction to systems and signal processing. Review of frequency domain analysis. Impulse functions, impulse responses and convolution. Line spectra and Fourier Series. Spectral density functions and the Fourier transform. Sampling and reconstruction. Digitalisation of signals. Discrete Fourier Transform, applications, fast Fourier Transform. Introduction to digital networks and the z-transform. Digital filters, correlation, processing techniques for band pass signals. Digital filter realisation and implementation. Digital signal processing applications.

MA4001   Engineering Mathematics 1 (Autumn/1)

5 hours per week; 13 week/1st semester; 39L/26T; ECTS credits:6

Series functions; limits, continuity and differentiation from first principles; transcendental functions; vector algebra; complex numbers; differential calculus; properties; maxima and minima, curve sketching, roots of equations; undetermined forms; power series.

MA4003 Engineering Mathematics 3 (Autumn/2)

4 hours per week; 13 weeks/3rd semester' 39L/13T; ECTS credits:6

Vector Spaces; Inner Products, norms, orthogonality; Eigevnalues and eigenvectors. Diagonalisabiility; Numerical solution of systems of linear equations; iterative methods; nonlinear systems using Newton's method.

MA4005 Engineering Maths T1 (Autumn/3)

6 hours per week; 13 weeks/5th semester 39L/39LAB; ECTS credits:6

The indefinite integral; numerical integration; ordinary differential equations; the Laplace Transform; Fourier series; matrix representation of and solution of systems of linear equations; vector spaces; numerical solution of systems of linear equations; Gauss elimination, LU-decomposition.

MA4007   Experimental Design (Autumn/4)

3 hours per week; 13 weeks/7th semester; 26L/13T; ECTS credits:6

Multiple regression: analysis of variance; robust techniques; statistical experimental design; full and fractional factorials, composite design, orthogonal arrays; evolutionary operations.
Prerequisite MA4004

MA4103 Business Mathematics 2   (Autumn/2)

3 hours per week; 13 weeks/3rd semester; 26L/13T: ECTS credits:6

Functions and graphs: review of standard functions, linear, quadratic, polynomial, exponential and log. Differential calculus: continuity and differentiability, sum, product, quotient, chain rules, implicit differentiation, maxima and minima, business applications. Integrals and integration: indefinite, definite integrals, integration

techniques including anti-derivative, substitution and integration by parts, integrals involving logs and exponentials, business applications. Functions of two variables: partial derivatives, relative maxima and minima, optimisation. Introduction to first order differential equations with applications to business. Matrices: solving linear systems by row reduction, eigen values for 2x2, and 3x3 matrices, Input-Output analysis.

MA4125 Introduction to Computer Aided Data Analysis (Autumn/3)

5 hours per week; 13 weeks/5th semester; 26L/13T/26LAB ; ECTS credits:6

Defining the research problem, formulating the research questions, quasi-experimental research designs, sources of data, data protection legislation, SQL, designing the data collection mechanisms, introduction to a suitable computing environment, date input, descriptive statistics and graphical methods, data analysis and interpretation including inference for a single proportion, a single mean, the difference between two proportions, and the difference between two means; the chi-squared test applied to contingency tables, simple linear regression and correlation, criticisms of data analysis with particular emphasis on the drawing of incorrect inferences due to poor design and/or poor analysis, report writing.

MA4402 Computer Maths 2 (Autumn/1)

3 hours per week; 13 weeks/2nd semester; 26L/13T; ECTS credits:6

Real-value functions, simple numerical methods, matrices, graph theory.

MA4403 Computer Maths 3 (Autumn/2)

3 hours per week; 13 weeks/3rd semester; 26L/13T; ECTS credits:6

Combinatorics; probability; introduction to information theory; normal, Poisson and binomial distributions; hypothesis testing, elementary queuing theory

MA4505 Applied Statistics for Administration 1 (Autumn/3)

3 hours per week; 13 weeks/5th semester; 26L/13T; ECTS credits:6

Simple design and sampling methods; probability concepts; discrete probability distributions; continuous probability distributions; statistical inference and sampling; hypothesis testing; one-way ANOVA; linear regression; introduction to time series and index numbers.

MA4601 Science Mathematics 1 (Autumn/1)

3 hours per week; 13 weeks/1st semester; 26L/13T; ECTS credits:6

Vectors definition; addition; components, resultant, position vector; scalar product; dot product and angle between vectors; cross product; simple applications in mechanics. Complex Numbers: necessity and definition; algebra including multiplication, conjugate, division, modulus; Argand diagram representation; polar form, argument; exponential form; de Moivre's theorem, powers and roots. Trigonometry: basic definitions and relation to unit circle; basic formulae and identities; frequency, amplitude and phase; more formulae using complex exponential. Linear equations: solution of systems of linear equations by Gaussian elimination; examples with a

unique solution, an infinite number or no solutions. Matrices: Addition and multiplication; matrix inversion; simple determinants. Functions: graphs and functions; polynomial and algebraic functions; curve-fitting; least-squares approximation formula only; exponential and logarithm; inverse function; limits and continuity. Derivative and applications basic concepts: slope as rate of change; differentiation of sum, product, quotient; chain rule; derivative of standard functions; tangent and normal; higher derivatives; maxima and minima; applications to optimisation in science.

MA4603 Science Mathematics 3 (Autumn/2)

3 hours per week; 13 weeks/3rd semester; 26L/13T; ECTS credits:6

Variables; representation of variables; reduction of variables; introduction to the fundamentals of probability; Baye's theorem; introduction to random variables; special distributions; binomial, Poisson, geometric, uniform, exponential, normal; statistical inference; non-parametric tests; correlation and regression. *Prerequisites MA4601,MA4602*

MA4605 Chemometrics (Autumn/3)

3 hours per week; 13 weeks/5th semester; 26L/13T; ECTS credits:6
Statistical process control; capability studies; correlation and regression; multiple regression; importance of plotting data; design of experiments of variance; factorial designs; Plackett-Burman design. *Prerequisite MA4603*

MA4607 Introduction to Applied Mathematical Modelling in Continum (Autumn/4)

3 hours per week; 13 weeks/7th semester; 26L/13T; ECTS credits:6

Continuum theory, balance of momenta, constitutive laws, elementary viscous flow, waves, aerofoil theory, vortex motion, Navier Stokes equations, very viscous flow, thin film flow, boundary layer theory, instability and turbulence, introduction to linear elasticity and rheology, illustrative real examples from the sciences.

MA4701 Technological Mathematics 1 (Autumn/1)

3 hours per week; 13 weeks/1st semester; 26L/13T; ECTS credits:6

Functions; trigonometry; the derivative and its applications; experimental laws; linear equations; vectors; complex numbers

MA4707 Quality Management (Autumn/4)

3 hours per week; 13 weeks/7th semester; 26L/13T; ECTS credits:6

History of quality; Quality organisation; Quality Planning; Standards and Vendors; Modern Quality development; Continuous improvement strategy, Economics of Quality

MA4713 Technological Mathematics 3A (Autumn/2)

4 hours per week; 13 weeks/3th semester; 39L/13T; ECTS credits:6

Further Integrations; ordinary differential equations; Laplace Transforms.

MA4715 Technological Mathematics 5A (Autumn/3)

3 hours per week; 13 weeks/5th semester; 39L/13T; ECTS credits:6

Fourier Series; Linear Algebra; Linear Programming; Discrete mathematics.

MB4001   Algebra 1 (Autumn/1)

3 hours per week; 13 weeks/1st semester; 26L/13T; ECTS credits:6

Number : basic number concepts; number systems; elementary number theory; solution by graphical and numerical methods; matrices; applications.

MB4005 Analysis (Autumn/3)

3 hours per week; 13 weeks/5th semester; 26L/13T; ECTS credits:6

Functions of a real variable; differentiability; set theory; Bolzano-Weirstrass theorem; sequences and series; general topology; integration; Riemann integral, basic integration theorems, improper integrals; functions of a complex variable; differentiability; complex integration; residues; complex power series; applications. *Prerequisite: MA4701*

MS4007 Mathematical Methods 1 (Autumn/4)

3 hours per week; 13 weeks/7th semester; 26L/13T; ECTS credits:6

Functions of a complex variable including the Cauchy-Riemann equations, Cauchy's theorem, singular points, complex integration, residue theorem. Application of residue theorem to the inversion of Laplace transforms. Conformal mapping and its application to solving Laplace's equation in two dimensions The Fourier transform and its relationship to the Laplace transform. Solution of linear partial differential equations by integral transform methods such as the Fourier and Laplace transform. Solution by separation of variables of some linear partial differential equations such as Laplace's equation, the heat equation and the wave equation.

MS4013 Fourier Analysis   (Autumn/2)

3 hours per week; 13 weeks/3rd semester; 26L/13T; ECTS credits:6

Orthogonal sets of functions; inner products of vectors, orthogonality, orthonormal sets of vestors, functions as vectors andorthogonality, generalised fourier series, approximation in the mean, closed and complete systems, orthogonal functions generated by differential equations; fourier series; definition, periodicity, even and odd functions, sine and cosine series, half range series, piecewise continous functions, fourier theorem, orthonormal trigonometric functions, differentiation and integration of fourier series, uniform convergence, applications e.g. inhomogeneous ODEs, fourier integral, outline of sturmm liouville theory;linear transforms, laplace tranform and properties, application to simple odes fourier transform and properties, applications in signal analysis, introduction to green's functions and distributions, fast fourier transform, discrete fourier transform; introduction to wavelets; basic concepts, compact support, localised approximation

MS4021 Calculus 1   (Autumn/1)

3 hours per week; 13 weeks/1st semester; 26L/13T; ECTS credits:6

Field of real numbers and complex numbers; sequences, series; the derivative and differentiation techniques; properties of transcendental functions ; functions of the two variables.

MS4025 Applied Analysis   (Autumn/4)

3 hours per week; 13 weeks/5th semester; 26L/13T; ECTS credits:6

To introduce students to the standard techniques of complex analysis, integral equations and Green's functions and to demonstrate applications of these techniques. *Prerequisite MS4013*

MS4101 Mathematical Laboratory (Autumn/1)

5 hours per week; 13 weeks/1st semester; 26L/39LAB; ECTS credits:6

Structure of a digital computer; introduction to MS-DOS and its command language; introduction to MS-WINDOWS; using a spreadsheet (MS EXCEL) as a tool for manipulation, analysis and graphical display of data; using a symbolic algebra package (MAPLE) for the analysis and solution of simple mathematical models.

MS4105 Linear Algebra 2 (Autumn/3)

3 hours per week; 13 weeks/5thsemester; 26L/13T; ECTS credits:6

The aim of this module is to introduce some more advanced concepts in Linear Algebra and Numerical Linear Algebra. *Prerequisites MS4131 and MS4013.*

MS4117 Discrete Mathematics 2 (Autumn/4)

4 hours per week; 13 weeks/7thsemester; 26L/13T/13LAB; ECTS credits:6

Graphs, directed graphs and their computer representation. Graph algorithms. Graph colouring with applications. Network flows and matchings. Planar graphs and Hamiltonian graphs. *Prerequisite MS4132*

MS4131 Linear Alegbra 1* (Autumn/1)

3 hours per week; 13 weeks/1st semester; 26L/13T; ECTS credits:6

Systems of linear equations and their solution by an elimination method. Matrices, matrix algebra, determinants,
inverses, methods for "small" matrices, extensions to larger matrices. Vectors in 2 and 3 dimensions, geometric interpretation of vectors, vector arithmetic, norm, scalar product, angle, orthogonality, projections, cross product and its uses, lines and planes in 3 space. Extension to vectors in n dimensions, vector algebra, scalar product, orthogonality, projections, bases in R^2 , R^3, and R^n. Matrices acting on vectors, eigenvalues and eigenvectors esp. in 2 and 3 dimensions. Applications to (some of, and eg) input-output models, least squares fit, simple Markov chains, geometric transformations, diagonalisation of matrices.

MS4213 Probability Theory (Autumn/2)

3 hours per week; 13 weeks/3rd semester; 39L; ECTS credits:6

Elementary probability, sample space, events, compound events, the laws of probability, conditional probability, independence; random variables, probability distribution,

probability density, moments, expectation, variance; binomial, Poisson, Geometric, uniform, normal, exponential, gamma, chi-squared joint probability distributions, conditional distribution, covariance; functions of a random variable, distribution of sum, difference, product, and quotient of two random variables; introduction to Markov chains.

MS4214 Statistical Inference   (Autumn/2)

3 hours per week; 13 weeks/4th semester; 26L/13LAB; ECTS credits:6

This course introduces students to the formalities of statistical inference with special emphasis on problems of estimation, confidence intervals and hypothesis testing. *Prerequisites MS4212, MS4213*

MS4215   Advance Data Analysis 4 (Autumn/3)

3 hours per week; 13 weeks/5th semester; 26L/13T; ECTS credits:6

Simple Linear Regression : calibration, reverse prediction, regression through the origin, analysis of residuals, regression diagnostics, leverage and influence. Matrix formulation of the linear model : Multiple regression, partial correlation, polynomial regression. Analysis of Variance : One-way ANOVA, multiple comparisons, Two-way ANOVA, interactions, Analysis of covariance. Introduction to Generalized Linear Models including non-linear regression, logistic regression and log-linear models.

MS4217   Stochastic Processes (Autumn/4)

4 hours per week; 13 weeks/7tht semester; 26L/13T/13LAB ; ECTS credits:6

Conditional probability and conditional expectations; Markov chains, Chapman-Kolmogorov equations, classification of states, limiting distributions, random walks, branching processes, time reversible Markov chains; Renewal Theory, counting processes, the Poisson process, semi-Markov processes; Queuing theory, the M/G/I and G/M/I systems, multiserver queues; continuous-time Markov chains, birth and death processes; Brownian motion with application in option pricing. *Prerequisite MS4213*

MS4315 Operations Research 2   (Autumn/3)

3 hours per week; 13 weeks/5th semester; 26L/13T; ECTS credits:6

This module introduces further Operating Research technique for decisionmaking; Monte Carlo methods; simulation; integer programming; deterministic dynamic programming; probabalistic dynmic programming and Network problems. *Prerequisite MS4303*

MS4403 Ordinary Differential Equations (Autumn/2)

3 hours per week; 13 weeks/3rd semester; 26L/13T; ECTS credits:6

Linearity. Review of first order equations. Second order linear equations. Series solution. Sturm-Liouville theory. Nonlinear ODEs. Regular perturbation techniques.

MS4407 Perturbation techniques and asymptotics (Autumn/4)

4 hours per week; 13 weeks/7th semester; 26L/13T/13LAB; ECTS credits:6

Non-dimensionalisation, scaling, ordering, definition of asymptotic series, algebraic equations, integrals, Laplace's method, method of steepest descent, regular and singular perturbations, multiple scales, strained coordinates, boundary layer techniques. *Prerequisites MS4403, MS4404*

MS4517 Theory of Mathematical Finance (Autumn/4)

4 hours per week; 13 weeks/1st semester; 26L/13T; ECTS credits:6

4 hours per week; 13 weeks/7th semester; 26L/13T/13LAB; ECTS credits:6

Introduction to Continuous-Time Finance and Stochastic Calculus : The basic building blocks – standard Brownian motion and generalised Ito processes. Basic properties of Markovian processes. Ito's Lemma. The Ito integral and the stochastic differential equation representation of dynamic asset pricing systems. The Kolmogorov forward and backward equations. Probability spaces and filtrations – martingale processes and conditional expectations. Introduction to arbitrage-free pricing and the existence of an implied equivalent probability measure. The Girsanov and Feyman-Kac theorems. Martingales and Diffusive PDE's. Derivation of Black-Scholes using the Martingale approach. Discrete-time modelling of unpredictable errors in continuous-time dynamic systems – discrete random variables and their convergence to Brownian Motion (application of Donsker's Theorem). Complete Markets, No-Arbitrage and Equivalent Martingale Measures: Theoretical foundations for arbitrage-free pricing of financial securities. Fundamental / pure securities and state prices. "No-arbitrage" characterisation of state prices (application of the Separating Hyperplane Theorem). Popular applications of the risk-neutral valuation paradigm - i) the Cox-Ross-Rubinstein binomial stock-option pricing model, and ii) an introduction to the Heath-Jarrow-Morton model of the evolution of the interest rate term structure. Introduction to Equilibrium-Based Asset Pricing: Partial equilibrium and 'market-clearing' security prices. Definition of 'pareto-optimality' and equilibrium-based characterisations of state prices in capital markets. Theoretical equivalencies with the APT model of capital market equilibrium. *Prerequisite FI 4505, MS4213, MS4404*

MS4613 Vector Analysis   (Autumn/2)

3 hours per week; 13 weeks/3rd semester; 26L/13T; ECTS credits:6

Vectorial mechanics: rotation of axes, index notation, review of vector and scalar algebra (scalar vector and triple scalar products); vector functions of a real variable, functions of time; differentiation of vectors, derivative of dot and cross products, tangent to a curve, arclength, smoothness, curvature applications in mechanics. Fields; scalar and vector fields; functions of severalvariables, maxima/minima, contourmaps, directional derivative and gradient vector field; applications in electromagnetism and fluid mechanics; vector identities; cylindrical and spherical coordinates. Line, surface and volume integrals and work; conservation of energy and potential function; applications to planetary dynamics, area, surface and volume integrals; gauss's green's and stokes's theorems multiple integrals in radial, cylindrical and spherical coordinates, scalar and vector potentials, helmholtz's theorem tensor algebra and calculus: review of matrix algebra introducing suffix notation; definition of determinant; evaluation of determinants by row and column expansion.

MS4627 Topics in Fluid Dynamics (Autumn/4)

4 hours per week; 13 weeks/7thsemester; 26L/13T/13LAB; ECTS credits:6

Topics from: slow flow, waves and viscous flow, boundary layer theory, flow instabilities, geophysical fluid dynamics, computational fluid dynamics, classical aerofoil theory. *Prerequisites MA4607, MS4404*

TA4001 Introduction to Science & Technology 1 (Autumn/1)

3 hours per week; 13 weeks/1st semester; 26L/13T; ECTS credits:6

For Business/Humanities students. Development of our understanding of the universe; the nature of scientific laws; gravitation; energy, conservation and thermodynamics laws; energy conversion and it's applications; application of laws of mechanics to transportation; modern concepts of electricity and magnetism; electrical power generation and electronics; analogue and digital electronics; information technology; signal coding, transmission, networks, the internet.

TA4003 Introduction to Science & Technology 3* (Autumn/2)

3 hours per week; 13 weeks/3rd semester; 26L/13T; ECTS credits:6

For Business/Humanities students. Darwinism; genetics and molecular biology, genetic engineering; disease and modern treatment methods, vaccination, drugs and surgery; food production and processing techniques; pollution problems; economics of pollution prevention; science and social structure; critique of modern attitudes to science. *Prerequisite TA4002*

ID4811   Industrial Design 1 (Autumn/1)

7 hours per week; 13 weeks/1st semester; 13L/26T/52 LAB; ECTS credits:6

Design methods; an approach to design working to a brief; design techniques; drawing and modelling skills, practical development of the manual and mental skills of idea development and communication; design history; an overview of industrial design in the context of social and economic conditions.

IE4115 Introduction to Industrial Engineering (Autumn/3)

4 hours per week; 13 weeks/5th semester; 26L/26T; ECTS credits:6

Objectives and tools; work design methods; performance prediction; interest calculations; risk assessment; replacement decisions.

IE4711 Manufacturing Integration (Autumn/1)

4 hours per week; 13 weeks/1st semester; 26L/26Lab; ECTS credits:6

Manufacturing Documentation; manufacturing process charts; spreadsheet procedures; for manufacturing calculations; manufacturing cost estimates.

ME4111 Engineering Mechanics 1 (Autumn/1)

4 hours per week; 13 weeks/1st semester; 26L/26LAB; ECTS credits:6

Application of Newton's Laws to particles and rigid bodies in equilibrium (Static's); equivalent force systems; two-and-three-dimensional force systems in equilibrium; analysis of rigid trusses and frames; centurions, centres of gravity, distributed forces, area and mass moments of inertia; friction.

ME4113   Applied Mechanics (Autumn/2)

4 hours per week; 13 weeks/3rd semester; 26L/26LAB; ECTS credits:6

Kinematics of simple mechanics and linkage; analysis of four bar linkages, straight line mechanisms, use of velocity and acceleration diagrams; Coriolis analysis; cams; Kinematics analysis of follower motion, velocity and acceleration of cams, construction of cam profiles, computer aided design of cams; forces analysis of cams; gears; gear kinematics and dynamics, simple and compound trains; epicyclical gears, referred inertia, toque and power transmission; balancing; balancing of rotors, static and dynamic balance, balancing of reciprocation masses; Gyroscope; gyroscope analysis and gyroscopic effects.

ME4117   Vibration Analysis* (Autumn/4)

4 hours per week; 13 weeks/7th semester; 26L/26LAB; ECTS credits:6

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.
Prerequisite ME4111

ME4121 Engineering Science 1 (Autumn/1)

4 hours per week; 13 weeks/1st semester; 26L/26T; ECTS credits:6

Mass, force, weight; forces in equilibrium; frameworks; stress and strain; shear stress; shear force diagrams, bending moment diagrams; friction; velocity, acceleration, relative velocity; motion in a circle; simple harmonic motion; work, energy, power.

ME4213 Mechanics of Solids 1* (Autumn/2)

4 hours per week; 13 weeks/3rd semester; 26L/26LAB; ECTS credits:6

Uniaxial stress and biaxial strain fields; constitutive relations; shear force and bending moment diagrams; bending of beams; transverse shear stress in beams; composite beams; temperature stress; torsion of cylindrical sections; analysis of stress at a point in 2D; principal stress and Mohr's stress circle; thin cylinders and thin spherical vessels.
Prerequisite ME4112

ME4217   Mechanics of Solids 3 (Autumn/4)

4 hours per week; 13 weeks/7th semester; 26L/26LAB; ECTS credits:6

Stress at a point in 3D, strain at a point (including finite strain) in 3D, theory of 3D strain rosettes and embedded moiré grids; constitutive relations; equilibrium and compatibility; stress functions (various applications); holography and the measurement and separation of

deformation u, v and w; case studies demonstrating a hybrid approach to metrology.
Prerequisite ME4213

ME4223 Fundamentals of Aerospace Engineering (Autumn/2)

4 hours per week; 13 weeks/3rd semester; 26L/13T/13LAB; ECTS credits:6

The syllabus will comprise of various topics seleted from the following list on the basis of availability of guest industrial/academic exprts; air accident investigation; aircraft aerodynamics; aircraft maintenance; aircraft performance; aircraft propulsion systems; aircraft stability and control; aircraft structural design and fabrication; computational engineering software; experimental techniques; astrodynamics; gas turbine overhaul; rotary wing aircraft; spacecraft design; spacecraft propulsion systems; technical report writing and presentation skills will always be covered.

ME4227 Aircraft Structure 2 (Autumn/4)

4 hours per week; 13 weeks/7th semester; 26L/26LAB;ECTS credits:6

Theory of elasticity; Airy stress function.   Energy methods for structural analysis.   Shear and torsion of open and closed thin walled sections, single and multicell sections.   Bending and twisting of thin plates.   Structural instability; inelastic buckling, buckling of thin plates. Laminated composite structures; stress analysis, failure criteria.   Stress analysis of aircraft components; fuselages, wings. Application of proprietary structural analysis software packages and the application of Finite Element Analysis to aircraft structures.

ME4417   Boundary Layer Theory* (Autumn/4)

4 hours per week; 13 weeks/7th semester; 26L/26LAB; ECTS credits:6

The derivation of the three-dimensional viscous, steady compressible equations of the conservation of mass, momentum and energy; the distinction between differential and integral solutions; differential solutions for simple pipe flow with heat transfer and coquette flow; the Von-Karmen integral solution of flat plate flow with heat transfer; dimensional analysis for free and forced convection; shear stress drag and the Reynolds Colburn analogy; theories of turbulence; the effect of turbulence on drag and heat transfer.
Prerequisite ME4312

ME4418 Thermofluids Design (Autumn/4)

4 hours per week; 13 weeks/7th semester; 26L/26LAB; ECTS credits:6

Selection of CAD softwares, design analysis of industrial piping and pumping system design using analytical and cae approach, network analysis of fluid process system design, cfd codes including turbulence modelling, experimental analysis applied to simple fluid system modelling and applications. *Prerequisit : ME 4562*

ME4427 Medical Device Design And Placement (Autumn/4)

Overview of medical engineering materials and their functional properties. Practical aspects of stress analysis and biomechanic in medical appliances and devices. Stability of design elements. Aspects of component life, cost and reliability. Review of the history of medical design device, Fatigue behaviour of medical devices. Wear and strength of medical devices. Mechanical testing of medical devices. Use of fatigue data, load and environment factors in design and selection. Use of standards. Bio-materials and life considerations. Corrosion protection. Safety and the work environment. Testing and certification. Medical device legislation and regulation. Clinical use of devices and design constraints. Case studies in design from Medical Device Industry. *Prerequisite Suitable only for 4th year Mech. Eng. (Biomedical Eng.)*

ME4517   Energy Management (Autumn/4)

4 hours per week; 13 weeks/7th semester; 26L/26LAB; credit:6

Fossil fuel reserves and rates of consumption; energy situation in Ireland, trends and issues, present and future; energy and the environment; energy tariffs and their significance in industry; economics of energy - payback period, present value, analysis, energy audit; energy management systems; combined hear and power; renewable energy sources; optimising thermal equipment; Lagrange multiplies; modelling thermal equipment; hear exchanger effectiveness and number of transfer units; availability, energy and minimisation of entropy production.
Prerequisite ME4526

ME4523 Thermodynamics (Autumn/2)

First law of Thermodynamics with applications to non-flow and to steady flow processes.
General Thermodynamic relationships and properties. Statements of the Second Law of Thermodynamics including Carnot efficiency. Corollaries of the Second Law of Thermodynamics including the Clausius inequality and concepts of irreversibility. Otto, Diesel and Dual reciprocating engine cycles. Joule cycle with applications to simple gas turbine engines.

ME4527   Thermodynamics 3 (Autumn/4)

4 hours per week; 13 weeks/7th semester; 26L/26LAB; ECTS credits:6

The second law re-visited; alternative approaches to entropy; the flow through gas turbine blade rows; the non-dimensionalised equations; compressible analysis; three dimensional flows; a design example; combustion; first law analysis of combustion.
Prerequisite ME4414

ME4528 Propulsion Systems (Autumn/4)

4 hours per week; 13 weeks/7th semester; 26L/26LAB; ECTS credits:6

The jet propulsion principle and the thrust equation; turbojets, turboprops and turbofans; ramjets and unducted fans; reviews of mechanics and thermodynamics of fluid flow; one-dimensional gas dynamics and boundary layer theory; thermodynamics of aircraft jet engines: efficiency and performance; two-dimensional blade row velocity triangles for turbines and compressors; stresses in turbine discs. *Prerequisite: ME4424*

ME4611 Computing (Autumn/1)

4 hours per week; 13 weeks/1st semester; 26L/26LAB; ECTS credits:6

Introduction to computer organisation, programming languages, top-down design techniques; arithmetic operations including intrinsic functions; control structures;

data files and input/output system; single and multidimensional array processing; implementing top-down design with functions and subroutines; character, complex, and double-precision data; internal, sequential and direct access files; numerical applications; and engineering applications. Operating System (DOS) and use of spreadsheets.

ME4717   Control Engineering 2 * (Autumn/4)

4 hours per week; 13 weeks/7th semester; 26L/26LAB; ECTS credits:6

Lap lace transforms dynamic behaviour closed loop control system; controller design using frequency response criteria stability of closed loop control systems frequency response analysis development of empirical dynamic models from step response data.
Prerequisite ME4714

ME4727 Stability and Control (Autumn/4)

4 hours per week; 13 weeks/7th semester; 26L/26LAB; ECTS credits:6

Equations of motion for a rigid body aircraft; physical basis for longitudinal and lateral stability derivatives; solution of the equations for free longitudinal motions, phugoid and short period modes, flight paths, variation of roots with C.O.G. position, flying qualities; free lateral motion; basic control theory, transfer functions, block diagrams, state space to transfer function representations for MIMO systems, the root locus technique; open loop control - response to controls; closed loop control, autopilots with displacement and velocity feedback, stability augmentation systems with velocity feedback and full state feedback.

ME4813   Design 1 (Autumn/2)
4 hours per week; 13 weeks/3rd semester; 26L/26T; ECTS credits:6

Responsibilities of the designer (social, legal, environmental and technical); structured design methodology; design recording and presentation techniques; engineering communications.
Prerequisite ME4661

ME4817   Aircraft Systems Design (Autumn/4)

4 hours per week; 13 weeks/7th semester; 26L/26T; ECTS credits:6

System engineering of aircraft design; preliminary sizing of critical parameters to specified performance requirements and air worthiness regulations; conceptual aircraft layout and scaling to requirements; weight and balance prediction and assessment; determination of aerodynamics and stability parameters for preliminary design; structural layout of critical elements.
Prerequisite ME4826

ME4827   CAD 3-D (Autumn/4)

4 hours per week; 13 weeks/7th semester; 26L/26LAB; ECTS credits:6

The geometry of three-dimensional space; 3D wire frame, surface modelling and solid modelling; translation of models into other forms; e.g. FE meshes; rendering and presentation; mechanism modellers and visualisation modellers.

MF4111 Production Processes (Autumn/1)

4 hours per week; 13 weeks/1st semester; 26L/26LAB; ECTS credits:6

The aim of this module is to provide the student with a basic knowledge and experience of the methods employed in the processing and fabrication of common engineering materials and to emphasise the importance of safety in the engineering environment.

MF4713   Work Design and Measurement (Autumn/2)

4 hours per week; 13 weeks/3rd semester; 26L/26LAB; ECTS credits:6

The aim of this module is to provide expertise in the area of Work Design so that significant improvements in productivity can be achieved in manual and clerical work. To learn how to estimate the times required for jobs and to explain how to collect data on work times and methods.

MF4717 Modelling & Control of Dynamic Systems* (Autumn/4)

4 hours per week; 13 weeks/7th semester; 26L/26LAB; ECTS credits:6

To develop skills in analysing and modelling dynamic systems. To develop the students' ability to build and analyse models at the systems level. To introduce the concept of controlling dynamic systems and to view operations and manufacturing in an integrated fashion.
Prerequisite MF4766

MF4723   Organisational Psychology (Autumn/2)

4 hours per week; 13 weeks/3rd semester; 26L/26LAB; ECTS credits:6

To introduce students to working in organisations prior to their co-operative placement. To acquaint students with sufficient knowledge to understand structures and cultures of organisations. To enable students to understand managerial practice in order to accept and practice management.

MF4727   Operations Management 3 * (Autumn/4)

4 hours per week; 13 weeks/7th semester; 26L/26LAB; ECTS credits:6

The aim of this module is to draw together material from the prerequisite modules and apply them to understand and optimise the operation of manufacturing systems. The module will address the following issues; scheduling; production planning and inventory control; variability in manufacturing operations; and layout design. *Prerequisite MF4716*

MF4733   Manufacturing Information Systems* (Autumn/2)

4 hours per week; 13 weeks/3rd semester; 26L/26LAB; ECTS credits:6

To give students an understanding of the role of information within a manufacturing organisation. To introduce students to tools available for information systems analysis and design and to allow students to acquire data management skills. *Prerequisite: MF4712*

MF4737 Automation Engineering 2* (Autumn/4)

4 hours per week; 13 weeks/7th semester; 26L/26LAB; ECTS credits:6

To introduce the student to the analytical concepts of movement and stability in equipment design. To introduce the student to the programming languages in Computer Aided Manufacturing. *Prerequisite: MF4766*

MF4747 Material Forming 1* (Autumn/4)
4 hours per week; 13 weeks/7th semester; 26L/26LAB; ECTS credits:6

To introduce the student to the analytical aspects and the different theories used in establishing the deformation forces in the shaping of engineering materials. *Prerequisite: MF4746*

MT4003 / MT4013 Polymer Science (Autumn/2)
4 hours per week; 13 weeks/3rd semester; 26L/26LAB; ECTS credits:6

Molar mass averages; polymer chemistry, addition and condensation, chain growth and step growth mechanisms, kinetics and chain statistics; branching and cross linking; copolymerisation; polymerisation techniques; chain structure and property relationships; crystallinity; polymer solutions.

MT4017 Biomaterials 1 (Autumn/4)

Introduction to Biomaterials, Definitions, Cell structure and function. Cell regulation, Homeostasis. Biological Macromolecules, Protein Structure, Amino Acids, Primary, Secondary and Tertiary Structure. Immunology, Autografts, Allografts and Xenografts. Blood Clotting Mechanisms. Biocompatibility, Classification of Devices and Materials, Bioactive, Bioinert, Bioresorpable, Hybrid Biomaterials, Tissue Engineering, Haemocompatibility. Assessment of Biocompatibility, Cell Culture Assessment, Implantology. Medical Devices Directive, ISO and EN standards, Testing Protocols and strategies. Risk Assessment. *Prerequisite CH4701, MT4943*

MT4101 Introduction to Materials (Autumn/1)

5 hours per week; 13 weeks/1st semester; 26L/13T/26LAB; ECTS credits:6

Historical background to development of materials; materials science; classes of modern materials; metals; polymers; ceramics and glasses; composites; origin of these materials; properties; applications; related to properties.

MT4103 Materials Science 2 (Autumn/2)

5 hours per week; 13 weeks/3rd semester; 26L/13T/26LAB; ECTS credits:6

Mechanical; metallurgical fundamentals; tensile testing; ductile; brittle failure; fatigue; creep; impact testing ; torsion testing; harness testing.

MT4105 Quality Systems (Autumn/3)

4 hours per week; 13 weeks/5th semester; 26L/26LAB; ECTS credits:6

To form an understanding of the concepts behind the ISO 9000 standards, product testing and certification. How quality standards operate in Irish manufacturing and service industries. How the standards relate to Total Quality Management (TQM). How to document and maintain a Quality System. How to quantify the cost of quality within companies. To develop an understanding of the basic tools of statistical process control. To understand the role of Total Quality Management (TQM) in improving business performance.

MT4107 Composite Materials   (Autumn/4)

4 hours per week; 13 weeks/7th semester; 26L/26LAB; ECTS credits:6

Fundamental concepts of composite materials; ceramic, metal and polymer matrix systems; stiffness and strength of composites, with particular reference to continuous fibre materials; macro mechanical and micro mechanical approaches; lamina and laminates; processing techniques; typical applications.

MT4205 Failure Processes (including FM) (Autumn/3)

5 hours per week; 13 weeks/5th semester; 26L/13T/26LAB; ECTS credits:6

Fracture; linear elastic fracture mechanics; fatigue - life prediction; stress corrosion cracking; corrosion mechanisms; protection processes; creep mechanisms.

MT4207   Failure and Damage Analysis (Autumn/4)

5 hours per week; 13 weeks/7th semester; 26L/13T/26LAB; ECTS credits:6

Analysis of failure and damage; modes of failure; procedures of failure analysis; implications of failure analysis; experimentally based mini-projects; case studies.

MT4217   Optical Fibre (Autumn/4)

3 hours per week; 13 weeks/7th semester; 26L/13LAB; ECTS credits:6

Optical fibres: fibre fabricatio , imperfections, fibre strength and durability, measurement of mechanical characteristics, cleaning of fibres, fibre jointing, novel fibre types; optical fibre devices; tapering and polishing for field access, tapered and polished couplers, beam expanders, mode shapers, light concentrators, evanescent field devices, stability and long term reliability; optical fibre sensors; process control, medical diagnostics, monitoring electric, gas and nuclear utilities, industrial automation and robotics.

MT4303   Materials Science 3   (Autumn/2)

6 hours per week; 13 weeks/3rd semester; 26L/13T/26LAB; ECTS credits:6

Crystal chemistry of metallic and non-metallic structures; ionic and covalent crystals; structure; unit cells; indices; planes and directions; symmetry; crystal classes; stereographic projection; crystal defects; Frenkel and Scrottky; non-stoichiometry in compounds; diffusion; atomic mechanisms; X-ray diffraction; Bragg and Laue equations; powder photographs; diffract meter; diffraction patterns; structure determination.
Prerequisite MT 4102

MT4305   Advanced Analytical Techniques* (Autumn/3)

5 hours per week; 13 weeks/5th semester; 26L/13T/26LAB; ECTS credits:6

Diffraction techniques, electron diffraction analysis of simple diffraction pattern; electron microscopy; scanning electron microscopy, EPMA, surface analysis atomic force microscopy; spectroscopic techniques; IR visible and UV;

nuclear magnetic resonance; thermal analysis techniques; case studies involving; specific materials problems.
Prerequisite MT4913

MT4707 High Performance Materials (Autumn/4)

5 hours per week; 13 weeks/7th semester; 26L/13T/26LAB; ECTS credits:6

High temperature systems; materials for gas turbines; advanced processing; oxidation; corrosion resistance; coatings; high performance aluminium alloys; titanium alloys; processing - structure - property relationships.

MT4717 Aerospace Materials (Autumn/4)

4 hours per week; 13 weeks/7th semester; 26L/26LAB; ECTS credits:6

Properties and processing of metallic and non-metallic, monolithic and composite, structural and high temperature materials for aerospace applications

MT4805 Ceramics & Glass Science 2 (Autumn/3)

5 hours per week; 13 weeks/5th semester; 26L/13T/26LAB; ECTS credits:6

Microstructure and texture in ceramics; structure/property relationships in ceramics; fracture in brittle materials; criteria for high strength; approaches to processing: (1) flaw-minimal fabrication (2) micro structural engineering; silicon nitride; zirconium; transformation toughening; plastic deformation in ceramics; creep strength of glass; diversification of glasses; nucleation and crystal growth; glass-ceramic systems and properties; optical properties.
Prerequisite MT 4804

MT4903 Engineering Materials 2 * (Autumn/2)

5 hours per week; 13 weeks/3rd semester; 26L/13T/26LAB; ECTS credits:6

Annealing; the TTT diagram and the heat treatment of steel; harden ability; precipitation hardening in metallic systems; structural materials; major mechanical properties of ferrous and non ferrous alloys; ceramics and glasses; thermosetting, and thermoplastic polymers and the properties of commercially important types; effect of environment on material performance.
Prerequisite MT 4922

MT4905 Materials Technology 3 (Autumn/3)

4 hours per week; 13 weeks/5th semester; 26L/26LAB; ECTS credits:6

Principles of polymer processing; extrusion; injection; materials, techniques; compression, transfer and rotation, die filling, cycle, process control, effect on properties; blow moulding and vacuum forming mounding; cellular polymers.

MT4907 Polymer Chemistry (Autumn/4)

4 hours per week; 13 weeks/7th semester; 26L/26LAB; ECTS credits:6

Ring opening polymerisations, their kinetics and reaction mechanisms; chemistry of selected natural polymers; cellulose and its derivatives, polyisoprene and proteins; degradation reactions, thermal, chemical and radiation induced processes, their mechanism and kinetic descriptions.

MT4923   Materials Technology 2 (Autumn/2)

4 hours per week; 13 weeks/3rd semester; 26L/26LAB; ECTS credits:6

Mechanical fundamentals of materials; metallurgical fundamentals of materials; irons and steels; heat treatment; copper, aluminium, nickel; mechanical testing and theory.

MT4943   Materials processing (Autumn/2)

4 hours per week; 13 weeks/3rd semester; 26L/26LAB; ECTS credits:6
Metals; casting; forming; extrusion, forging, rolling, sheet metal work; joining; mechanical, welding, adhesion, brazing; polymers; processing techniques.

PD4006 Product Prototyping and Development (Autumn/3)

4 hours per week; 13 weeks/5th semester;13L/26T/13LAB; ECTS credits:6

Models and prototypes in design processes. Right-first-time strategies. Building pre-models, models for aesthetic and tactile feedback. Cross fertilisation between ideas, computer models, models and prototypes. Designing and building test-rigs. Rapid-prototyping techniques,. Prototype examples and evaluation. Evaluation matrices. Prototype - procedures and processes. Studio/workshop assignments.

PD4013 Aesthetics Foundation and Form (Autumn/2)

4 hours per week; 13 weeks/3rd semester;13L/26T/13LAB; ECTS credits:6

Appreciate the meaning and impact of aesthetic issues and considerations. Consider cultural, economic and social issues in
ergonomic examples and evaluations
Apply aesthetic criteria in form creation and other elements of design
Evaluate the aesthetic quality of products
Be aware of contemporary trends in aesthetics
Attractiveness of forms, colours, textures etc.; emotional and cultural aspects of appearance; historical development of design; economic and social history; awareness of the product form, applications of these in form creation and product design. Contemporary trends in aesthetics.

PD4016 Aesthetics – Appearance and Execution (Autumn/3)

4 hours per week; 13 weeks/5th semester;13L/26T/13LAB; ECTS credits:6

Apply aesthetic values to product unity and co-ordination. Consider the application of aesthetics in the context of emotional and cultural aspects of design. Critically analyse design proposals in relation to spatial insight, imaging and form. Execute design briefs and design tasks showing aesthetic insight.
Developing forms, manipulating colour, product unity and co-ordination, application of emotional and cultural aspects of product forms to product design. Theories affecting spatial insights and images, image forming and analysis, presentation of image forming results, development of form concepts, Student execution in design tasks.

PD4023 Design Research and Specifications (Autmn/2)

4 hours per week; 13 weeks/3rd semester;13L/26T/13LAB; ECTS credits:6

Evaluation of design - function, manufacturability and aesthetics. Evaluate total design processes. Design products to meet specific requirements. Be able to write a design brief. Incorporate systems technologies in design solutions. Be able to write up design standards and specifications. Appreciate responsibility of designing. Background research in designing - environmental, manufacturing cost (and other aspects), constraints, research and analysis. Incorporation of all factors impacting on the product, into a thorough and sustainable product specification, to satisfy appropriate Standards, to include research methods planning and costing etc. Inclusive design considerations and legislation.
Prerequisite: ID4812

PD4024 Design for Environmental Sustainability (Atumn/3)

4 hours per week; 13 weeks/5th semester;13L/26T/13LAB; ECTS credits:6

Familiarise students with issues relating to energy consumption, resource depletion and waste generation and management, as well as obsolescence, 'disposables', and over-consumption. Equip students with appropriate environmental assessment and analysis tools and with the ability to critically appraise contemporary trends and practices in design and engineering. Equip students with abilities to perform environmental evaluations on products (life cycle analysis – LCA) and processes. Outline relevant legislative requirements relating to environmental aspects of products and processes. Provide an understanding of how sustainable design considerations and strategies must be inherent at the concept design stages of a product as well as throughout its life cycle.

PD4036 Design Realisation – Concept to Product (Autumn/3)

4 hours per week; 13 weeks/5th semester; 52LAB; ECTS credits:6

Understand the psychology and cultural issues of design. Understand environmental impact of design. Have an appreciation of design trends in a variety of cultures. Appreciate the legal aspects of design. Understand the business of design. Reflect an understanding of current issues in the realization of design briefs.
Optimal selection of components, materials, processes and assembly methods. Evaluation of reliability and usability with a view to a cost effective solution within the constraints of the design specification. Current issues in designing, Case studies. Student task assignments.

PE4317   Automation Technology 2+ (Autumn/4)

4 hours per week; 13 weeks/7th semester; 26L/26LAB; ECTS credit:6

Classification of CNC machines, CNC machining; programming languages, manual and computer part programming; ISO programming codes, post-processor programmes, the 'Smart-cam' and CAD-key languages; DNC and interactive control of machines; the machine control unit, pulse generation and counting, table speed and position sensors, encoders and tachometers; table drives, amplifiers, D.C. motors, stepping and brush less servo drives; variable speed spindle drives; machine vision, object detection, bar-code readers; robot types, robot analysis and control, end effectors, programming languages, artificial intelligence; the flexible manufacturing cell, cell integration, data communications, transmission technology, local area networking, distributed systems, network serves. *Prerequisite PE4316*

PN4015 Design & Technology 2 (Autumn/3)

5 hours per week; 13 weeks/5th semester; 13L/52LAB; ECTS credit:6

Analysis of technology syllabuses and the structuring and planning of lessons to achieve quality outcomes. Quality of learning and the effective translation of knowledge and understanding of design and technology into practice. Strategies for development of design capabilities in 2nd level pupils to enable them to become confident in applying technological solutions to real problems. Promoting independent learning and facilitating the development of an enquiring mind.

PN4111 Introduction to Material Processing (Autumn/1)

5 hours per week; 13 weeks/1st semester; 13L/52LAB; ECTS credits:6

Safety; manufacturing systems; historical perspectives on Manufacturing; production of materials; properties of materials which influence their selection; environmental implications of material processing; machine tools; basic manufacturing processes; expendable-mould casting; engineering measurement; standards of measurement; measuring instruments; introduction to metal cutting; chip formation; coolants; cutting speeds and feed rates; hand processing of materials.

PN4113 Process Technology 2* (Autumn/2)

6 hours per week; 13 weeks/3rd semester; 26L/52LAB; ECTS credits:6

Milling of components using the dividing head; milling with special form cutters; more advanced bench work and hand working processes; decorative metalwork involving repousse; rubber moulding techniques, resin casting, glass reinforced plastic lay-up.

PN4115 Process Technology 3 (Autumn/3)

4 hours per week; 13 weeks/5th semester; 52LAB; ECTS credits:6

Problem identification in Engineering and Technology; evaluation of design; interpretation of design briefs; pedagogical considerations; design strategies and processes of designing relating to L.C. project briefs; manufacturing systems; design for manufacture; modelling and prototyping design solutions; properties of materials, selection of materials, shaping, joining and machining materials, finishing and presentation of artefacts; designing and making Leaving Certificate Engineering Technology and Technology design projects; evaluation and assessment criteria for design and make projects; management of the design and make environment.

PN4213 Technical Graphics (Autumn/2)

5 hours per week; 13 weeks/3rd semester; 13L/52LAB; ECTS credits:6

Learning stragegies in graphical problem-solving; orthographic projection; axonometric projection; planes and their traces and angles; freehand sketching in communication and in the modelling and development of ideas and designs; plane geometries; transformation geometry; two-dimensional and three-dimensional graphic design; surface developments and package design; presentation techniques; modelling solutions; surfaces in

contact; auxiliary projections; assessment modes and techniques. *Prerequisite PT4111*

PN4215 Technical Graphics & CAD* (Autumn/3)

5 hours per week; 13 weeks/5th semester; 13L/52LAB; ECTS credits:6

Oblique and tangent planes - determination of traces, true shapes and angles; intersection and development of surfaces - plane and curved; conic sections - unique and common properties; pictorial solutions to assist visualisation; cognitive modelling strategies; geometric proofs in plane geometry; Axonometric planes; non-Euclidean geometries; hardware, software and operating systems; the AutoCAD drawing environment; basic drawing commands and editing fundamentals using blocks, attributes and symbols libraries; communicating building/ engineering and design details; dimensioning fundamentals; sections and hatching techniques; dictionaries and files; isometric drawing techniques; advanced drawing and program features. *Prerequisite PN4213*

PT4111 Manufacturing Technology 1 (Autumn/1)

4 hours per week; 13 weeks/3rd semester; 26L/26Lab; ECTS credits:6

Safety; manufacturing systems; historical perspectives on Manufacturing; production of materials; properties of materials which influence their selection; environmental implications of material processing; machine tools; basic manufacturing processes; expendable-mould casting; engineering measurement; standards of measurement; measuring instruments; introduction to metal cutting; chip formation; coolants; cutting speeds and feed rates; hand processing of materials.

PT4113   Measurement & Inspection*   (Autumn2)

4 hours per week; 13 weeks/3rd semester; 26L/26Lab; ECTS credits:6

Historical background to measurement and interchange ability of parts limits and fits BS4500; measuring instruments; errors in measurement; measurement of components; straightness testing; machine tool alignment; flatness testing; measurement of surface texture; limit gauge design, in process measurement, automated measurement systems.
Prerequisite PT4112

PT4115 Manufacturing Technology 4* (Autumn/3)

4 hours per week; 13 weeks/5th semester; 26L/26Lab; ECTS credits:6

The stress strain diagram, the plastic region; metallurgical aspects of hot and cold working; work done in the deformation of metals; the mechanics of metal cutting; merchants analysis of metal cutting; lubrication and cutting fluids.
Prerequisite PT4112

PT4117   Manufacturing Technology 5 (Autumn/4)

4 hours per week; 13 weeks/7th semester; 26L/26LAB; ECTS credits:6

Mechanics of machine tools; forces on machine elements; machine tool alignment; machining of geometric forms; the machine-control unit for N.C. and CNC system; times for machining processes; cutting times; economic comparison of alternative processes, 'break-even' quantities; ISO standards for tools and tool holders.
Prerequisite PT4115

PT4121 Communication Graphics (Autumn.1)

4 hours per week; 13 weeks/1st semester; 13L/39LAB; ECTS credits:6

To prompt and nurture spatial-visualisation and spatial-reasoning abilities critical to the success of technology professionals. To present the standards and conventions of engineering drawing essential to the correct creation and interpretation of graphical representation used in engineering communication and documentation. To foster manual drawing skills, especially sketching, which are essential to design and communication success.

PT 4315 Productivity Methods 3* (Autumn/3)

4 hours per week; 13 weeks/5th semester; 26L/26T; ECTS credits:6

The objective of a manufacturing organisation; functions and types of manufacture; jobbing batch mass and flow production; costs and break-even charts; facilities layout; Gantt charts, network charts, critical path, uncertain times, time-cost tradeoffs; production planning; scheduling by SPT; Johnson's and Jackson's rules; index and graphical methods; use of priority rules.

PT4317   Production Methods 4* (Autumn/4)

4 hours per week; 13 weeks/7th semester; 26L/26T; ECTS credits:6

Forecasting by means of moving averages, exponential weighting, regression and smoothing techniques; linear programming; assembly line balancing problems; simple lines; evaluation of alternative methods; mixed-model and multi-model designs; manual flow systems.
Prerequisite PT4315

PT4323   Productivity Methods 1A (Autumn/2)

4 hours per week; 13 weeks/3rd semester; 26L/26LAB; ECTS credits:6

Productivity, work design, workplace design, work measurement, time estimating, specialist techniques.

PT4423   2D CAD (Autumn/2)

4 hours per week; 13 weeks/3rd semester; 26L/26LAB; ECTS credits:6

Contemporary CAD software with particular reference to AutoCAD; hardware, software and operating systems; the AutoCAD drawing environment; absolute and relative coordinates, units and limits, CAD tools and drawing setup; the UCS; basic and advanced drawing and editing commands; introduction to layers; using blocks, attributes and symbol libraries; communicating engineering and design details; dimensioning and dimensioning styles; tolerance dimensioning; sectional views and hatching; text; introduction to Paper Space; basic customisation techniques; isometric drawing, CAD construction techniques, plotting; using Auto LISP routines from the Internet. DWF drawings; introduction to #D functions.

PT4427 Design for Manufacture (Autumn/4)

4 hours per week; 13 weeks/7th semester; 26L/26LAB; ECTS credits:6

New Product Development (NPD) versus traditional product development models. Cost of product development and cost of failure. Rationale for concurrent engineering. Product specification methods including Quality Function Deployment (QFD). Focus Groups, Voice of Customer (VOC) and functional analysis. Concept generation and evaluation using brainstorming, creativity methods Pugh's concept selector, and ranking methods to evaluate concepts. Design for manufacturing and assembly and the cost of complexity and variation. The function of patents, copyright and legal aspects of product liability and legal requirements including CE mark and environmental protection in product development.

PT4515   Automation T1* (Autumn/3)

4 hours per week; 13 weeks/5th semester; 26L/26LAB; ECTS credits:6

Programmable logic controllers; interfacing and programming; sensing devices; Analog - Digital; low cost automation; pneumatic control pneumatic circuit design; hydraulic circuit design; hoppers; feeders; orienting mechanisms; indexing mechanisms; transfer mechanisms; conveyors; the appellation of pneumatic, hydraulic; mechanical systems to manufacturing.

PT4517   Automation T 2 (Autumn/4)

4 hours per week; 13 weeks/7th semester; 26L/26LAB; ECTS credits:6

Comparisons of hard/ programmable and manual status; costing of systems; systems specifications; design specifications; contracts; user manuals; safety etc.; robotics; production flow analysis; networks communication theory. *Prerequisite PT4515*

PT4617   Reliability Technology (Autumn/4)

4 hours per week; 13 weeks/7th semester; 26L/26T; ECTS credits:6

Considerations of implications on costs of purchase, operation and maintenance; reliability estimation; prediction of repair times; acceptance testing for reliability; replacement decision-making.

WT4101 Wood Technology and Processes (Autumn/1)

4 hours per week; 13 weeks/1st semester; 26L/26LAB; ECTS credits:6

Laboratory, health and safety; hand tools and equipment; wood as a material; wood based-materials; world timber resource; basic machine processes; introduction to engineering materials and processes.

WT4105   Wood Science 3*   (Autumn/3)

4 hours per hours; 13 weeks/5th semester; 26L/26Lab; ECTS credits:6

Mechanical properties of wood; specific gravity, density, concept of cellular solids; tensile strength; compressive strength; hardness and abrasion resistance; wood composites.

WT4107 Pulp, Fibre and Board Manufacture 1 (Autumn/4)

4 hours per hours; 13 weeks/7th semester; 26L/26Lab; ECTS credits:6

Concepts in modifying wood; deconstruction, combination, chemical and physical changes; comminution; fibres, pulping, mechanical, chemical, physical, chips, particles, veneer, sections; fibre products; manufacture, types, properties, end uses.

WT4203 Furniture Design*   (Autumn/2)

3 hours per week; 13 weeks/3rd semester; 39L; ECTS credits:6

A general appreciation of man's progressive development through the ages by reference to his design achievements; furniture design in a historical context as a precursor to contemporary design; seminars/projects: analysis and response to given design briefs.; problem definition; solution options; design modelling and presentation.

WT4213 Technical Graphics (Autumn/2)

5 hours per week; 13 weeks/3rd semester; 13L/52LAB; ECTS credits:6

Learning stragegies in graphical problem-solving; orthographic projection; axonometric projection; planes and their traces and angles; freehand sketching in communication and in the modelling and development of ideas and designs; plane geometries; transformation geometry; two-dimensional and three-dimensional graphic design; surface developments and package design; presentation techniques; modelling solutions; surfaces in contact; auxiliary projections; assessment modes and techniques. *Prerequisite WT4303*

WT4303 Machining Technology 1 (Autumn/2)

4 hours per week; 13 weeks/3rd semester; 26L/26LAB; ECTS credits:6

Health and safety; introduction to standard machines for cutting, shaping and joint formation; factors governing selection and use relative to material and profile; analysis of factors governing machine shop layout, practical applications.

WT4305   Machining Technology 3* (Autumn/3)

4 hours per week; 13 weeks/5th semester; 26L/26LAB; ECTS credits:6

Advanced machine processes; computer integrated manufacturing; analysis of tool design; material optimisation; analysis of factors governing the economics of manufacturing complex product design including effective modification of design and/or equipment; case studies.
Prerequisite WT 4304

WT4315   Harvesting and Sawmill Technology* (Autumn/3)

4 hours per week; 13 weeks/5th semester; 26L/26LAB; ECTS credits:6

Extraction, transportation and sorting logs, main equipment/machines - selection relative to location and end use; analysis of material optimisation; sawmill layout; computer control systems; sawmill wastes; grading and drying; quality control; storage and yard organisation; structured visits to forests and sawmills.
Prerequisite WT 4102

WT4401 Construction Technology and Management 1 (Autumn/1)

4 hours per week; 13 weeks/1st semester;26L/26Lab; ECTS credits: 6

Basic elements of substructure (site works, setting out and foundations); superstructure elements (flooring, roofs, simple finishes, fittings and fixtures);basic services (water, gas, electricity, drainage); techniques for low-rise framed industrial and commercial building. Intro to site works, temporary works, sub-structure construction, foundations, retaining walls and basements, superstructure techniques, stonework, brickwork, arches; timber-framed construction; floors, walls, roofs, internal fixtures and fitting; thermal and sound insulaton; framed buildings, structursl steel, reinforced concrete, pre-cast concrete, cladding systems; intro do building services, domestic water supply, sanitary fittings, pipework, drainage.

WT4403 Process Technology 2 (Wood) (Autumn/2)

4 hours per week; 13 weeks/3rd semester; 26L/26LAB; ECTS credits:6

Machines and machining practice; safety measures and regulations; jig and template design; on-going maintenance C.N.C. programming and applications; wood processing; setting-out procedure; work sequencing; joint design and applications for solid and composite board material; wood turning.

WT4404   Wood Technology 1* (Autumn/2)

4 hours per week; 13 weeks/4th Semester; 26L/26LAB; ECTS credits:6

Evolution of design in wood; materials selection, detailing and finishes to satisfy structural, functional and environmental criteria; applications - primary, secondary and temporary elements of buildings, finishes of interiors; project design and analysis.
Prerequisite WT 4303

WT4405   Wood Technology 2* (Autumn/3)

4 hours per week; 13 weeks/5th semester; 26L/26LAB; ECTS credits:6

Analysis of factors governing the weathering of wood based materials - chemical, colour and physical changes; preservatives - analysis of factors governing their .selection and application; surface finishing - analysis of factors governing selection and application of the finishing agent.
Prerequisite WT 4404

WT4503 Structural Mechanics* (Autumn/2)

4 hours per week; 13 weeks/3rd semester; 26L/26LAB; ECTS credits:6

Statics and dynamics; systems of units, forces, frameworks stress and strain, friction, velocity, motion, work, energy, power.; moments of area; loading, factor of safety/load factor; design of ties struts and beams; indeterminacy, elasticity and
plasticity, influence lines, space frames, arches, slabs cables and membranes.

WT4905 Building Construction (Autumn/3)

1 hour per week; 13 weeks/5th semester; 13L; ECTS credits:6

History of Building; design processes - the relationship of constructional forms, spatial and user requirements, comfort and climatic conditions Design Discipline;

communication of design; design and construction of small scale/low rise buildings; materials, selection, performance function of components and assemblies.

WT4915 Building Services 1 (Autumn/3)

3 hours per week; 13 weeks/5th semester; 39L; ECTS credits:6

User requirements, comfort and climatic conditions; statutory regulations; cold water sources; cold water installation; domestic hot water systems; electrical generation, transmission and distribution; ventilation; natural daylighting of buildings; laboratory practices.

Science Modules

BC4401 Introduction to Industrial Biochemistry (Autumn/1)

3 hours per week; 13 weeks/1st semester; 26L/13T; ECTS credits:6

Genetic information and Genetic Engineering; overview of approaches and applications. DNA fingerprinting; applications of fingerprinting to forensic science, edigree analysis and paternity testing. The Human Genome Project and its impact on society; the cloning of mammals and mammalian body parts. Human cloning. The Biochemistry of HIV; viral structure and biology. Biotechnical approaches to developing a cure/vaccine. Prion biology; BSE and CJD. Dangerous microbes; concept of mobile DNA. Molecular biology of cancer; oncogenes and cellular transformation. Biotech strategies to cure cancer. The approach to research; case studies; identification of a problem, planning and pursuing a research strategy. Evaluating the results. Pharmaceutical biology and biotechnology; approaches to drug discovery; the discovery of aspirin, antibiotics and taxol. Products of pharmaceutical biotechnology and their medical uses. Gene medicines; gene therapy. Life at the extremes; the unique biology of hyperthermophiles. Biological warfare.

BC4405 BioProcess Technology 1 (Autumn/3)

6 hours per week; 13 weeks/5th semester; 26L/13T/39LAB; ECTS credits:6

Fluid mechanics; momentum transfer; the Bernoilli equation; flow in pipes and vessels; dimensional analysis; principles of heat and mass transfer; heat transfer coefficients; heat exchangers; structure and use of design equations for biochemical reactor systems; bulk mass transfer effects; quantitative treatment of large scale sterilisation. *Prerequisite CH4404*

BC4705 Industrial Biochemistry 1 (Autumn/3)

4 hours per week; 13 weeks/5th semester; 26L/26T; ECTS credits:6

Plant cell biotechnology; plant cell structure and lignocellulose; extraction of plant cell products; algal biotechnology; bioaffinity purification; industrial uses of enzymes; enzyme stabilisation; yeast technology and brewing science. *Prerequisites BC4915 & BC4904*

BC4803 Microbial Technology 1 (Autumn/1)

7 hours per week; 13 weeks/3rd semester; 26L/26T/39LAB; ECTS credits:6

The prokaryotic and eukaryotic micro-organism; systematics in microbiology; industrial micro-organisms; mycology; processes mediated by fungi; industrial mycology; introduction to viruses; microbial ecology; GEMs' control of microbial activity. *Prerequisite BY4001*

BC4805 Microbial Technology 2 (Autumn/3)

7 hours per week; 13 weeks/5th semester; 26L/26T/39LAB; ECTS credits:6

Growth of micro organisms; principles of fermentation technology; animal and plant cell tissue culture; food microbiology; food infections and poisoning; microbial toxins; pathogenic micro organisms; immunology**.** *Prerequisites BC4803, &BY4001*

BC4903 Biochemistry 1(Biomolecules) (Autumn/1)

7 hours per week; 13 weeks/3rd semester; 26L/26T/39LAB; ECTS credits:6

The foundations of biochemistry and the molecular logic of life; biomolecules: proteins, carbohydrates, lipids, nucleic acids, vitamins; bioenergetics and metabolism.

BC4905 Biochemistry 4 (Genetic Engineering) (Autumn/3)

6 hours per week; 13 weeks/5th semester; 26L/13T/39LAB; ECTS credits:6

Gene structure , function and control; techniques to manipulate DNA; DNA transfer methods; polymerase chain reaction; cDNA; northern ,southern and western blotting; cloning in plants and animals; introduction to bioinformatics; gene therapy. *Prerequisites BC4903/BC4904*

BC4907 Biochemistry 6 (Cell Biochemistry) (Autumn/4)

7 hours per week; 13 weeks/7th semester; 26L/26T/39LAB; ECTS credits:6

Receptor biochemistry- mode of hormone action]; protein folding, protein targeting via glycosylation; protein engineering; cell communication neural transmission; biochemistry of vision; the biology of cancer; oncogenes. *Prerequisites BC4903 & BC4904*

BC4915 Biochemistry 5 (Metabolism) (Autumn/3)

7 hours per week; 13 weeks/5th semester; 26L/26T/39LAB; ECTS credits:6

Biological energetics; control of metabolic pathways; carbohydrate metabolism; cellulose; Lignin and Humicellulose; lipid metabolism; membranes and membrane transport; amino acid metabolism; role of amino acids in nucleotide synthesis; natural products; biodeterioration and its global potential; errors in metabolism; use of metabolic pathways as a diagnostic tool; developing new metabolic pathways; enzyme immobilisation.

BC4937 Biopharmaceuticals (Autumn/4)

7 hours per week; 13 weeks/7th semester; 26L/26T/39LAB; ECTS credits:6

Overview of the pharmaceutical industry; the pharmaceutical facility; sources an production of pharmaceuticals; blood products and related substances; hormones; regulatory factors and enzymes; gene therapy and anti-sense technology. *Prerequisites BC4903/BC4915*

BC4947 Immunology (Autumn/4)

4 hours per week; 13 weeks/7th semester; 26L/26T; ECTS credits:6

Overview of the immune system; cellular and humoral responses; regulation; passive vs active immunity; compliment; T cell structure and differentiation; antibody structure and function; immunology of AIDS, prion diseases; tumour immunology ; molecular immunology. *Prerequisites BC4903/ BC4904*

BC4957 Bioinformatics in Genetic and Protein Analysis (Autumn/4

3 hours per week; 13 weeks/7th semester; 26L/13T; ECTS credits:6

DNA sequence data; gene structure in eukaryotes archaebacteria and prokaryote; genome projects; techniques and methodologies; gene functionality; accessing bioinformatics databases; searching databases; analysis of protein sequences; protein modelling; phylogenetic analysis. *Prerequisite Biochemistry 2/4,BC4904,BC4905*

BY4001   Biology 1   (Autumn/1)

4 hours per week; 13 weeks/1st semester; 26L/26LAB; ECTS credits:6

Introduction to biology; characteristics of life, scientific methodology; cell structure and function: membrane structure and function; chemistry of the cell and organism; biomolecules; animal physiology; respiratory, circulatory, digestive, reproductive and nervous system: mammalian hormones, sense organs, musculo skeletal system; introduction to micro-organisms; prokaryotic and eucaryotic organisms.

BY4003 Biology 3*   (Autumn/2)

4 hours per week; 13 weeks/3rd semester; 26L/26LAB; ECTS credits:6

Invertebrate phyla: Protozoa, Porifera, cnidaria, Platyhelminthes, annelida, Arthropods, mullusca, Echinodermata; examination of representative examples from the following groups: algae, fungi, bryophyta, pteridophyta, coniferphyta, anthophyta.

BY4005   Vertebrate Structure and Function* (Autumn/3)

4 hours per week; 13 weeks/5th semester; 26L/26LAB; ECTS credits:6

Definition of the phylum chordata; major groups of chordates; evolutionary trends within the phylum; homeostasis and control in mammalian body systems; introduction to animal behaviour.

BY4011   General Biology   (Autumn/1)

4 hours per week; 13 weeks/1st semester; 26L/26LAB; ECTS credits:6

Introduction to biology; characteristics of life, scientific methodology; cell structure and function: membrane structure and function; chemistry of the cell and organism; biomolecules; Evolutionary theories; introduction to taxonomy; principles and scope of ecology; ecosystems; cycles in nature; energy flows; population and community dynamics; limiting factors; food chains; succession, environmental concerns; introduction to micro-organisms; procaryotic and eucaryotic organisms.

BY4013   General Microbiology (Autumn/2)

4 hours per week; 13 weeks/3rd semester; 26L/26LAB; ECTS credits:6

Microbial structure and function: microbial growth; nutrition; identification and enumeration; introductory systematics; bacterial endospore; applied aspects of microbiology and microbial ecology: microbiology of water; medical microbiology: disease and pathogenesis; food microbiology; preservation and spoilage; microbiology of soil biochemical cycles; biodegration;

some traditional and novel processes in industrial microbiology; microbes and biotechnology. Prerequisite BY4001

BY4125 Ecology 3* (Autumn/3)

4 hours per week; 13 weeks/5th semester; 26L/26LAB; ECTS credits:6

Characteristics and distribution of main vegetation/habitat types in Ireland; factors influencing the floristic composition of vegetation in Ireland; sampling techniques applied in field; approaches to vegetation 'classification'; succession models and examples. Prerequisite BY4104

BY4205 Agriculture 1* (Autumn/3)

4 hours per week; 13 weeks/5th semester; 26L/26LAB' ECTS credits:6

Overview of agriculture in Ireland; fertilisers and their use; environmental pollution and its avoidance; cultivation machinery; cultivation of cereals and roots, crop rotation; grassland production; grazing management of grassland, extensive and intensive methods; dry matter production; conservation of grass as hey and silage; commercial forestry production ; silvicultural practice; forest rotation ,environmental factors; utilization of forest products. Calculation of loads acting on participant in sport and exercise; net joint movements and forces; bioengineering models; measurement or estimation of muscle forces including the use of EMG; estimation of loads in bones and soft tissues; mechanical properties and behaviour of biological tissues; injury causes and prevention; aspects of techniques in sport and exercise; surfaces; shoes; other protective equipment; effects of equipment on movement patterns and their optimisation; other equipment; evaluation of rehabilitation procedures.

BY4215 Soil Science (Autumn/3)

4 hours per week; 13 weeks/5th semester; 26L/26LAB' ECTS credits:6

Geology and soil parent materials; weathering; soil composition; soil texture, structure, aeration and water movement; soil temperature; soil biology; soil organic matter and its decomposition; influence of organic matter on soil fertility; soil chemistry, cation exchange capacity, pH, liming of land; soil fertility and plant growth; soil genesis and classification, soil types, soil mapping.

BY4505 Pollution Biology*   (Autumn/3)

4 hours per week; 13 weeks/5th semester; 26L/26LAB; ECTS credits:6

Categories of freshwater pollution; indicators - biological and chemical monitoring; use of biotic indices; toxic pollutants in air, water, soil and food; introduction to toxicological principles; ecotoxicology; air pollution; major air pollutants, sources and impacts. Prerequisite BY4104

CH4003   Physical Chemistry 2 (Spectroscopy and advanced Kinetics)*   (Autumn/2)

4 hours per week; 13 weeks/3rd semester; 26L/26LAB; ECTS credits:6

Advanced topics in chemical kinetics with application to photochemistry, fast reactions, polymerisation, heterogenously and homogenously; catalytic and biochemical reactions simple absorption isotherms; applications to selected examples of industrially important

reactions Basic photochemistry and spectroscopy Rate laws, integrated and differential forms. Zero, first and second order rate laws. Mechanism of reaction, steady state approximation. Lindemann hypothesis, role of equilibria. Arrhenius equation, collision theory, activated complex theory, Fick's law, diffusion. Photochemistry, fast reactions, polymerisation. Langmuir adsorption isotherm, catalysis, Michaelis-Menten kinetics, monod kinetics. Applications to selected examples of industrially important reaction. Introduction to the basis of ir and uv spectroscopy. Fluorescence and phosphorescence, Beer-Lambert Law, Stern-Volmer equation laser action. *Prerequisite CH4002*

CH4005 Physical Chemistry 4(Electrochemical Applications & Tech)   (Autumn/3)

6 hours per week; 13 weeks/5th semester; 26L/13T/39LAB; ECTS credits:6

Mass Transport in Solution. Ficks Laws of Diffusion. Electron transfer reactions .Over potential Polarization effects. Electrode reactions, oxidation/reduction. Electrode kinetics, Butler-Volmer equation, limiting forms, I/E curves, interplay of mass transport and electron transport. electrical double layer. Ideally polarizable electrode, Analytical capacitance, interfacial effects, models of the double layer. techniques of electrochemistry. Polarography, steady-state, sweep, convective/diffusion and A.C. techniques. Electrodeposition: Electrocrystallisation, bath design, additives (brighteners, throwing and levelling power)Surface treatment: Anodizing, electroforming, electrochemical (E.C.)machining, E.C. etching, electropolishing. Production: Electrocatalysis ,chlor-alkali cells, electrosynthesis, metal extraction/refining. *Prerequisite CH4004*

CH4055   Environmental Catalysis (Autumn/3)

6 hours per week; 13 weeks/5th semester; 26L/13T/39LAB; ECTS credits:6

Introduction to catalysis, defining the environmental problem,catalyst structure and preparation,deNOx from stationary sources,deNOx from mobile sources, destruction of VOCs,SO2 control,control of dioxins,wet air oxidation,catalyst characterisation,surface area analysis,XRD,XPS *Prerequisite CH4202*

CH4103 Organic Chemistry 2 (Autumn/2)

5 hours per hour; 13 weeks/3rd semester; 26L/39LAB; ECTS credits:6

Carboxylic acids and derivatives (acid chlorides,anhydrides,esters and amides):nomenclature methods of preparation,pKa as a measure of acidity; nucleophilic displacement reactions. Aromaticity and resonance stabilisation: Huckels rule , electrophilic aromatic substitution orientation ,activating and deactivating effects Stereochemistry: configuration, chirality, optical activity, R/S nomenclature and the sequence rules, Fischer projections enantiomers, diastereomers, meso forms, resolution of a racemic mixture. Kinetics and Mechanism: establishing a reaction mechanism, kinetics, stereochemistry. Rearrangement reactions: Wagner-Meerwien, Pinacol-Pinacolone, Beckman Concerted Reactions: Basis of Woodward-Hoffman rules, elementary electrocyclic and cycloaddition reactions. *Prerequisite CH4102*

CH4107   Industrial Process Chemistry 1* (Autumn/4)

2 hours per week; 13 weeks/7th semester; 26L; ECTS credits:6

Insecticides: organophosphates and carbamates: Malathion, parathion and carbaryl, synthesis, mode of action as inhibitors of acetylcholinesterase, role of acetylcholine and acetylcholinesterase.Herbicides 2,4,5-T and 2,4-D,mode of action as auxin analogs, synthesis , dioxin formation, nucelophilic aromatic substitution reactions .Antibiotics: sulfonamides, synthesis, mode of action ; penicillins ,mode of action as inhibitors of cell wall synthesis,role of transpeptidase enzymes, synthesis of semi-synthetic penicillen structures. Analgesics and antiarthritic compounds: asprin, ibuprofen and naproxen, synthesis of naproxen, resolution and racemisation aspects .Review of functional group chemistry. *Prerequisites CH4102,CH4103,CH4104*

CH4153   Organic Chemistry 2B (Autumn/2)

4 hours per week; 13 weeks/3rd semester; 26L/26Lab; ECTS credits:6

Carboxylic acods and derivitives (acid chlorides,anhydrides, esters and amides):nomenclature, methods of preparation,pK2 as a measure of acidity; nucleophilic displacement reactions .Armoaticity and resonance stabilization :Huckels rule ,electrophilic aromatic substitution,orientation,activating and deactivating effects.Stereochemistry:configuration, chirality, optical activity,R/S nomenclature and the sequence rules, Fischer projections ,enantiomers, diasteromers,meso forms, resolution of a racemic mixture. Kinetics and Mechanism:establishing a reaction mechanism, kinetics, stereochemistry. Rearrangement reactions:Wagner-Meerwein, Pinacol-Pinacolone ,Beckmann. Synthetic methodology, retrosynthetic analysis. *Prerequisite CH4102*

CH4203 Inorganic Chemistry 2*   (Autumn/2)

5 hours per week; 13 weeks/3rd semester; 26L/39Lab; ECTS credits:6

Periodic table and important trends; s-block, p-block, d-block and f-block elements. Chemistry of s and p block elements group by group. Electrode potential diagrams. Comparison of main group and transition metals. Hard and soft acid and base theory. Complexes: structure, isomerism, magnetic and spectroscopic properties. Properties of first row transition metals. Organometallic compounds. Comparison of first row and second and third row transition metals. Chemistry of the lanthanides. Survey of biological importance of the elements *Prerequisite CH4701, CH4202*

CH4253   Inorganic Chemistry 2B (Autumn/2)

6 hours per week; 13 weeks/3rd semester; 26L/13T/39LAB; ECTS credits:6

Periodic Table and important trends; polarising power; chemistry of s and p block elements; electrode potential diagrams; hard and soft acid and base theory; complexes; properties of ; transition metals; organometallic compounds; lanthanides. *Prerequisites CH4701,CH4252*

CH4303 Analytical Chemistry 1 (Autumn/2)

6 hours per week; 13 weeks/3rd semester; 26L/13T/39LAB; ECTS credits:6

The electromagnetic spectrum; spectrophotometry; atomic spectroscopy]; infra-red spectroscopy; NMR spectroscopy; uv-vis spectroscopy. *Prerequisites CH4701,PH4202*

CH4305   Analytical Chemistry 3*   (Autumn/3)

6 hours per week; 13 weeks/5th semester; 26L/13T/39LAB; ECTS credits:6

Errors in chemical analysis and the statistical evaluation of analytical data; analytical separations; introduction to chromatography; gas chromatography; liquid chromatography; surface analysis; mass spectrometry; surface analysis. *Prerequisites CH4303,CH4304*

CH4405   Process Technology 2   (Autumn/3)

6 hours per week; 13 weeks/5th semester; 26L/13T/26LAB; ECTS credits:6

Fluid mechanics; momentum transfer; the Bernoulli equation; flow in pipes and vessels; dimensional analysis; size reduction of solids; settling; fluidised beds; filtration; heat transfer; heat transfer coefficients; heat exchangers. *Prerequisite CH4404*

CH4407   Process Technology 4*   (Autumn/4)

5 hours per week; 13 weeks/7th semester; 26L/13T/26LAB; ECTS credits:6

Mass transfer diffusion in gases and liquids, laws of diffusive flux mass transfer in solids, unsteady state mass transfer .Mass transfer across phase boundaries, mass transfer coefficients. Separation operations vapour-liquid systems, plate and packed columns, McCabe Thiele plots, equilibrium stages, stage efficiencies, HETP and HTU,NTU approaches to packed column design. Distillation, continuous and batch. Gas absorption and stripping .Use of triangular composition diagrams, leaching and liquid-liquid extraction ,mixer-settlers .evaporation, forward and back-feed operation, efficiency. *Prerequisite CH4404,CH4405*

CH4415   Process Technology 3   (Autumn/3)

5 hours per week; 13 weeks/5th semester; 26L/13T/26LAB; ECTS credits:6

Reaction engineering: calculation of equilibrium conversion and reaction enthalpy; material and energy balances; ideal reactor types and design equations; design for single and multiple reactions; temperature effects on reactor design; assessment of and models for non-ideal reactor behaviour; reactor design for heterogeneous reactions.

CH4701   General Chemistry A   (Autumn/1)

4 hours per week; 13 weeks/1st semester; 26L/26LAB; ECTS credits:6

Simple characterisation of atoms and molecules basic atomic structure, ions and isotopes, atomic and molecular weights, the mole concept. early chemical concepts and their present day uses:eg.Dalton Atomic Theory, Avogadro's Law, oxidation and reduction. Chemical nomenclature. Modern theories of atomic and molecular structure. Quantum mechanical description of the atom: Schroedinger Wave Equation , atomic orbitals and quantum numbers. Introduction to chemical bonding. Bond representation by Lewis dot, valence bond and molecular orbital structures. Hybridisation. Periodic classification of the elements. The gas Laws, Stoichiometry. Classification of chemical reactions. The Electrochemical Series. Chemical equilibrium. Liquid solution chemistry. Acids and bases. Selected applications of chemistry in domestic.medical and industrial enviornments.

CH4751   Introduction. Chemistry (Autumn/1)

4 hours per week; 13 weeks/1st semester; 26L/26LAB; ECTS credits:6

Atomic structure and theory, orbitals, the build up of the periodic table, periodicity of chemical behaviour; the mole concept; stoichiometry; oxidation and reduction processes; the balancing of chemical equations. Gay Lussac's Law and Avogoro's Hypothesis, atomic and molecular weights. Chemical equilibrium, equilibrium constant, Le Chatelier's Principle. Theories of acids and bases, the pH scale, the gas laws and kinetic theory gases. Thermochemistry; Heats of reaction. Chemical bonds, ionic covalent and metallic models, hydrogen bonds, Van de Waals forces. Introduction to organic chemistry, common functional groups-standard nomenclature and characteristic reactions. Organic polymers.

CH4807   Computational Chemistry (Autumn/4)

5 hours per week; 13 weeks/7th semester; 26L/13T/26LAB; ECTS credits:6

Chemical applications of numerical methods; Chemical structure and energy calculations; software packages. Prerequisite ME4642

CH4817   Quantum Chemistry (Autumn/4)

3 hours per week; 13 weeks/7th semester; 26L/13T; ECTS credits:6

Postulates: eigenvalue, eigenfunction, operators, average values. Systematic development of nonrelativistic quantum mechanics: particle in 1-D, 2-D and 3-D box, harmonic oscillator, particle on ring, rigid rotator and hydrogen atom. Perturbation theory, variation method. Quantum concepts in spectroscopy and molecular bonding; electronic, infrared, NMR.Rational and Huckel theory.

EQ2001 Horsemanship 1   2-0-3 (Autumn/1)

5 hours per week; 13 weeks/1st semester; 26L/39LAB; ECTS credits:6

The principles of the riding and training of the horse for leisure,sport or sale.The theory,practice and psychology of the methods used. Safety for both the horse and rider while riding, training and handling of the horse.Developing a philosophy about riding and training. Definition of lay and scientific terms commonly used in the horse industry. Basic horse and stable management.

EQ2003 Horsemanship 3 (Autumn/2)

5 hours per week; 13 weeks/3rd semester; 26L/39LAB; ECTS credits:6

Basic and elementary standard dressage requirements; lateral work, lengthened and shortened paces; jumping exercises; problem solving both on the flat and over fences.

EQ2101 Horsemanship 1A (Autumn/1)

5 hours per week; 13 weeks/1st semester; 26L/39LAB; ECTS credits:6

Students will develop foundation skills to enable them to ride, demonstrate and teach safe basic methods of equitation.

EQ2103 Horsemanship 3A (Autumn/2)

5 hours per week; 13 weeks/3rdsemester; 26L/39LAB; ECTS credits:6

The teaching methods and various systems of training used for riding and elementary dressage; lateral work, lengthened and shortened paces; jumping exercises; modern methods of solving problems both on the flat and over fences from a teaching point of view.

EQ4001   Principles of Equitation (Autumn/1)

5 hours per week; 13 weeks/1st semester; 26L/39LAB; ECTS credits:6

Principles of equine management; equine welfare; basic equine psychology; history and evolution of equitation; the classical and academic approach to riding.

EQ4003 Equine Exercise Science 2* (Autumn/2)

5 hours per week; 13 weeks/3rd semester; 26L/39LAB; ECTS credits:6

Practical application of detailed biomechanical and video analysis of dressage show jumping and eventing techniques with particular reference to movement analysis; analysis of the effects of stress to the joints and main muscle groups; conditioning and supplying exercises and their beneficial effects. *Prerequisite EQ4001*

EQ4005 Equine Performance* (Autumn/3)

4 hours per week; 13 weeks/5th semester; 26L/26LAB; ECTS credits:6

Concept of Physical Fitness including the parameters and specificity: Endurance training Strength and Power Training Interval   Training Expected changes associated with different training methods. Evolution of training methods. Comparative study of the similarities and differences in the approaches to the training of the human and equine athlete. The course will be taught through lectures, seminars, tutorials and practical work.

EQ4007 Equine Competition 1* (Autumn/4)

5 hours per week; 13 weeks/7th semester; 26L/39LAB; ECTS credits:6

Classical dressage including its historical background and social significance development from 16th century to the present day; study and analysis of the science and sport of showjumping; methods of training, breeding and production; importance of showjumping to the Irish horse industry; analysis and study of the evolution of eventing form the military use of the horse to the present day international requirements. *Prerequisite EQ4026*

EQ4017 Equine Teaching Principles 1 (Autumn/4)

5 hours per week; 13 weeks/7th semester; 26L/39LAB; ECTS credits:6

The teacher; the pupil and the equine; conceptions of teaching; class management; discipline-communication and respect; aims and objectives; experience and learning; lesson plans; short term and long term; group lessons and individual Lessons; equestrian teaching methods; teaching aids.

EQ4026 Advanced Riding Techniques and Problem Analysis   (Autumn/3)

5 hours per week; 13 weeks/6th semester; 26L/39Lab; ECTS credits:6

Analysis of advanced techniques and methods of training.Evaluation of mechanical aids to riding.Identification and analysis of specific problems associated with advanced training.Corrections based on scientific,practical and psychological theory.Problems caused by unsoundness or injury.

ER4101 Systematic Environmental Science (Autumn/1)

3 hours per week; 13 weeks/1st semester; 26L/13T; ECTS credits:6

Ecosystem functioning; environmental monitoring; environmental technology.

ER4405 Conservation Ecology (Autumn/3)

4 hours per week; 13 weeks/5th semester; 26L/26LAB; ECTS credits:6

Legislation; governmental and other agencies; Selection of areas for conservation; theory and practice of management for conservation; habitat rehabilitation and creation.

ER4407 Environmental Management 1 (Autumn/4)

3 hours per week; 13 weeks/7th semester; 26L/13T; ECTS credits:6

The relationship between economic development and the environment: the evolution of the concept of environmental management; and global analysis of the contemporary environment; the interaction between nature, society and enterprise; resources, technology and management.

ER4417 Environmental Impact Assessment * (Autumn/4)

3 hours per week; 13 weeks/7th semester; 26L/13T; ECTS credits:6

Selection of topical project; scoping, alternatives, baseline data criteria, assessment of impact, mitigating measures, contingency measures, public involvement, EIS production. *Prerequisite ER4707*

ER4428 Utilisation of Non-Renewable Resources (Autumn/4)

6 hours per week; 13 weeks/8th semester; 39L/39LAB; ECTS credits:6

Production and sources of the major industrial minerals (metallic and non-m metallic), fossil fuels and water resources; environmental problems associated with the extraction and utilisation of mineral, energy and water resources, problems of resource depletion, conservation, recycling, substitution; case studies of specific resources relevant to Ireland: base metals, limest one groundwater, peat and natural gas, world trade in non-renewable resources; strategic minerals; global issues related to non renewable resources. *Prerequisite: CH4554*

ER4507 Effluent Control - Waste Management 1 (Autumn/4)

3 hours per week; 13 weeks/7th semester; 26L/13T; ECTS credits:6

Principles of waste water management; effects of waste on receiving water sites and groundwater; pollutant tests; legislation; technology of waste water treatment and disposal; biological treatment of waste water - biological kinetics: activated sludge, trickling filter; sludge disposal; tertiary/advanced process; waste water reclamation.

ER4607   Clean Technology 1*   (Autumn/4)

5 hours per week; 13 weeks/7th semester; 26L/13T/26LAB; ECTS credits:6

Survey of methods of improving or optimising the process chemistry for specific industrial processes; the development of alternative processes with lower energy and material demands or waste production; the role of biotechnology and the use of biological raw materials in developing clean processes.

ER4707   Monitoring and Research Methods (Autumn/4)

5 hours per week; 13 weeks/7th semester; 26L/13T/26LAB; ECTS credits:6

Environmental impact assessment its role in the management of projects; scoping; data collection; impact assessment; impact evaluation; the environmental impact statement; interaction with the wider community; strategic environmental assessment; sea with regard to the energy sector, coastal zones; monitoring of emissions, including noise; environmental auditing; collection and encoding of data; multivariate approaches.

ER4708 Biometrics (Autumn/4)

4 hours per week; 13 weeks/8th semester; 26L/26LAB; ECTS credits:6

Hands-on Experience at analysis of community ecology data; detailed consideration of the problems encountered in taking the data from field observations, encoding, options for in put to computer packages, preliminary explorative statistics, multivariate options: dendrograms, TWINSPAN, correspondence analysis, canonical correspondence analysis CANOCO.

EV2001 Irish Horse Industry   (Autumn/1)

4 hours per week; 13 weeks/1st semester; 39L/13T; ECTS credits:6

The nature and scope of the Irish horse industry; principles of agricultural economics as applied to the horse industry; structure; supply and demand factors; impact of national, EU and world trade; development opportunities; the statutory and regulatory organisations that operate, control and administer the horse industry.

EV3005 Equine Breeding and Genetics   (Autumn/3)

3 hours per week; 13 weeks/5th semester; 39L; ECTS credits:6

Review of basic genetics; transmission of genetic material; sex-determination and sex-linkage, combination of traits, selection of dominant and recessive genes: blood factor and genetic tests, blood typing and registration. Genetics and disease; contribution of chromosome abnormality to congentitics malformations, subfertility and infertility; abnormal single genes and polygenic inheritance: relationships and inbreeding; importance of relationships; pedigree records: principles of selection for quantitative traits; key factors in selection; selection of traits; breed improvement; application of relative's record to selection

EV4005 Grassland and Grazing Management (Autumn/3)

4 hours per week; 13 weeks/5th semester; 26L/26LAB; ECTS credits:6

Geology and soil parent materials. Weathering of parent materials. Soil composition, soil as a three-phase system. Soil texture, structure, aeration and water movement and the practical significance of these phenomena. Soil temperature and its control. Soil biology; soil organic matter and its decomposition; influence of organic matter on soil fertility. Soils and organic farming. Soil chemistry, cation exchange capacity, pH, liming of land. Soil mineralogy. Soil fertility and plant growth. Grassland management for working surfaces. Grassland production; grassland types, seeds mixtures, reseeding. Grazing management of grassland, extensive and intensive methods; dry matter productio], seasonal and annual, animal products. Conservation of grass as hey and silage.

EV4013   Equine Physiology (Autumn/2)

4 hours per week; 13 weeks/3rd semester; 26L/26Lab; ECTS credits:6

Integrating the student's 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. The module will be offered in a multi-media format, by lectures, practicals and tutorials.

EV4015 Equine Health and Disease* (Autumn/3)

4 hours per week; 13 weeks/5th semester; 26L/26LAB; ECTS credits:6

Diseases, disorders and other causes of equine ill health through: the digestive system, the cardiovascular system; the respiratory system; reproductive disorders; skin diseases; disorders of musculoskeletal system; ocular diseases; nervous system; the liver and kidneys; blood and haematologic disorders; plant and chemical-induced toxicities; causes; cycle of events; recognition and management of parasitic diseases; bacterial infections; fungal diseases; viral infections; immunologic-mediated conditions; management of infectious diseases and preventive measures; diseases of foals. *Prerequisites EV4012,EV4044,EV4014*

EV4017   Equine Pharmacology* (Autumn/4)

4 hours per week; 13 weeks/7th semester; 26L/26LAB;ECTS credits:6

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 equine body; antimicrobial drugs; anthelmintic medication; applied toxicology; drug assay methodology. *Prerequisites BC4902,EV4013*

FT4105 Food Process Engineering 1 (Autumn/3)

4 hours per week; 13 weeks/5th semester; 26L/26T; ECTS credits:6

To provide food technologists with an understanding of the engineering principles involved in food processing. Introduction to the basic principles of material and energy balances/transfer and the application of these principles to the areas of fluid flow, drying and evaporation as specifically required in the food industry. *Prequisite CH4404*

FT4107   Food Process Engineering 2   (Autumn/4)

3 hours per week; 13 weeks/7th semester; 26L/13T; ECTS credits:6

Application of basic engineering principles to those unit operations which are of particular relevance to the food industry. Such unit operations would include mixing, size reduction, separation, distillation and the use of flow diagrams. *Prequisite CH4404*

FT4411 Introduction to Food Science and Technology (Autumn/1)

4 hours per week; 13 weeks/1st semester; 26L/26T; ECTS credits:6

Scientific principles in the safe production, preservation and distribution of foods; role of food processing technologies in ensuring food safety; role of food chemistry in monitoring food quality; current food issues of consumer concern including bovine spongiform encephalitis (bse), genetically modified foods, e-coli 0157, h7 etc.; current technology trends to ensure greater safety and quality.

FT4415 Food Technology 2 (Autumn/3)

4 hours per week; 13 weeks/5th semester; 26L/26T; ECTS credits:6

Food processing/preservation technologies (chemicals, freezing, drying, canning, irradiation, microbiological, physiological, chemical and physical effects in foods, safety aspects of processes and post-processing storage, chilled foods, food formulation and product development, applications of hydrocolloids as gelling and thickening agents.

FT4417 Food Technology 3 (Autumn/4)

4 hours per week; 13 weeks/7th semester; 26L/26T; ECTS credits:6

Production of chemicals and biochemicals from conventional and novel crops and from slaughterhouse by-products; whol crop harvesting, agricultural refineries, integration of food, feed, energy and chemical production; biomass as an alternative renewable energy supply, bioethanol production, gasification, combustion, oil crops and the Elsbett engine.

FT4427 Food Technology 4 (Autumn/4)

4 hours per week; 13 weeks/7th semester; 26L/26T; ECTS credits:6

Physical properties of foods; instrumental methods for measurement of colour, texture, viscosity; organoleptic procedures; relationship between instrumental and sensory methods of anlysis; chemical aspects of flavour; microbiological quality standards; ISO 9002, quality systems, effects of food packaging technology on food quality during distribution and storage; human nutrition issues in food quality.

FT4437 Milk Proteins as Food Ingredients (Autumn/4)

4 hours per week; 13 weeks/7th semester; 26L/26T; ECTS credits:6

Milk protein chemistry; caseins, whey proteins, minor constituents; functional properties of milk proteins; emulsification; foaming; gelation; significance of milk protein variants to the processing properties of milk; rennet coagulation; cheesemaking; heat stability; enzymatic hydrolysis of milk proteins;commercial proteinases; hydrolysate characteristion, milk protein allergenicity; immunoreactive peptide sequences; reduced/hypoallergenic milk protein hydrolysates. Nutraceuticals/bioactive peptides; angiotensin-I-converting enzyme inhibitors; special assignments will involve review and discussion of relevant research papers.

HC4305 Land and Landscape Management (Autumn/3)

5 hours per week; 13 weeks/5th semester; 26L/13T/26LAB; ECTS credits:6

Vegetation/habitt types in Ireland; agricultural land as a habitat; vegetation development in Ireland and Northern Europe since the last glaciation; succession models and examples; commercial forestry in Ireland; species used, site-types, silvicultural sequence; introduction to landscaping; interior plant scaping; landscape management.

PH4001 General Physics 1   (Autumn/1)

5 hours per week; 13 weeks/1st semester; 26L/13T/26LAB; ECTS credits:6

Mechanics; vector algebra; Newton's laws; motion; moment of inertia; conservation of linear and angular momentum; conservation of linear and angular momentum; collisions; conservation of energy elasticity; Hook's law; fluids; laws of thermodynamics; hear transfer; wave motion; sound light; EM spectrum; sources of light; geometrical optics; components; physical optics; optical systems.

PH4011   Physics for Engineers (Autumn/1)

5 hours per week; 13 weeks/1st semester; 26L/13T/26LAB; ECTS credits:6

Mechanics; vector algebra; Newton's laws; motion; moment of inertia; conservation of linear and angular momentum; collisions; conservation of energy; elasticity; Hooke's law; the atom; semiconductors; free electron theory; elementary quantum theory; insulators, semiconductors, conductors, superconductors; electronic devices; diodes; bipolar transistor.

PH4101 Physics 1 (Mechanics and Heat)   (Autumn/1)

2 hours per week; 13 weeks/1st semester; 26L; ECTS credits:6

Mechanics: Vector algebra. Newton's laws, motion; moment of inertia, conservation of linear and angular momentum. conservation of linear and angular momentum; collisions, work, conservation of energy. gravity; elasticity, Hooke's law. fluids: Bernoulli's equation, surface tension, viscosity. heat: laws of thermodynamics, heat capacities, the ideal gas, kinetic

theory, Carnot cycles, entrophy. heat transfer. Stefan-Boltzmann Law.

PH4103 Physics 6 (Mechanics)* (Autumn/2)

5 hours per week; 13 weeks/3rd semester; 26L/13T/26LAB; ECTS credits:6

Review of the principles of mechanics; linear and angular momentum; rotational dynamics; impulsive motion; gyroscope motion; mechanical vibrations; simple and damped simple harmonic motion; forced oscillations; coupled oscillations; waves; transmission lines.

PH4203 Applied Optics 1 (Autumn/2)

Geometrical Optics: Combinations of lenses; aperture stops; lens aberrations; image formation; microscopy. Introduction to matrix methods. Wave Theory: Development of the wave equation; solution for SHO. Fourier analysis/synthesis Coherence. Physical Optics: Interferometry; Diffraction; Polarization Double Refraction; Optical Activity; Interferometer applications. Photometry: Diffuse reflectors and radiators. Luminance and illumination of an image in an optical system. Photometric units; standard sources and absolute photometry.

PH4218 Optical Fibre Communications (Autumn/?)

5 hours per week; 13 weeks/8th semester; 26L/13T/26LAB; ECTS credits:6

Optical Fibres; review of wave propagation; Maxwell's equations;refractive index; disperation; waveguide theory; weak guidance approximation; optical fibre modes; types of optical fibres; intermodal dispersion; approximation techniques; equivalent step index; Gaussian, chromatic dispersion, material and waveguide dispersion; optical fibres for dispersion control; attenuation and sources of loss; fibre cables; connectors; special polarisation and laser fibres; fibre devices; fused tapered couplers; symmetric and asymmetric couplers;wavelength division multiplexers; fibre measurements, loss measurement; dispersion; cut off wavelength; index profile; numerical aperture; optical time domain reflectometry; optical fibre systems; transmission circuits; receiver circuits; digital system planning; analogue system planning; applications; public networks; consumer electronics; industrial sensors; LAN's. *Prerequisite PH4217*

PH4301 Physics 2 (Electricity and Magnetism 1) (Autumn/1)

2 hours per week; 13 weeks/1st semester; 26L; ECTS credits:6

Electrostatics; Coulomb's law; Gauss's law; current and circuit; Ohm's law; RC circuits; magnetostatics; magnetic effect on current carrying conductors; electromagnetic induction; Faraday's law; Lenz's law; LR circuits; ac circuits; ac theory.

PH4308 Applied Electromagnetics (Autumn/4)

5 hours per week; 13 weeks/8th semester; 26L/13T/26LAB; ECTS credits:6

Maxwell's equations; and electromagnetic waves, solutions of Maxwell's equations, electromagnetic waves in free space, dielectrics and conductors; intrinsic impedance, wave attenuation, power and Poynting vector; wave reflection from conductors and dielectrics; skin effect, SWR, Brewster angle, oblique reflection, total internal reflection, polarization, power transmission, wave

momentum; transmission lines; field and circuit parameters, impedence, standing waves and Smith chart, attenuation; application of Maxwell's equations. *Prerequisite PH4304*

PH4401 Physics 3 (modern physics) (Autumn/1)

3 hours per week; 13 weeks/1st semester; 26L/13T; ECTS credits:6

Special relativity; the atom; quantum mechanics; the nucleus; radiation; radioactivity; introduction to the elementary particles.

PH4403 Physics 7 (Quantum)* (Autumn/2)

2 hours per week; 13 weeks/3rd semester; 26L; ECTS credits:6

Failures of the classical theory; experimental basis for the quantum theory; wave mechanics; De Broglie's hypothesis; Heisenberg Uncertainty principle; Schrodinger's equation; solving the Schrodinger equation
Prerequisite PH4401

PH4405 Atomic and Nuclear Physics   (Autumn/3)

5 hours per week; 13 weeks/5th semester; 26L/13T/26LAB; ECTS credits:6

Atomic structure; atomic spectra; wave mechanics; spin and exclusion principle; Zeeman effect.

PH4511 Introduction to Physics   (Autumn/1)

3 hours per week; 13 weeks/1st semester; 26L/13T; ECTS credits:6

The history of physics and the development of physical theory, scientific thought and the scientific method: Aristotle and the Greeks, the middle ages, the scientific revolution, Galileo and Newton, the 18th and 19th centuries, the successes and failings of classical physics; the development of modern physics, relativity and quantum theory. Methods and techniques: quantities, variables and relationships, the nature of a physical law, dimensions and units, dimensional analysis, scientific notation, orders of magnitude and their estimation; problem solving using physics, the application of theories and principles. Applied physics in engineering and technology: the role and relevance of the applied physicist in industry and other practical contexts.

PH4607 Solid State Physics 1   (Autumn/4)

5 hours per week; 13 weeks/7th semester; 26L/13T/26LAB; ECTS credits:6

Theories of conduction and magnetism]: breakdown of classical theories; magnetic properties of solids; classification of types of magnetism. Crystal dynamics: lattice vibrations; phonons; anharmonic effects; thermal conduction by phonons. Energy band theory; quantum theory of conduction.Superconductivity. Magnetism: diamagnetism; paramagnetism; magnetic order.
Prerequisite PH4403

PH4705 Instrumentation 2*   (Autumn/3)

5 hours per week; 13 weeks/5th semester; 26L/13T/26LAB; ECTS credits:6

Accuracy of measurement systems; dynamic characteristics of measurement system elements; loading effects; signals; noise; interference reduction; filtering;

data acquisition; GPIB; HPIL; RS232; Signal processing; sampling; specialised measurement systems.
Prerequisite PH4704

PH4805 Industrial Physics B* (Autumn/3)

5 hours per week; 13 weeks/5th semester; 26L/13T/26LAB; ECTS credits:6

Review of electronic materials; electronic components; IC fabrication; electronic production; PCB process; SMT thin/thick film hybrid circuits; statistical methods for process control; reliability theory.

PH4808 Industrial Physics A (Autumn/4)

5 hours per week; 13 weeks/8th semester; 26L/13T/26LAB; ECTS credits:6

Workstations]: introduction to UNIX, Windows, and CAD tools. CAD tools for optics, electromagnetics, and mechanic].CAD and IC design: the IC design process; organisation and notation. MOS devices and basic circuits; inverters; buffer circuits. Fabrication and design rules; electrical parameters; scaling.

PY4001 Human Anatomy 1 (Upper Extremnity) (Autumn/1)

3 hours per week; 13 weeks/1st semester; 26L/13T; ECTS credits:6

Anatomical position, definition of terms, classification of joints, features of joints and joint actions. Detailed structure and function (to include bones, articular surfaces, joint capsule, synovial membrane, ligaments, blood and nerve supply, lymphatic drainage, muscle attachments, joint actions and ROM) of the shoulder girdle, shoulder joint, elbow joint, radio-ulnar joints, wrist, hand and finger joints. Analysis of basic functional activities.

PY4101 Biological Science 1 (Autumn/1)

4 hours per week; 13 weeks/1st semester; 26L/26LAB; ECTS credits:6

Theoretical studies of the biological basis of human movement. Concepts to be applied and serves as a basis for physical conditioning methods. Content will include anatomy and physiology with particular reference to cardiovascular systems and their adaptations to exercise and training; an overview of the physiological system of fitness; principles of training; warm-up and cool down procedures; introductory weight training; flexibility and interval exercise.

PY4105 Biological Science 2 (Autumn/3)

4 hours per week; 13 weeks/5th semester; 26L/26LAB; ECTS credits:6

Theoretical and applied biological and training concepts; growth and physical development of the child, posture and body mechanics; critical analysis of sources of information in exercise sciences; care and prevention of injuries; advanced weight training; advanced exercise to music; exercise prescription; planning exercise programmes.

FACULTY OF SCIENCE AND ENGINEERING – Spring

Computer Science Modules

CE4204 Operating System 1   (Spring/2)

3 hours per week; 13 weeks/4th semester; 26L/13T; ECTS credits:6

Operating system definitions, components, command shells, services overview; review of 80x86 assembly language programming techniques; MS-DOS memory map organisation; process execution; interrupt handlers; resident utilities; data structures used in operating system design; disk storage organisation; introduction to Microsoft Windows.

CE4206 Operating Systems 2* (Spring/3)

5 hours per week; 13 weeks/6th semester; 26L/13T/26LAB; ECTS credits:6

Process communication; memory management; file systems to support multi-tasking; deadlock; input/output; computer security and protection; analytic modelling; case study; project. *Prerequisite CE4204*

CE4208 Distributed Systems *   (Spring/4)

5 hours per week; 13 weeks/8th semester; 236L/13T/26LAB; ECTS credits:6

Overview of distributed computing; process and communication models; naming, identification and location of resources, services and objects; concurrency and synchronisation in distributed environments; remote procedure calls; integrity and security; review of distributed object-oriented middle ware. *Prerequisite CE4206*

CE4218 Real Time Systems   (Spring/4)

5 hours per week; 13 weeks/8th semester; 26L/13T/26LAB; ECTS credits:6

Introduction to language features; operating system features; design approach; design and modelling using petri nets; design and analysis; real-time program verification; formal techniques; case study.

CE4516 Digital Systems 5   (Spring/3)

5 hours per week; 13 weeks/6th semester; 26L/13T/26LAB; ECTS credits:6

The benefits of a fully-synchronous sequential system; sequential circuits; Moore and Mealy type circuits; use of memory as a combinatorial element; state reduction; controllers; VHDL; project.

CE4518 Computer Architecture   (Spring/4)

5 hours per week; 13 weeks/8th semester; 26L/13T/26LAB; ECTS credits:6

Review of Von-Numann architecture; computer performance measurement; floating point arithmetic; instruction set design and architecture; processor implementation techniques; pipe lining; memory hierarchy design.

CE4608 Computer Networks   (Spring/4)

3 hours per week; 13 weeks/8th semester; 26L/13T; ECTS credits:6

Local area versus wide-area networks. Topology and standards. ISDN and B-ISDN, narrowband and broadband, services, interfaces, and protocols. System Communication Design Considerations. Design and validation of communication protocols**.** Data security in networks**,** network security threats and encryption fundamentals

CE4702   Computer Software 2 (Spring/1)

4 hours per week; 13 weeks/2nd semester; 26L/26LAB; ECTS credits:6

Overview of C; comparison of C and other procedural languages; C program development environments; format studies and good practices; constants and variables; operators and expressions; functions and program structure; C preprecessor; type definitions; programming practice; coding, style, documentation.

CE4704 Computer Software 4   (Spring/2)

4 hours per week; 13 weeks/4th semester; 26L/26LAB:ECTS credits:6

Introduction to C++; introduction to computer graphics; primitive graphics operations; graphical user interfaces; overview of the object-oriented and other programming paradigms.

CE4706 Software Engineering 1 (Spring/3)

5 hours per week; 13 weeks/6th semester; 26L/13T/26LAB; ECTS credits:6

Introduction to Software Engineering; Software Specification, System Modelling; Software Design; Function Oriented Design; Software Reviewing and Testing; Software quality Assurance and metrics; Case Study and Project.

CE4708 Artificial Intelligence   (Spring/4)

5 hours per week; 13 weeks/8th semester; 26L/13T/26LAB; ECTS credits:6

Logic programming in prolog; state space search; heuristic search; game-playing programs; alternative knowledge representation formalisms; expert systems.

CE4808 Computer Graphics (Spring/4)

5 hours per week; 13 weeks/8th semester; 26L/13T/26LAB; ECTS credits:6

Bit-mapped graphics; viewing in two dimensions; viewing in three dimensions; representation of three dimensional shapes; hidden lines and surfaces; shading. *Prerequisite: CE4704*

CE4818 Digital Signal Processing 2   (Spring/4)

4 hours per week; 13 weeks/8th semester; 26L/26LAB; ECTS credits:6

The fast Fourier transform; digital filter structures; architectures for signal processing. *Prerequisite: CE4817*

CS4004 Software Testing and Inspection (CSI 2-1-1)

4 hours per week; 13 weeks/4th semester; 26L/13TUT/13LAB; ECTS credits:6

On successful completion of this module students will be able to take a program specification, write corresponding test cases; given a specification and an implementation of a program, write the tests, run them, and report on the errors found. Brief syllabus: introduction to testing; limitations of testing; test types and their place in the software development process; program reading and comprehension; refactoring code; inspections, walkthroughs and desk-checking; programming with assertions; using a debugger for white-box testing; reporting and analysing bugs; test case design; test case execution and regression testing; requirements for white-box and black-box testing tools;

CS4006 Intelligent Systems (CSI 2-1-1)

4 hours per week; 13 weeks/6th semester; 26L/13TUT/13LAB; ECTS credits:6

To familiarise students with a targeted subset of the principles and methods of Intelligent Systems, and distinguish between Cartesian artificial intelligence (AI) and intelligent systems. Brief 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. The course includes the history and development of Intelligent system concepts through AI and Expert Systems to Cognitive Science and issues in representation, reasoning and machine learning.

CS4008 Enterprise Resource Planning (CSI 2-1-0)

3 hours per week; 13 weeks/8th semester; 26L/13TUT; ECTS credits:6

To provide a comprehensive knowledge and understanding of the role of information systems and information technology in the the planning and control of organisational activities, with particular emphasis on the selection and implementation of Enterprise Resource Planning (ERP) software. Since ERP systems originated in the manufacturing sector, the module will centre on their application in a manufacturing context, extending to the integration of other organisational functions such as personnel, accounting and customer relationship management. Brief syllabus: Evolution of Planning Systems: MRP, MRP II, ERP; Core Business Processes; Core subsystems of Enterprise Resource Planning; Concepts and terminology of manufacturing and supply chains; Data reference models for manufacturing; CIM-OSA; The manufacturing database; Material Requirements Planning; Supply Chain Management; Production planning and control systems; Demand Management: Forecasting; Master scheduling; Distribution Planning and Control; Advanced Planning and Scheduling Systems; Capacity Planning Systems; Just In Time systems and techniques; Computer Integrated Manufacturing principles; OSI and Manufacturing Automation Protocol (MAP); Implementation of ERP systems; Business Process Re-Engineering (BPR).

CS4012 Modelling and Representation (CSI 2-1-1)

4 hours per week; 13 weeks/2nd semester; 26L/13TUT/13LAB; ECTS credits:6

This module aims to provide students with an understanding of how different kinds of phenomena are represented as digital information. Its objectives are to give students an appreciation of the role of software in rendering and manipulating digital representations, and an introduction to the skills and techniques of abstract representation (modelling) of social and economic phenomena. Brief syllabus: mapping between the represented and representing world; intrinsic versus extrinsic mappings; representing information in various forms of media; document content and structure; content model; semantic structure; metadata and metatags; modelling correlations among media objects; simulation versus animation; model criteria; models versus real systems; abstraction and similarity; classification and types of models; metaphor as a special type of model; purposes of models; analyzing social, biological and business phenomena, in order to design and construct models of those phenomena; models in software development; formal approach to building models; model validation and documentation; developing model templates;

CS4028 E-Business Architectures (CSI 2-1-1)

4 hours per week; 13 weeks/8th semester; 26L/13TUT/13LAB; ECTS credits:6

On successful completion of this module students should be able to: select an appropriate e-business model for a given situation and design the system accordingly; select an appropriate e-business framework and tailor it to a given situation; demonstrate an awareness of the legal, ethical and security issues surrounding e-business; In addition, students should be aware of trends affecting e-business. Brief syllabus: Components of a business model; structure of an e-business model (EBM); classification of EBMs; taxonomy of EBMs; logical, technological, and organisational architecures for e-business; the value of e-business frameworks (EBFs); EBF functionality; EBF types; EBF categories; enabling technology; overview and architecture of EBFs; criteria for evaluating EBFs; what qualifies as web services; web services technologies; web services architecture; e-marketing and e-advertising concepts; e-customer relationship management; search-engine registration; social, legal and ethical issues in e-business; network security; wireless technology and m-business: location-identification technologies, wireless marketing, wireless payment options, privacy and the wireless internet;

CS4112 Computer Science 2* (Spring/1) (CSI 2-1-1)

5 hours per week; 13 weeks/2nd semester; 26L/13T/26LAB; ECTS credits:6

Aims: To introduce students to formal ways of thinking about programs, in terms of their syntactic structure, their design, and formal assertions about the progress of a computations. On successful completion of this module the student should be able to: recognise the equivalence of mathematical functions and computer programs; construct assertions about a program, and combine them into an inductive proof concerning the programs behaviour; understand underlying mathematical structures of such structures as record-structures, arrays and enumerated types, as well as constructs such as the assignment statement, the conditional expression, and formalise the signatures of operations on these structures; given an informal definition of a construct, to define its syntax as a set of productions in one of the common metalanguages, to parse strings of text to determine if they are syntactically correct, and to ascertain whether static semantic constraints have been satisfied; understand the mathematical basis of common patterns, such as inducing of an n-ary operator from a binary operator, and to apply these patterns to different problems; specialise and combine simple design patterns, so as to derive a single inductive definition of a program implementing the evaluation of several functions, and to derive functional recursive and iterative programs. Brief syllabus: set

theory, functions; propositional logic; constructing assertions about individual program statements; Inductively defined functions; recursive and iterative implementations of inductively defined functions; proof by induction of assertions about simple while programs; structural induction and it's use in describing the syntax of arithmetic and boolean expressions; regular and context free grammars; BNF, EBNF, syntax charts; composite types such as records and arrays in terms of Cartesian products, disjoint unions, finite maps and powersets; type completeness. copy semantics; *Prerequisite CS4111*

CS4115 Data Structures and Algorithms (CSI 2-1-1)

4 hours per week; 13 weeks/4th semester; 26L/13TUT/13LAB; ECTS credits:6

To provide a uniform theoretical treatment of the data structures and algorithms used in systems and applications programming. This course includes a practical component to reinforce learning and to encourage students in the practical use of theoretical material. On successful completion of this module students should be able to select appropriate data structures given requirements for data storage and data retrieval patterns. In addition, students should be able to identify the trade-offs of various graph representation schemes. Brief syllabus: mathematical review, binary trees, linked lists and networks; recursion; divide and conquer algorithms: quicksort, heapsort, merge sort and bin and radix sorting; tree searching; graph algorithms.

CS4125 Systems Analysis (CSI 2-1-1)

4 hours per week; 13 weeks/6th semester; 26L/13TUT/13LAB; ECTS credits:6

To equip the students with the knowledge and techniques required to plan and control the analysis and design phases of the information systems life cycle. On successful completion of this module students should be able to: use object modelling techniques (e.g., class diagrams, object interaction diagrams, sequence diagrams) to represent a given problem situation; evaluate a given design using criteria such as modularity, information hiding, coupling and cohesion; choose between process modelling and object modelling for a given problem situation. Brief syllabus: this module focuses on the requirements, analysis, and design phases of systems development life cycles using an object-oriented method and the unified modelling language (UML); various software lifecycles are introduced to provide the student with a conceptual map of the different phases and approaches used in software development; reuse of artefacts is discussed and emphasised using analysis and design patterns, architectural styles, and frameworks; and through the production of model artefacts that facilitate reuse.

CS4158 Programming Language Technology (CSI 2-1-2)

5 hours per week; 13 weeks/7th semester; 26L/13TUT/263LAB; ECTS credits:6

Aims: 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. Objectives: On completion of the module, Students should be able to:- Carry out simple transformations of context-free grammars, and construct LR parsing tables for simple grammars; Design a Context Free Grammar for manageable subsets of conventional programming languages; Implement a static semantic analyser and translator for the manageable subset by inserting the semantic actions in the appropriate places. Brief syllabus: natural and formal languages - moods, tenses; ideographic and phonetic alphabets - tokens; phrase structure; production systems; phrase structure grammars; Chomsky's hierarchy of grammars; languages, sentences and sentential forms derived by grammars; review of parse trees and syntax trees; generalised state machines, configurations and transitions; regular grammars, regular expressions and FSMs; software design based on REs; context free grammars; parsing: leftmost derivations and top-down parsing; table driven parsing techniques.

CS4212 Computer Organisation 2* (Spring/1) (CSI 2-1-1)

4 hours per week; 13 weeks/2nd semester; 26L/13T/13LAB; ECTS credits:6

To provide an elaboration on, and extension of topics in computer hardware and software as introduced in Computer Organisation 1. To introduce the student to programming in low level languages. Brief syllabus: extension and elaboration of topics from Computer Organisation 1; a high level view of a working computer; design of a CPU arithmetic/logic unit to implement a set of specified functions; programming in assembly language, improving program performance; introduction to microarchitectures. *Prerequisite CS4211*

CS4225 Computer Networks (CSI 2-1-1)

4 hours per week; 13 weeks/4th semester; 26L/13TUT/13LAB; ECTS credits:6

The primary aim of this module is to introduce students to the basic principles of data communications and computer networks. There is a strong emphasis on the role of standards in achieving open systems. Students who successfully complete this module should have a good understanding of the basic communication problems, and their solutions, that arise both in broadcast and in switched networks. The module aims to complement the theoretical material with a practical project. Brief syllabus: communication modelling, source and channel encoding decoding, transmission links, bandwidth, properties, noise, multiplexing, modulation, PSK, FSK, AM, Broadcast & switched Networks, Data link protocols, HDLC, Packet switching, TCP/IP, routing, addressing, masking. LANs, Ethernet, Token Rings, Hubs, Bridges, Routers. TCP Sockets.

CS4226 Distributed Systems (Spring/3) (CSI 2-1-1)

4 hours per week; 13 weeks/6th semester; 39L/13T; ECTS credits:6

The aim of this module is to provide students with a clear understanding of the issues involved in distributed computer systems. Specific objectives would be to: introduce developments in distributed systems; investigate problems of timing, naming, and location; gain practical experience of interprocess communication in a distributed environment; develop a familiarity with distributed file systems. Brief syllabus: architectural models and design

issues for distributed systems; naming, location and binding in a distributed system; DNS; network operating systems, distributed operating systems; CORBA; IP sockets for networking; RPC programming; IPC in a distributed system; distributed file systems; Sun NFS, including caching and file locking; deadlock prevention, avoidance, detection and recovery; distributed deadlocks; fault tolerance; security; protection mechanisms; access matrix; Kerberos.

CS4228 Telecoms Network Architectures*+ (Spring/4) (CSI 2-1-0)
6 hours per week; 13 weeks/8th semester; 26L/13T/39LAB; ECTS credits:6

This module is the 2nd in a stream of 2 modules in Telecommunications. The aim of this module is to present further relevant topics in the field of Telecommunications. In particular it first presents the essence of signalling system 7 (SS7), which is then followed by mobility and intelligent networking sections. Students who complete this module stream should have a good understanding of the structure and operation of modern telecommunication networks. Brief syllabus: subscriber and trunk signalling systems, DSS1 signalling, Trunk signalling characteristics, CAS and CCS signalling; SS7, MTP, signalling data link signalling link and signalling network functions. Reliability, SCCP. Addressing, Transport services; Mobile networks, radio transmission, air interface features, Principles of IN, in fixed and mobile networks; GPRS. *Prerequisite CS4218*

CS4358 Interactive Multimedia (CSI 2-1-0)

3 hours per week; 13 weeks; 26L/13T; ECTS credits:6

To understand the principles and techniques of Interactive Media. Content creation, processing and management. High-level authoring. Distribution methods. Intellectual Property Rights. Brief syllabus: Introduction to Digital Media: Cognitive Models: Interaction Design: Image, Video and Sound Processing: Authoring: Interfacing high-end authoring systems: Distribution: formats; Intellectual Property Rights.

CS4416 Database Systems (Spring/3) (CSI 2-1-0)

3 hours per week; 13 weeks/6th semester; 26L/13T; ECTS credits:6

Large-scale data management is a critical activity within modern organisations. The goal of this module is to explain the relevance and explore the fundamental principles of database technology. On successful completion of this module students will be able to write programs that use static and dynamic embedded SQL, cursors, triggers and so forth. Brief syllabus: The concept of a DBMS and DB Architectures are introduced. This module will build upon the notion of a database as introduced in CS4513 and as such contains a revision of those concepts previously introduced, i.e. the relational data model, including issues, such as, Integrity Constraints, Relational Algebra, Relational Calculus, SQL, and Views. Normalisation. Time will be spent discussing the various technologies behind a DBMS, such as, transactions, security, data storage, triggers, and query optimisation as well as writing programs incorporating these. Object DBs, Object Relational DBs and their relevance to the OOP paradigm are discussed. Concepts of Data Warehousing, Data Mining and Decision Support are introduced followed by discussions on the Emerging Technologies of Database Systems. *Prerequisite: CS4213*

CS4458 Computer Support Cooperative Work (CSI 2-0-2)

4 hours per week; 13 weeks/8th semester; 26L/26LAB; ECTS credits:6

This course 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 do a project in the course.

CS4512 Imperative Programming 2 (Spring/1) (CSI 2-2-2)

6 hours per week; 13 weeks/2nd semester; 26L/26T/26LAB; ECTS credits:6

Aims: To continue with the design approach adopted in Imperative Programming 1, through a series of design exercises given in tutorials. To introduce some classical algorithms, data structures, and advanced programming constructs, in the design and implementation of more complex programs. To place an emphasis on functional abstraction. Objective: On successful completion of this module the student should be able to design and program solutions to more complex problems, using two-dimensional arrays, recursion, files, linked lists, queues and stacks. Brief syllabus: Functions and parameter types; functions as variables; pointers, dynamic data, and referencing; relationships between pointers and arrays; two-dimensional arrays and their manipulation; iterative and recursive solutions; design and implementation of recursive algorithms; file processing; file types; file processing algorithms; linked list data structure; memory allocation for lists; array implementation of a linked list; basic stack operations; array and linked list implementations; arithmetic expression evaluation using stacks; stacks and recursion; abstract data types; *Prerequisite Imperative Programming I*

CS4558 Leveraging Legacy Applications (CSI 2-0-2)

4 hours per week; 13 weeks/8th semester; 26L/13LAB; ECTS credits:6

This course will provide students with the knowledge and skills required to integrate legacy applications into next generation business systems. Brief syllabus: Software Re-engineering of COBOL programs, Integrating Legacy Systems using Object Wrappers, Web enablement and GUI front ends. Interfacing with middleware (CORBA, DCOM, ODBC, COM etc).

CS4566 Requirements Engineering* (Spring/3)

4 hours per week; 13 weeks/6th semester; 26L/13T/13LAB; ECTS credits:6

To give students the knowledge and skills to be able to elicit, specify, document, communicate, manage and validate the requirements for software-based systems, along with an awareness of the organisational and social issues surrounding this important aspect of software engineering. Brief syllabus: the requirements engineering process; methods and techniques for the elicitation and discovery of system and software requirements; the modelling and analysis of requirements; the documentation of requirements, the communication of requirements, tools for the management of requirements; the validation and agreement of requirements; organisational and social

issues surrounding these. *Prerequisite – Systems Analysis and Design*

CS4613 Information Systems in Context (CSI 2-1-1)

4 hours per week; 13 weeks/3nd semester; 26L/136T/13LAB; ECTS credits:6

1. Define/explain terms and concepts of systems, information and organisations. 2. Discuss the history of Computing and the major characteristics of the Digital world. Debate the major ethical problems posed by the digital world. 3. Define & compare the various types of System & Application software used in organisations. 4. Describe the major Internet applications, e-business models, issues and technology. 5. Explain and debate the use of Information Systems for decision making & support, for business & global integration, for gaining strategic & competitive advantage, for business reengineering & knowledge management. 6. Define the major threats to Information Systems & describe the components of IS's security plan. Brief syllabus: his is an introductory core course concerning the nature of information systems. The focus will be on understanding the social, organizational, and historical context of information systems as they have developed over the years, and investigating possible futures for the field. The course will introduce a range of fundamental concepts and concerns in the computing field, while at the same time providing a number of case studies that illuminate these concepts.

CS4818 Professional Issues in Software Engineering (Spring/4) (CSI 2-1-0)

4 hours per week; 13 weeks/8th semester; 26L/26T; ECTS credits: 6

Professional Issues in Software Engineering (PISE) is concerned with the ethical and social impact issues surrounding computer science. The primary aim of this module is to encourage students to develop the ethical foundations of good professional practice in computing. Ethical theories and their role in maintaining good practice in the development and implementation of computer systems will be explored. Legal issues associated with professional behaviour will also be examined. Brief syllabus: PISE focuses on the moral, ethical and legal issues that will confront a computer professional in his or her work. Using case studies and scenarios different potential areas of legal and moral conflict will be examined. *Prerequisite: CS4817*

CS4826 Human/Computer Interaction (Spring/3) (CSI 2-1-2)

5 hours per week; 13 weeks/4th semester; 26L/13T/26LAB; ECTS credits:6

The objective of this course is to develop an understanding of the issues involved in the increasingly important area of human-computer interaction. The course 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". Brief syllabus: the nature of HCI; understanding the user; human information processing; perception; interfaces and interaction; input and output devices; use & design; the design process; requirements; valuation; usability methods and tools; empirical and analytical methods; standards & guidelines; mobile technology; information appliances; social and organizational constraints; intelligent agents; future trends.

EE4004 Electrical Engineering 2 (Spring/2)

4 hours per week; 13 weeks/4th semester; 26L/26LAB; ECTS credits:6

Electromagnetic induction; energy storage elements; sinusoidal signals; three phase systems; tuned circuits; coupled circuits.

EE4008 Avionics (Spring/4)

4 hours per week; 13 weeks/8th semester; 26L/26T; ECTS credits:6

Introduction to navigational, communications and air traffic control systems; radio wave propagation and radiation; introduction to radar; basic radar principles; pulse radar; radar transmitters and receivers; radar displays; doppler radar; secondary radio; navigation aids for aircraft; aircraft guidance and control, collision avoidance systems; instrument landing systems; satellite navigation systems.

EE4018 Engineering Management (Spring/4)

3 hours per week; 13 weeks/8th semester; 26L/13T; ECTS credits:6

The firm and its environment; introduction to economic, managerial, behavioural and social responsibility theories of organisational objectives; present market trends and business in the 21st Century; general external analysis (national, international and global) industry analysis, internal analysis; specific functional activities; finance; human resource management; information technology; operations management.

EE4108 Microwave Devices* (Spring/4)

3 hours per week; 13 weeks/8th semester; 26L/13T; ECTS credits:6

Microstrip and stripline; waveguides; microwave measurements; microwave solid state amplifiers and oscillators; cavity and slow wave devices. *Prerequisite EE4117*

EE4114 Circuit Analysis 2 (Spring/2)

5 hours per week; 13 weeks/4th semester; 26L/13T/26LAB; ECTS credits:6

Fourier Series; Matrix Analysis; Filters; distributed Parameter circuits.

EE4117 Electromagnetics 1 (Spring/4)

Electrostatics; magnetostatics; time varying field; transmission lines.

EE4207 Industrial Automation (Spring/4)

3 hours per week; 13 weeks/7th semester; 26L/13T; ECTS credits:6

Motors used in motion control, drive electronics, controllers, sensors/transducers, computer based controllers, pneumatics, programmable logic controllers (PLCs) and industrial networks; the study of the design of automated work cells and the integration and control of automated processes/ work-cells within the production environment.

EE4214   Control 1* (Spring/2)

5 hours per week; 13 weeks/4th semester; 26L/13T/26LAB; ECTS credits:6

Actuators and dynamic system modelling; system time response; system frequency response; frequency domain compensation; transducers. *Prerequisite EE4113*

EE4218 Control 2   (Spring/4)

3 hours per week; 13 weeks/8th semester; 26L/13LAB; ECTS credits:6

Optimal control; adaptive control; predictive control. *Prerequisite: EE4217*

EE4227 CAD/CAM Systems   (Spring/4)

4 hours per week; 13 weeks/7th semester; 26L/26LAB; ECTS credits:6

The CIM philosophy, designing CM systems, systems analysis, computer based production management systems, CIM data flows; CAD/CAM principles, computer aided design and engineering, electrical/electronic drafting and design, simulation; computer aided manufacture, NC/CNC, robotics, robotic and CNC machine tool programming, FMS.

EE4308   Analogue Integrated Circuit Design* (Spring/4)

5 hours per week; 13 weeks/8th semester; 26L/13T/26LAB; ECTS credits:6

CMOS technology: processes, device modelling, layout considerations, passive components; analogue models for CMOS and bipolar devices; computer simulations; review of basic building blocks; logic gates, current mirrors, differential and high-gain stages, output buffers; design examples from bipolar and CMOS perspectives; amplifies topologies; single-stage and two-stage op-amp designs; implementations CMOS; bipolar and bi-mos processes; stability issues; specifications; simulations; on-chip implementations of continuous time filters; technology limitations; the switched capacitor alternative; development of SC design methods; stray-intensive circuitry. *Prerequisite EE4317*

EE4314   Active Circuit Design 2* (Spring/2)

5 hours per week; 13 weeks/4th semester; 26l/13T/26LAB; ECTS credits:6

Operational amplifiers characteristics; op-amp linear applications; feedback; op-amp non-linear applications; AC coupled amplifiers; tuned amplifiers; active filters; probes. *Prerequisite EE4313*

EE4316   Active Circuit Design 3* (Spring/3)

5 hours per week; 13 weeks/6 semester; 26L/13T/26LAB; ECTS credits:6

Oscillators; the Gilbert cell; phase locked loops; A/D and D/A revisited; Am receivers; FM. *Prerequisite EE4314*

EE4318   Active Circuits 5* (Spring/4)

5 hours per week; 13 weeks/8th semester; 26L/13T/26LAB; ECTS credits:6

Low-noise Amplifier Design; fundamental noise; semiconductor noise; low noise amplifiers; measurement techniques; switched mode power supply design; power switches; DC-to-DC converters; DC isolated powered supplied; soft-switching techniques. *Prerequisite EE4317*

EE4328   Power Electronics   (Spring/4)

5 hours per week; 13 weeks/8th semester; 26L/13T/26LAB; ECTS credits:6

Power switch assemblies; drive and snubber circuits; dc-to-dc converters; step-down (buck), step-up (boost) and full-bridge types; dc isolated power supplies; the forward converter, overall system design case study, with spice simulations; thermal issues; overview of soft-switching techniques; quasi-resonant and multi-resonant methods; case study; phase-shifted full bridge zero-voltage switched (ps-fb-zvs) converter design. *Prerequisite EE4317*

EE4408 Asics 2   (Spring/4)

5 hours per week; 13 weeks/8th semester; 26L/13T/26LAB; ECTS credits:6

Analogue simulation using spice, analogue asic layout techniques; asic operational amplifiers; asic d-a converters and a-d converters.

EE4416   Solid State 1 (Spring/3)

5 hours per week; 13 weeks/6th semester; 26L/13T/26LAB; ECTS credits:6

Atomic structure; semiconductor properties; solid state devices.

EE4512   Digital Systems 2 (Spring/1)

5 hours per weeks; 13 weeks/2nd semester; 26L/13T/26LAB; ECTS credits:6

Counters; MSI devices; sequential MSI; registers; logic arrays; register transfer language and introduction to simple computer organisation; simple processor operations. *Prerequisite EE4513*

EE4514   Digital Systems 4*   (Spring/2)

4 hours per week; 13 weeks/4th semester; 26L/26LAB; ECTS credits:6

Bus buffering and de-multiplexing; bus cycle timing; the memory interface; drams; I/O interfacing; the centronics and RS 232 interfaces; the P.C. expansions bus; IEEE 488 bus; typical peripheral interfaces. *Prerequisite EE4513*

EE4608   Telecommunications Systems 2 (Spring/4)

3 hours per week; 13 weeks/8th semester; 26L/13T: ECTS credits:6

General telecommunication system design; technical, economic, user and social requirements and tradeoffs; generation approach; compatibility and reverse compatibility constraints; decision bodies and processes; national and international; case studies; television systems design; linear systems analysis; radar; microwave and mm-wave telecommunication system design.
Prerequisite EE4607

EE4616   Communications and Theory* (Spring/3)

5 hours per week; 13 weeks/6th semester; 26L/13T/26LAB; ECTS credits:6

Basic structure of a communication system; communication theory; amplitude modulation; frequency modulation; receiver systems; digital signals; information theory. *Prerequisite EE4114*

EE4617 Communication Theory 1 (Spring/4)

3 hours per week; 13 weeks/7th semester; 26L/13T; ECTS credits:6

Information source encoding theory and techniques; communication channels; m-ary discrete memory less channels, binary symmetric channels; Shannon-Hartley theorem and the possibilities and limits to error free transmission; channel coding; interleaving principles; linear block coding; cyclic codes; convolutional codes.
Prerequisite: EE4616

EE4816   Signals & Systems 1   (Spring/3)

4 hours per week; 13 weeks/6th semester; 26L/26LAB;ECTS credits:6

Systems signals; signal representation; system response; sampling discrete time systems.

ET4104   Electrotechnology 4*   (Spring/2)

4 hours per week; 13 weeks/4th semester; 26L/26LAB; ECTS credits:6

The magnetic circuit; B-H curves; hystersis loop; the transformer; equivalent and approximate equivalent circuit of transformer; uses a transformer; DC brush generator construction and operating principles separately excited, self excited, critical speed, critical field resistance; DC brush motor; operating principles, series and shunt connections, torque and speed for both configurations; typical applications; the production of a rotating magnetic field; the synchronous motor; the induction motor; single phase induction motors, capacitor start and shaded pole; stepping motors; their construction and operations; 3 phase power. *Prerequisite ET410*

ET4112 Outcome-based Learning Laboratory 1 (Spring/2)

4 hours per week ; 13 weeks/2nd semester ; 52LAB

Descriptive approach to real world systems, high level block diagrams. Block description specification and linking. Measuring real world signals, sensors, signal multiplexing analogue & digital, A/D, datalogging. Remote sensing, timing and control, data gathring, data on demand. Data transmission and storage on a PC, dtabases. Data display in user friendly format, graphical display and visualisation. Data access via the web, webpage development.
Prerequisite : ET4121 Laboratory Skills 1

ET4132 Introduction to Web and Database Technology (Spring/2)

4 hours per week; 13 weeks/2nd semester; 26L/26LAB; ECTS credits:6

Brief history of the Internet. Web servers: various architectures including a more detailed analysis of one web server (Apache). Web browsers and protocols. Web programming: overview of HTML, DHTML, CSS and Active S controls. Multimedia on the WWW including Audio, video and graphics. Data & Information: characteristics, differences and structures. Data management: simple file storage & retrieval. Intro to Data modelling. Intro to concept of Database Management System.

ET4142 Computer Systems Architecture 1 (Spring/2)

4 hours per week; 13 weeks/2nd semester; 26L/26LAB; ECTS credits:6
Use of a microprocessor in a computer; relationship between hardware, software and operating system; Microprocessor concepts: von Neumann computer, block diagram of microprocessor, fetch-decode-execute cycle. Memory, I/O and microprocessor, read/write cycles. Programmer's model of a simple microprocessor, using simplified 8086 as example. Registers, addressing modes (simplified) and instruction set of an 8086, including unconditional and conditional jump and branch instructions, status bits, the stack and subroutines. Evolution of Pentium from 8086. Example of an embedded system and comparison with a PC. Intro to the PC, its bus structure and relevance of the BIOS. Project work: writing simple assembly and C programs and verifying their operation; exploration of PC using 'My Computer' and other PC-based tools.
Prerequisite : ET4151 Digital Electronics 1

ET 4204 Analogue Electronics 4 (Spring/4)

4 hours per week ; 13 weeks/4th semester/26 L/26LAB ; ECTS credits : 6

The module is based on an introduction to the structure, operation and uses of the operational amplifier (op-amp) for a range of electronic voltage signal conditioning and instrumentation applications. Key topics : operational amplifier structure ; op-amp behaviour : ideal and real ; uses of op-amp in voltage amplification circuits ; electronic filters ; uses of op-amp in low-pass, high-pass and band-pass filters ; uses of p[-amp in non-linear circuits ; precision rectifier, oscillators ; structure and operation of op-amp ; construction of an Instrumentation Amplifier using the op-amp.

ET4224 Robotics 1 : Sensors and Actuators (Spring/4)

5 hours per week ; 13 weeks/4th semester/26L/26Lab/13T ECTS credits : 6

Introduction to Physical Phenomenon : SI Units ; Principles of sensor operation (mechanical, thermal, sound, light). Sensors and Transducers : concept of transducer action as signal conversion with particular emphasis on an electrical signal as the output ; the ideal transducer ; resolution, accuracy, linearity definitions and relevance ; review of some physical phenomena that result in electrical parameter variations. Sensor Interfacing Circuitry Intro : review of Op-Amp as applied to sensing systems, instrucmentation amplifiers, diff amps, etc ;

simple DACs, ADCs successive approximation and integrating, operating principles and suitability for industrial applications ; overall concepts of accuracy, drift, resolution and common mode rejection applied to a measurement system, complete system composed of a transducer, amplifier and ADC. Actuators : Magneto Motice Force & magnetic circuits, transformers, DC generators and motors ; Motors : DC machines with permanent magnet and field windings, Induction motors, Stepper Motors, Stepper drives ; Motor Drive Circuits.

ET4228 CAD/CAM Systems (Spring/4)

5 hours per week; 13 weeks/8th semester; 26L/13T/26LAB; ECTS credits:6

The CIM philosophy, designing CIM systems, systems analysis, computer based production management systems, CIM data flows; CAD/CAM principles, computer aided design and engineering, electrical/electronic drafting and design, simulation; computer aided manufacture, NC.CNC, robotics, robot and CNC machine tool programming, FMS.

ET4234 Embedded Software 2 (Spring/4)

4 hours per week; 13 weeks/4th semester; 26 L/26LAB; ECTS credits: 6

How to write, compile, link and test C programs for an embedded system. Review data storage formats (int, double, etc). Detail C programming language extensions to support embedded architecture such as memory models, bit types, reentrant functions, interrupt handling. Interface assembly and C code and mechanisms for passing parameters to functions and returning values. Intro to Lint and how to debug and simulate embedded C applications. Cover C coding guidelines and practices for embedded systems. Operation and control of hardware timers for timing, counting and delay generation. Intro to serial and parallel communication standards. Transmission/receipt of data using C with embedded hardware.

ET4244 Outcome Based Learning Laboratory (Spring/4)

4 hours per week; 13 weeks/4th semester; 52LAB; ECTS credits: 6

Prerequisite: Outcome Based Learning Lab 1.
Data acquisition and embedded systems design. Topics: modular design of real world sensing systems, top down, bottom up design; sensor selection to meet resolution, accuracy, repeatability criteria and for compatability with other sensors in the system; data transmission point to point and trough networks; data logging using microcontrollers and PCs; data manipulation and storage on a PC; data display in user friendly format, graphic displays.

ET4254 Communications and Networking 1 (Spring/4)

4 hours per week; 13 weeks/4th semester; 26L/13LAB; 13TUT;ECTS credits:6

Intro to Communications and networks. Communication system model and concepts; analogue and digital signal concepts; frequency spectrum and bandwidth. Overview of analogue and digital signals encoding and transmission; intro to sampling, quantization, PAM, PCM. Multiplexing: definition, FDM, TDM, WDM, STDM. Transmission media. Digital data transmission: parallel interfaces, serial transmission and synchronisation. Circuit switching, Packet switching. PSTN, switching concepts, routing digital hierarchies, control signalling. Modems; ISDN

overview; DSL technologies. Communications network architecture and protocols intro: OSI model, networks definitions, types LAN, MAN, WAN. Data link control: synchronous, asynchronous transmission, flow control, error control, data link protocols. Intro to Local Area Networks concepts.

ET4264 Java Programming 2 (Spring/4)

4 hours per week; 13 weeks/4th semester; 26L/26LAB; ECTS credits:6

Java programming for moderately large applications including programming design and structure. In depth study of the object oriented principles, abstraction, inheritance and polymorphism. Files and Streams. Use of the Abstract Window Toolkit to develop interactive user interfaces. Threads, multithreading and the need to develop thread safe code. Java exception and event mechanisms. Garbage collection. Use of UML in software development. Study of the support for Abstract Data types including interfaces, abstract classes.
Prerequisite: Java Programming 1

ET4274 Networks Laboratory (Spring/4)

4 hours per week; 13 weeks/4th semester; 13L/39LAB; ECTS credits:6

Signal concepts and measurement techniques. Modulation: how variation of amplitude, frequency and phase of sinusoid by an analogue or digital message signal will yield [AM, FM and PM] or [ADK, FSK and PSK] respectively. AM modulation; Circuits for generation and detection; application examples. Binary ASK generation and detection; application examples. Basic ideas about FM modulation and demodulation. Comparisons with AM in telecom quantization, PAM, PCM. Transmission media: targeted investigations into properties of guided media, unguided media; transmission impairment, performance, data rate and bandwidth; Digital data transmission: parallel interfaces, serial transmission and synchronisation. Modems.

ET 4428 Semiconductor Technology 2 (Spring/4)

6 hours per week; 13 weeks/8th semester; 26L/13T/39LAB; ECTS credits:6

Advanced processing techniques; plasma enhanced cvd; mbe; constraints in optical lithography, image reversal, DESIRE, CEL, Bilayer and Trilayer schemes; electron beam lithography; direct write, resist system, prome process technique; x-ray lithography; resist, source and masks; wafer track; dry etching; role of gas chemistry, partial pressure and input power, rf and microwave plasma discharge systems, merie, surface damage; vacuum technology; basic systems and terminology, rotary diffusion and turbomolecular pumps; measurement; optical and electrical measurement of semiconductor properties; linewidth measurement, sem, sims, srp, four point probe, and angle lapping; process simulation; numerical models and algorithms, parameter optimization, technology development, two-dimensional simulation and its impact on device simulation; topography simulation; numerical models for aerial, latent and relief image formation; process integration; bipolar, NMOS, CMOS and BiCMOS technologies, threshold control.

ET4448 Communication and Networking 4 (Spring/8)

3 hours per week; 13 weeks/8th semester; 26L/13T; ECTS credits:6

Digital mobile and personal communications systems: general configuration fo cellular systems; comparison 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, effects of Multiple Access Interference & ISI; Mobile telecommunications: current system example (eg. GSM), evolution to future systems example (eg. G3) 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, 802.11, Ultrwideband. Mobile IP, mobile TCP issues. Support for mobility at higher layers of reference model.

ET4608   Advanced Telecommunications 2 (Spring/4)
Elective module – may change at short notice
3 hours per week; 13 weeks/8th semester; 26L/13T; ECTS credits:6

Television, concepts, technology and systems; NTSC and PAL to MAC, EDTV and HDTV including interactive data broadcast systems and DBS; telemetry, telecommand and control systems; design and implementation; case studies; software support applications for telecommunication system protocol design applications, SDL applications; case studies and mini-project.

ET4628 Communications Networks 3   (Spring/4)

5 hours per week; 13 weeks/8th semester; 26L/13T/26LAB; ECTS credits:6

Communication System, Full Duplex, Half Duplex. Data Flow and Error control. Protocols and interfaces, Elements of a protocol, Parity, Checksums etc. Byte Oriented Protocols, Bit Oriented Protocols. Protocol selection, TCP/IP, Interconnect methods, interworking. Network security, encryption, security protocols, security risks, and firewalls.

ET4702   Computing Software 1* (Spring/1)

4 hours per week; 13 weeks/2nd semester; 26L/26LAB; ECTS credits:6

Algorithms and problem solving; from algorithms to Programs; overview of C; C program development environments.

ET4718 Computer Programming 7 (Spring/4)

4 hours per week; 13 weeks/8th semester; 26L/26LAB; ECTS credits:6

Advanced Java for 'programming in the large': access modifiers; packages and interfaces. Structured exception handling in Java: throw and catch. Threads and concurrency revisited: the Java multithreading model, race conditions and synchronisation. Java streams and input/output handling: object serialisation. An introduction to Java packages, taking as example the Java Beans application programming interface. Java security mechanisms: the Java Virtual Machine and class verification. An introduction to Software Engineering. The problems encountered in developing large-scale software systems. The software life cycle. Software development models. Software maintenance. Software project planning. Software testing. *Prerequisite Comp. Prog. 6*

ET4725 Operating Systems 1 (Spring/3)

4 hours per week; 13 weeks/5th semester; 26L/26LAB; ECTS credits:6

Processes: Concurrency, states, queues, scheduling, real-time scheduling. Process Communication: Mutual exclusion, race conditions, busy-waiting solutions, TSLs, semaphores, monitors, simple message passing, classical problems. Memory Management: Swapping, virtual memory, paging, segmentation, performance and protection issues. File systems to support multitasking: File sharing, file protection, performance issues. The UNIX i-node system, file I/O management. Security & Protection: User authentication, protection matrix; ACL. Deadlock: Conditions for deadlock and solutions. Input/Output: I/O devices for multi tasking environments.

ET4808 Advanced Graphics & Display Systems (Spring/4)
Elective module – may change at short notice
5 hours per week; 13 weeks/8th semester; 26L/13T/26LAB; ECTS credits:6

Introduction; viewing in two dimensions; homogeneous coordinate systems, matrix transformations; clipping algorithms; advanced programming under a graphical user interface; x windows; the client-sever network graphics model; using the x window system; event driven programming; applications programming; viewing in three dimensions; homogeneous coordinate systems and matrix transformations in three dimensions; polygon meshes (wire-frame representations); digital image formats; advanced image database systems; two-dimensional, three-dimensional and moving picture systems; applications development of image based systems and examples. *Prerequisite: ET4805*

ET4818   Digital TV (Spring/4)
Elective module – may change at short notice
4 hours per week; 13 weeks/4th semester; 26L/26LAB; ECTS credits:6

To introduce students to television systems, both monochrome and colour. To introduce the concept of digitalisation of video signals and the principles of data compression.

MA4002 Engineering Mathematics 2* (Spring/1)

3 hours per week; 13 weeks/2nd semester; 26L/13T; ECTS credits:6

The indefinite integral; the definite integral; areas, lengths, surface areas, volumes and moments of inertia; numerical integration; ordinary differential equations; laplace transform; application of the method to the solution of linear ordinary differential equations; functions of several variables and partial differentiation. *Prerequisite MA4001*

MA4004 Engineering Mathematics 4   (Spring/2)

3 hours per week; 13 weeks/4th semester; 26L/13T; ECTS credits:6

Variables - disrupt and continuous; the distribution of a variable; basic concepts of probability; Baye's Theorem; discrete and continuous random variables; special discrete probability distributions; moment generation functions; transformations; statistical inference - estimation and hypothesis testing; properties of estimates; maximum likelihood, method of least squares, linear regression.

MA4006 Engineering Mathematics 5* (Spring/3)

3 hours per week; 13 weeks/6th semester; 26L/13T; ECTS credits:6

Laplace transforms; transform theorems; convolution; the inverse transform; Fourier Series; Fourier transforms; linear partial differential equations; solution by separation of variables, and by integral transform methods; numerical methods; finite differences and finite elements; vector calculus; maxima and minima lagrange multipliers; line, surface and volume integrals *Prerequisite MA4002*

MA4016 Engineering Mathematics 6   (Spring/3)

4 hours per week; 13 weeks/6th semester; 39L/13T; ECTS credits:6

Mathematical logic; concepts of proof and program correctness; sets; relations, functions; recursive definition of functions; difference equations; algorithms and analysis of algorithms; number systems; finite state machines, computability.

MA4102 Business Mathematics 1 (Spring/1)

3 hours per week; 13 weeks/2nd semester; 26L/13T; ECTS credits:6

Algebra: linear equations and inequalities, real numbers, function and their graphs; exponential and logs, polynomials; laws of indices, matrices and linear systems, linear programming, mathematics of finance, present value, sinking funds; deferred and complex annuities; data reduction and representation; coefficient of variation, probability concepts, discrete and continuous probability distributions; sampling and sampling techniques; relationship between sample data and population.

MA4104 Business Statistics   (Spring/2)

3 hours per week; 13 weeks/4th semester; 26L/13T; ECTS credits:6

Hypothesis testing for large and small samples using proportions and averages; simple linear regression and an introduction to multiple linear regression; dummy variables in regression and regression analysis for prediction utilising confidence intervals; test of variances; non parametric hypothesis testing, chi-square and contingency tables, time series and index numbers - seasonal cyclical and irregular component analysis; forecasting techniques trend - bases and regression based methods; introduction to Box-Jenkins forecasting. *Prerequisite MA4102*

MA4128   Advanced Data Modelling (Spring/4)

3 hours per week; 13 weeks/8th semester; 26L/13T; ECTS credits:6

Cluster analysis, principle component analysis, factor analysis, dicriminant analysis, the generalised linear model, maximum likelihood estimation, logit and probit regression, log linear models for categorical data. *Prerequisite: MA4125*

MA4602 Science Mathematics 2*   (Spring/1)

3 hours per week; 13 weeks/2nd semester; 26L/13T; ECTS credits:6

Functions of the calculus; curve sketching; integration and applications; series; partial derivatives. *Prerequisite MA4601*

MA4604   Science Mathematics 4* (Spring/2)

3 hours per week; 13 weeks/4th semester; 26L/13T; ECTS credits:6

Modelling with differential equations. Derivation of differential equations of exponential growth and decay. Application to population growth, radioactive decay and other problems from science and engineering. Ordinary differential equations First order equations of variables separable, homogeneous and linear types; Second order homogeneous equations with constant coefficients. Numerical solutions of ordinary differential equations by Euler's method and Runge-Kutta methods. Fourier Series Review of periodic functions; Fourier Series of functions of period and arbitrary periods; Fourier series of even and odd functions; applications to solving second order linear constant coefficient ordinary differential equations with periodic input. Laplace and Fourier Transforms definition of Laplace transform; transforms of elementary functions; tables of transforms;inverse Laplace Transform; convolution; solution of linear constant coefficient ordinary differential equations with applications to physics and chemistry (e.g. LCR circuits, damped mass spring, reaction rates); Heaviside unit step function and transforms of piecewise continuous functions; Fourier transform and its relation to the Laplace transform. *Prerequisite MA4613*

MA4702 Technological Maths 2*   (Spring/1)

3 hours per week; 13 weeks/2nd semester;26L/13T; ECTS credits:6

Functions of the calculus; curve sketching; series; integration and applications; partial derivatives. *Prerequisite MA4701*

MA4704 Tech Mathematics 4* (Spring/2)

3 hours per week; 13 weeks/4th semester;26L/13T; ECTS credits:6

Variables; representation of variables; introduction to the fundamentals of probability; Baye's theorem; special distributions; binomial, Poisson, geometric, uniform, exponential, normal; statistical inference; non-parametric tests; correlation and regression. *Prerequisite MA4701*

MA4708 Quality Control*+   (Spring/4)

3 hours per week; 13 weeks/8th semester;26L/13T; ECTS credits:6

History and development of quality control; cost of quality; statistical process control; attribute data; machine capability tests; acceptance sampling; introduction to design of experiments and analysis of variance. *Prerequisite MA4704*

MA4802 Business Mathematics 1 (Spring/1)

Review of algebra: linear equations and inequalities, real numbers, functions and their graphs; exponential and logs, polynomials; laws of indices, matrices and linear systems, linear programming, mathematics of finance, present value, sinking funds; deferred and complex annuities, data reduction and representation, measure of location and dispersion for grouped data, coefficient of variation, probability concepts, discrete and continuous probability distributions especially binomial, poison, geometric, normal, exponential and uniform; concepts of sampling and sampling techniques; relationship between sample data and population.

MB4002 Algebra 2* (Spring/1)

3 hours per week; 13 weeks/2nd semester; 26L/13T; ECTS credits:6

Mathematical logic; sets; set operations; relations; mappings; matrix representation; algebra of sets; simple applications to switching theory. *Prerequisite MB4001*

MB4004 History and Foundations of Maths* (Spring/2)

3 hours per week; 13 weeks/4th semester;26L/13T; ECTS credits:6

Contribution of early civilisations; the Hindus and Arabs; Hindu number system, zero, place value; early and medieval Europe; renaissance mathematics, 1500 - 1800; development of algebra, logarithms, co-ordinate geometry, calculus 1800-present; logic; proof and proof techniques; axiom systems; sets; transfinite arithmetic; real number system; complex numbers; groups; basic ideas. *Prerequisite MA4702*

MB4008 Group Theory (Spring/4)

3 hours per week; 13 weeks/8th semester; 26L/13T; ECTS credits:6

Sets and operations; groupoids and semi-groups; groups; Lagrange's theorem; Sylow's theorems; group of isometries; group of similarities; rings; integral domain, fields. *Prerequisite MB4001*

MB4018 Differential Equations*   (Spring/4)

3 hours per week; 13 weeks/8th semester; 26L/13T; ECTS credits:6

Basic concepts; problem solving and modelling; differential equations as models; classical mechanics; Newton's laws; simple harmonic motion; projectile motion; first order differential equations; applications; second order differential equations; trial solutions; d-operator techniques; applications; numerical solution techniques. *Prerequisite MA4702*

MS4008 Maths Methods 2* (Spring/4)

3 hours per week; 13 weeks/8th semester; 26L/13T; ECTS credits:6

Finite difference methods; elliptic problems; parabolic problems; hyperbolic; finite element method. [Abstract notions of Vector Space axioms, linearity, linear transformations *Prerequisite MS4007*

MS4014 Introduction to Numerical Analysis (Spring/2)

3 hours per week; 13 weeks/4th semester; 26L/13T; ECTS credits:6

Propagation of floating point error. Zeros of non-linear functions; bisection method, Newton's method, secant method, fixed point method, convergence criteria, rate of convergence, effect of multiplicity of zero, introduction to the use of Newton's method for systems of non-linear 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 Quadarature; 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, and application to systems of ordinary differential equations.

MS4022   Calculus 2   (Spring/1)

5 hours per week; 13 weeks/2nd semester; 39L/13T/13LAB ; ECTS credits:6

Mclaurin and Taylor series, order notation bit 'oh', litle'oh', asymptotic equivalence, taylors theorem and remainders, applications indefinite integral, integration of standard functions, techniques including integration by parts, substitution and partial fractions definite integrals the limit of a riemann sum, fundamental theorem of calculus, leibniz's rule for differentiating under the integral sign introduction to ordinary differential equations. Definition of an ODE, linearity, homogeneity, first order variables separable solution technique by integration first order linear equations by integrating factor, basic second order liner homogeneous odes introduction to functions of two real variables continuity, partial derivatives and their geometrical interpretation, conditions (without proof) for maximum, minimum, saddle-point.

MS4102   Liner Algebra 1   (Spring/1)

4 hours per week; 13 weeks/2nd semester; 26L/13T/13LAB ; ECTS credits:6

Vectors in Rn and general vector spaces; matrices; systems of linear equations and solution of such by matrix means; eigenvalues and eigenvectors; applications of linear algebra in graph theory, coding theory and computer graphics. *Prerequisite: MS4111*

MS4108 Discrete Maths 3*   (Spring/4)

3 hours per week; 13 weeks/8th semester; 26L/13T; ECTS credits:6

Instantaneous and block codes; rings of polynomials; vector spaces over finite fields; hamming distance, error detection, error correction and nearest neighbour decoding; linear codes; dual codes; perfect codes; cyclic codes; decoding algorithms. *Prerequisite MS4102*

MS4111   Discrete Mathematics 1 (Spring/1)

3 hours per week; 13 weeks/1st semester; 26L/13T; ECTS credits:6

Mathematical logic; Boolean algebra; number systems; algebraic structures; relations.

MS4212 Introductory Data Analysis   (Spring/1)

3 hours per week; 13 weeks/2nd semester; 26L/13T; ECTS credits:6

Collecting data: sampling,; experimentation; measurement. Descriptive Statistics: frequencies; histogram; percentiles; mean, median, mode; range, interquartile range, standard deviation, boxplot. Cross-classification: row percentages, column percentages, Simpson's Paradox. Scatterplots: least squares line, transforming to linearity, correlation. The Normal Curve: using a normal curve to approximate a histogram, calculations using the normal curve, normal probability plot , transforming to normality. The Sampling Distribution of a mean: illustrate by Monte Carlo, use for sample size determination, confidence intervals and hypothesis testing.

MS4214 Statistical Inference   (Spring/2)

3 hours per week; 13 weeks/8th semester; 26L/13T; ECTS credits:6

The notion of the probability model: examples, the need for estimation, confidence intervals and hypothesis tests. Inference for normal data : chi-squared, t, F, confidence intervals, hypothesis tests, two means and two variances. Central Limit Theorem : normal approximation to the binomial, application to inference for a single proportion and the difference between proportions, the chi-squared test for independence. The likelihood function : the maximum likelihood estimate(MLE), iterative methods for calculating MLE. Repeated sampling properties : bias, variance, mean squared error, Cramer-Rao theorem, efficiency, the large sample behaviour of maximum likelihood estimates. Interval estimation : pivotal quantities , confidence intervals, approximate confidence intervals based on the MLE. Hypothesis testing : test statistic, Type 1 and Type 2 errors, power function, the likelihood ration test

MS4303 Operations Research 1 (Spring/2)

3 hours per week; 13 weeks/3rd semester; 26L/13T; ECTS credits:6

Model building and the methods of operational research; linear programming transportation and assignment algorithms; linear programming in practice; critical path analysis; decision analysis.

MS4308 Optimisation & Control 2   (Spring/4)

3 hours per week; 13 weeks/8th semester; 26L/13T; ECTS credits:6

The concept of state: the state equation and its solution. State transformations. Controllability. Observability. Stability and Lyapunov's approach. Feedback control (Pole placement, Observers, Decoupling). System identification, parameter estimation, regression methods. Optimal control: Linear systems with quadratic criteria, Pontryagin's Principle, Bang-Bang controls, Dynamic Programming.

MS4404 Partial Differential Equations (Spring/2)

3 hours per week; 13 weeks/4th semester; 26L/13T; ECTS credits:6

Introduction to PDEs, Wave equation, Laplace's equation, Diffusion equation, first order PDEs.

MS4414 Theoretical Mechanics   (Spring/2)

3 hours per week; 13 weeks/4th semester; 26L/13T; ECTS credits:6

Kinematics. Dynamics. Work, Energy, Power, Systems of particles, Rotational Dynamics, Oscillatory Motion and Waves, Mechanical Properties of Matter. *Prerequisite Vector Calculus, ODEs*

TA4002 Introduction to Science & Technology 2 (Spring/1)

3 hours per week; 13 weeks/2nd semester; 26L/13T; ECTS credits:6

Chemistry – discovery of the elements; the periodic table; materials and bonding; chemistry of life; cleaning – detergents and solution; raw materials to products; agriculture and food – food cycles, oxygen, carbon dioxide and nitrogen cycles; nutrition, preservation, pasteurisation and fermentation; evoltion of agriculture and agriculturally

based industries; Environment – the ecosystem, atmosphere, water, ozone layer depletion; conversation and recycling; biotechnology – the chemistry of DNA and DNA replication; structure of RNA and the genetic code; cloning and genomic libraries; DNA fingerprinting; health and leisure – disease and epidemics; diagnostic devices and health technologies; concepts of fitness, aerobics and performance; technology in entertainment; new materials and sports equipment. *Prerequiiste TA4001.*

TA4004 Introduction to Science & Technology 4 (Spring/3)

3 hours per week; 13 weeks/4[th]semester; 26L/13T; ECTS credits:6

Characteristics of a scientific theory; modelling versus explanation, prediction. Evolution of contemporary philosophy of science from Aristotle via Galileo to Popper and Kuhn. Innovation and design; the specification and design criteria, functionality, economics, ergonomics, cost and performance. Brainstorming as a creative tool. Innovation in industry and its management. *Prerequiiste TA4003.*

Engineering Modules

ID4112   Design Mechanics* (Spring/1)

4 hours per week; 13 weeks/2nd semester; 26L/26LAB; ECTS credits:6

Mechanical elements; shafts, bearings, gears, power screws, belt and chain drives; structures; types of structures; simple stress/strain relationship in shear and direct form; finite element methods; illustration of techniques and their implications; demonstration of plane stress and framework (case study).

ID4812   Industrial Design 2 (Spring/1)

6 hours per week; 13 weeks/2nd semester; 13L/26T/52LAB; ECTS credits:6

A continuation of ID4811 consisting of design projects, an introduction to presentation drawing, an introduction to ergonomics. Freehand drawing is continued and history of design is taught in the form of an essay.

IE4214   Industrial Organisation + (Spring/2)

3 hours per week; 13 weeks/4th semester; 26L/13Lab; ECTS credits:6

Production planning: types of manufacture, resources (4 Ms), bill of materials, routing, layout by templates and string diagrams, quality system; organisational functions; determining functions, grouping, integration, alternative structures; estimating; types of cost, cost elements, use of time data, final cost/selling price, break-even; project planning; Gantt, networks, critical path, uncertain times, resource levelling, time-cost trade-offs, line-of-balance; inventory control; pareto analysis, ABC, EOQ, Little's law, JIT; executing plans; dispatching expediting, push/pull, planned review.

IE4218   Operations Management 2   (Spring/4)

3 hours per week; 13 weeks/8th semester; 26L/13T; ECTS credits:6

Evaluations; value analysis, job evaluation, operator ratings; decision theory; tables and trees, descounted decision trees; decision making under certainty, risk and uncertainty; optimisation; response surface analysis, steepest ascent/descent, Fletcher-Powell plane-cutting, Rosen Brock star-search, golden section, Hooke & Jeeves; case studies; each examined from aspects such as facility location, scheduling, ergonomics, materials handling; each specialist assesses the case from his/her particular viewpoint; students work in groups; on their own under the guidance of different specialists; verbal presentations and written reports.

IE4224   Supply Chain Modelling (Spring/2)

4 hours per week; 13 weeks/4th semester; 26L/26LAB; ECTS credits:6

Production Planning: parts explosion, Bill of Materials, aggregation of requirements, effects on vendors. Inventory models: single item static, price breaks, multiple items, N-period dynamic models, Wagner-Whitin, production scheduling. Probabilistic models: continuous review, single period models, multi-period models. Effects of feedback: fluctuating demands/supplies, ramp changes, amplification. Distribution issues: location, what to produce & where, Push vs pull, transport/buffers problems, network flows, rough cut methods, multi-echelon models. Interrelationships: transportation, inventory, customer service.

IE4238   Operations Analysis AM (Spring/4)

5 hours per week; 13 weeks/8thsemester; 39L/26T; ECTS credits:6

Linear programming; Introduction to integer programming; application of linear programming; project work.

IE4248   Project Planning and Control (Spring/4)

Project planning: networks; work breakdown structures (wbs), job ordering procedures, multiple projects, concurrent engineering: milestones, review points and slip charts: project life cycles: from concept through design-validation-production-service; support and disposal: computer programs for project management. [p] Man management: effective communications, cross-functional experience; relationships, organisational make-up, change management. Cost estimation for products; projects: estimating resource, time; cost requirements and constraints: life cycle costs, detailed; parametric cost estimating models, 3-estimate method: opportunity costs of project delays: budget determination, opening; maintaining accounts: basic profit; loss determination.

IE4368   Plant and Process Management 1 (Spring/4)

3 hours per week; 13 weeks/8th semester; 26L/13T;ECTS credits:6

Reliability engineering; fundamentals, implications on costs, operation and maintenance; maintenance planning; determination of repair times, plant availability calculations, replacement decisions; plant location; factors, comparison techniques; plant layout systematic layout planning; plant scheduling; project planning and control; critical path methods; loss prevention.

IE4417   Ergonomics (Spring/4)

3 hours per week; 13 weeks/7th Semester; 26L/13LAB; ECTS credits:6

Ergonomics approach; muscular stress; energy liberation, circulatory system, physical work ability, muscle contractions; work activity; measuring energy cost, pimental and Pandolf equations, manual materials handling, NIOSH guidelines; information exchange; information theory, information processing, controls and console design; postures; anthropometrics, static work, posture description, posture improvement, cumulative trauma disorders; hand tools; design, problems, vibration white finger; systems environment ; heat accumulation, Givoni and Goldman equations, lighting terms and requirements, noise effects and countermeasures; systems safety.

IE4518   Engineering Psychology (Spring/4)

3 hours per week; 13 weeks/8th semester; 26L/13LAB;ECTS credits:6

Ability assessment; reliability and validity of tests, situational specificity, information theory, attention and perception; training; learning, educational and training, memory, designing a training programme and developing materials; testing a programme; training methods, assessing trainability, evaluating training programmes; decision making; information processing models of

decision-making, feedback, hypothesis testing, diagnosis and forecasting, decision-making aids; human-machine interaction.

IE4712   Operations Integration (Spring/1)

4 hours per week; 13 weeks/2nd semester; 26L/26LAB;ECTS credits:6

Data capture from metrology equipment and bar code readers; tooling management using database techniques; control of stepping motors and programmable logic controllers; integration with other software applications; on-line capture of timing, inventory, posture or heart rate data.

ME4112 Engineering Mechanics 2*   (Spring/1)

4 hours per week; 13 weeks/2nd semester; 26L/26LAB; ECTS credits:6

Application of Newton's laws to particles and rigid bodies in equilibrium (dynamics); kinematics of particles, Cartesian, polar, normal and tangential co-ordinates; kinetics of particles, work, kinetic energy, potential energy, impulse and momentum; kinetics of systems of particles; rigid bodies in plane motion, motion relative to rotating axes, mechanisms; rigid bodies in three-dimensional motion, Euler's equations of motion, gyroscopes.

ME4116 Aircraft Vibrations   (Spring/3)

3 hours per week; 13 weeks/6th semester; 26L/13T; ECTS credits:6

Oscillatory motion; free vibration of single degree of freedom systems; harmonically excited vibration; transient vibration; transient vibration; systems with two or more degrees of freedom; vibration of continuous systems; sources of aircraft vibrations; flutter and aero elasticity; control of aircraft vibrations.

ME4168   Engineering Science (Ed)* (Spring/4)

4 hours per week; 13 weeks/8th semester; 26L/13T/13LAB;ECTS credits:6

Velocity of mechanisms, balancing of static and dynamic systems; gyroscopic effects; friction drives and braking systems; vibration; constant volume and constant pressure processes; isothermal, adiabatic; heat engine cycles; reciprocating IC engines; engine and vehicle performance criteria; steam plant the enthalpy; entropy chart, boiler and associated plant; applications of fluid dynamics; operation and performance of pumps and turbines.

ME4216   Aircraft Structures 1* (Spring/3)

3 hours per week; 13 weeks/6th semester; 26L/13LAB; ECTS credits:6

Aircraft structural design/analysis philosophies, construction principles: aircraft loads; theory of elasticity with applications to plane stress problems; airy stress function; non-homogeneous, non-symmetric beams subjected to bending about two axes; torsion of open and closed sections, prandt stress function, membrane analogy, Bredt-Batho theory applied to single and mult-cell sections; shear of thin-walled beams; shear walled cross-sections; idealised stringer-web, mult-cell, thin-buckling; introduction to buckling o f stiffened panels.
Prerequisite ME4213

ME4218 Mechanics of Solids 4 (Spring/4)

4 hours per week; 13 weeks/8th semester; 26L/26LAB; ECTS credits:6

Creep, recovery and stress relaxation of viscoelastic materials, fatigue and impact behaviour of plastics, design methods for plastics; elastic properties of composite materials: unidirectional laminae, laminate theory, short fibre composites, thermal stresses, strength of composites.

ME4226 Mechanics of Solids 2 (Spring/3)

4 hours per week; 13 weeks/6th semester; 26L/26LAB; ECTS credits:6

Infinitesimal strain at a point in two dimensional stress field and Mohr's strain circle; selection of strain gauges for measurements on metals, thin circular plates, criteria of failure for isotropic homo; materials (rankline, tresca and von-mises), deflection of beams, buckling of struts and plates, thick cylinders, linear elastic fracture mechanics, fatigue. *Prerequisite: ME4213*

ME4238 Maintenance Technology (Spring/4)

4 hours per week; 13 weeks/8h semester; 26L/26T ECTS credits:6

Failure in service; influence of design, manufacturing and materials; non-destructive test procedures; analysis and characteristics of defects, validation of results; repair procedures for metallic and composite structures in aircraft; life of lubricants, hydraulic fluids and bearing materials; actuation systems, pneumatic and electric; test procedures for avionics systems.

ME4312   Fluid Mechanics 1   (Spring/1)

4 hours per week; 13 weeks/2nd semester; 26L/26LAB; ECTS credits:6

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.

ME4328 Aircraft Maintenance (Spring/4)

4 hours per week; 13 weeks/8th semester; 26L/26T; ECTS credits:6

Aircraft maintenance; philosophy of maintenance, inspection schedules, regulatory requirements (JAR, FAR), condition monitoring, durability and reliability of materials and components, traceability of materials and components and ageing aircraft programmes. Introduction to the failure effects and reliability of aircraft systems. Aircraft repair and inspection; causes and mechanisms of corrosion, non destructive testing (NDT) techniques and procedures, analysis and design of repair procedures for both metallic and composite structures.

ME4412   Fluid Mechanics 1 (Spring/1)

4 hours per week; 13 weeks/2nd semester; 26L/26LAB; ECTS credits:6

Characteristics and Properties of Fluids. Fluid Static's 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.

ME4414   Fluids 1 (Spring/2)

3 hours per week; 13 weeks/6th semester; 26L/13T; ECTS credits:6

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. *Prerequisite ME4313*

ME4424   Aerodynamics 1* (Spring/2)

3 hours per week; 13 weeks/4th semester; 26L/13LAB;ECTS credits:6

Review of governing equations; potential flow, stream function, complex potentials; thin aerofoil theory; boundary layer separation and control; compressible flow, normal and oblique shock waves; introduction to experimental techniques.
Prerequisite ME4313

ME4428   Aerodynamics 2 (Spring/4)

4 hours per week; 13 weeks/8th semester; 26L/26Lab; ECTS credits:6

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

ME4438   Computational Fluid Dynamics (Spring/4)

4 hours per week; 13 weeks/8th semester; 26L/26Lab; ECTS credits:6

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

ME4516 Thermodynamics 1*   (Spring/3)

4 hours per week; 13 weeks/6th semester; 39L/13LAB;ECTS credits:6

Axial and radial flow turbines and compressors; reciprocating expanders and compressors; vapour power cycles; gas turbine cycles; introduction to combustion theory; performance of internal combustion engines.
Prerequisite ME4313

ME4526 Introduction to Heat Transfer* (Spring/3)

3 hours per week; 13 weeks/6th semester; 26L/13T; ECTS credits:6

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 correlations 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.
Prerequisite ME4312

ME4536   Thermodynamics and Heat Transfer (Spring/3)

5 hours per week; 13 weeks/6th semester; 65L; ECTS credits:6

vapour power cycles refrigeration and heat pump cycles Reciprocating expanders and compressors Fouriers law of heat conduction the convection equation thermal resistances's and their application forced convection: standard heat transfer correlations and their application introduction to thermal radiation

ME4616 Finite Element Analysis*   (Spring/3)

4 hours per week; 13 weeks/6th semester; 39L/13LAB; ECTS credits:6

Introduction; general concepts; truss analysis; two-dimensional field problems; plane stress and plane strain; implementation of the finite element method; mesh design; pre-processing and sutomatic mesh generation; pre-solution checks; solution methods; ill-conditioning; post-processing and computer graphics; validation of the finite element software; interpolation functions and the convergence of the solution.

ME4662 Computing 2 (Spring/1)

4 hours per week; 13 weeks/2nd semester; 26L/26LAB;ECTS credits:6

Intrinsic functions; Array computations; Data analysis functions, Random numbers, Plotting: X-Y & polar plots, bar graphs, plotting options. Matrix computations; 3-D plots; Numerical Techniques: systems of linear equations, interpolation and curve fitting, polynomial analysis. Graphical User Interface(GUI). Process modelling ; introduction to SIMULINK, and it's application to process systems simulation.

ME4714 Instrumentation and Control (Spring/2)

3 hours per week; 13 weeks/4th semester; 26L/13LAB;ECTS credits:6

Sensors, transducers and transmitters; instrument specification; standard instrumentation signal levels; signal transmission; dynamic errors; open and closed loop control systems; control systems components; block diagrams and transfer functions standard process inputs; dynamic response of first order systems.

ME4716 Control Engineering 1*   (Spring/3)

3 hours per week; 13 weeks/6th semester; 26L/13T; ECTS credits:6

Introduction to control systems and automation; programmable controller's hardware and software; control program development; sequential control; interfacing external devices; PLC communications; PLC applications; selection ,installation and commissioning of PLC systems; supervisory computer control; sampling and filtering of continuous measurements.
Prerequisite ME4714

ME4718 Fluid Process Control (Spring/4)

4 hours per week; 13 weeks/8th semester; 26L/26LAB; ECTS credits:6

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. *Prerequisite: ME4714*

ME4726 Flight Mechanics* (Spring/3)

4 hours per week; 13 weeks/6th semester; 39L/13T; ECTS credits:6

Atmospheric models, standard atmosphere, thrust and drag characteristics; aircraft performance: steady flight, climbing, turning, range and endurance, takeoff and land; energy methods, specific excess power; longitudinal static stability: stick fixed and stick stability margins; longitudinal control, hinge moments, manoeuvre margin; lateral and directional static stability and control; dynamic stability: equations of motion, stability derivatives, stability modes, flying qualities; in-flight assessment of aircraft performance and stability characteristics in an instrumented aircraft.
Prerequisite ME4424

ME4814 CAD 1* (Spring/2)

3 hours per week; 13 weeks/4th semester; 26L/13LAB; ECTS credits:6

Overview of hardware and software fundamentals; introduction to 2D and CAD; introduction to isometric and 3D wire frame drawings; menu and command editing, macro writing in auto lisp / ADS.

ME4818 Mechanical Design + (Spring/4)

3 hours per week; 13 weeks/8th semester; 26L/13LAB; ECTS credits:6

Integration of machine elements into design; overview of common engineering materials and their functional properties; review of steels and heat treatment processes relevant to transmission design; practical aspects of stress analysis; review of the history of gear design showing the relationship to fatigue theory; advantages of helical and spiral bevel gears in relation to noise, wear and strength; clutches and brakes - selection considerations; electric motors - types and control options; starters and protection devices; design for fatigue life use of fatigue data, load and environment factors in design and selection; pressure vessel design use of standards.

ME4826 Aircraft Design (Spring/3)

4 hours per week, 13 weeks/6th semester; 26L/26T; ECTS credits:6

Aircraft design process, phases of design projects. Design aspects of the airworthiness regulations (JAR, FAR), aircraft certification. Aircraft loads limit and ultimate loads, flight envelope, construction of V-n diagram. Structural design and analysis philosophies, material design allowable, reserve factors, construction principles, fail-safe, safe-life philosophies. Wing lift distribution, shear force, bending moment and torsional load distribution. Design of structural components for ultimate failure and fatigue. Fasteners and structural joints. Aircraft design practise, drawings, lofting, standard hardware. Aircraft component manufacture and assembly.

ME4838 Production Design and Development 2*+ (Spring/4)

4 hours per week; 13 weeks/8th semester; 13L/39T; ECTS credits:6

Students will be required to work in small groups with a single new product/process as the focus for materials, mechanical and production engineering.

MF4718 Plant Reliability and Maintenance (Spring/4)

4 hours per week; 13 weeks/8th semester; 39L/13T; ECTS credits:6

Fundamentals; concepts and formulae, hazard rate calculations, use of redundancy and considerations of implications on costs of purchase, operation and maintenance, system reliability using block diagram reduction and state transition analysis techniques; reliability estimation; from observed failure characteristics, use of Weibull Hazard Plotting for censored date, Markov analysis including systems subject to repair; systems availability; prediction of repair times; part failure rate analysis; data sources, failure modes, effects and criticality analysis influence of environment and operational modes, identification of areas for effort; load-strength relationships and application of simulation; case study; acceptance testing for reliability, confidence levels; environmental testing; methods and instrumentation, effects of heat, humidity, corrosion, mechanical hazards; packaging.

MF4712 Operations Integration* (Spring/1)

3 hours per week; 13 weeks/2nd semester; 13L/26LAB; ECTS credits:6

By the end of this module students will be able to write programs to capture, manipulate and present manufacturing and operations engineering data through a high level language such as Visual Basic and to write programs to interface with manufacturing equipment.
Prerequisite IE4711

MF4714 Operations Management 1 (Spring/3)

3 hours per week; 13 weeks/4th semester; 13L/26T; ECTS credits:6

To introduce the subject of operations management, differentiating between operations and processes. To introduce performance optimisation within limited system resources and to prepare students for coop.

MF4716 Operations Management 2* (Spring/3)

4 hours per week; 13 weeks/6th semester; 26L/26T; ECTS credits:6

To give students an understanding of the use of analytical models in the management of resources and to provide students with skills for the application of linear programming and related models to resource management.
Prerequisite MF4714.

MF4718 Plant Reliability & Maintenance* (Spring/4)

3 hours per week; 13 weeks/8th semester; 13L/26LAB; ECTS credits:6

To give students an understanding of the principles of reliability evaluation and the influence on maintenance

strategies, costs and replacement decisions. *Prerequisite MF4727.*

MF4722   Drawing and CAD* (Spring/1)

4 hours per week; 13 weeks/2nd semester; 13L/39LAB; ECTS credits:6

To develop the students' communication, visulaisation and draughting capabilities. Acquire a good working knowledge of 2D Autocad and apply this to communicating design solutions and engineering details and to generate solutions to design problems and present design ideas/solutions using appropriate presentation techniques including computer graphics. *Prerequisite MF4111.*

MF4724   Machine Design * (Spring/2)

4 hours per week; 13 weeks/4th semester; 39L/13LAB; ECTS credits:6

To develop in the students the ability to produce high quality engineering drawings on a CAD system. To apply correct design principles to engineering components and to devlop a knowledge of Jig and Fixture design for Manufacturing Systems. *Prerequisite MF4722.*

MF4726   Discrete Event Simulation* (Spring/3)

4 hours per week; 13 weeks/6th semester; 13L/39LAB; ECTS credits:6

To give students an understanding of the techniques of simulation and it's application to systems design and to develop skills to carry out a simulation project. *Prerequisite MF4714*
N.B. It should be noted that exchange students may participate in the theoretical part of this programme but not in the flight laboratory, unless there is space, ie seating availability on the flight.

MF4728 Occupational Psychology (Spring/4)
4 hours per week; 13 weeks/8th semester; 26L/26T; ECTS credits:6

To acquaint the student with the wider context in which he or she will be working. They will, for example, need management skills.

MF4734   Measurement & Quality Systems* (Spring/2)

4 hours per week; 13 weeks/4th semester; 26L/26LAB; ECTS credits:6

By the end of the module students will be able to appreciate the importance of measurement standards and systems; apply sound principles to a variety of measurement requirements; understand and apply scientific principles to the analysis of manufacturing data and use the results of the analysis to identify areas that need improvement. *Prerequisite MF4722.*

MF4736   Engineering Economy* (Spring/3)

4 hours per week; 13 weeks/6th semester; 26L/26LAB; ECTS credits:6

To examine standard approaches to evaluating the relative economic benefit between alternative engineering capital investment proposals. *Prerequisite MF4714.*

MF4738   Production Engineering 2* (Spring/4)

4 hours per week; 13 weeks/8th semester; 26L/26LAB; ECTS credits:6

To introduce the student to the analytical aspects of cutting and forming of engineering materials with particular emphasis on material removal by the cutting process. *Prerequisite MF4746.*

MF4746 Production Engineering 1* (Spring/3)

4 hours per week; 13 weeks/4th semester; 26L/26LAB; ECTS credits:6

To develop expertise in the design of press tools, diecasting and injection mould tooling. *Prerequisite MF4724.*

MF4756 Product Design & Modelling* (Spring/3)

4 hours per week; 13 weeks/6th semester; 52LAB; ECTS credits:6

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; will understand the concepts and practices associated with computer modelling and visualisation technology; will 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 and to develop cognitive modelling/visualisation, problem solving and decision making skills. *Prerequisite MF4722.*

MF4758 Material Forming 2* (Spring/4)

6 hours per week; 13 weeks/8th semester; 26L/52LAB; ECTS credits:6

To develop an understanding of the concepts of non linear FEA with particular emphasis on Manufacturing Processes and to apply these concepts to manufacturing case studies. *Prerequisite MF4747.*

MF4766 Automation Engineering 1* (Spring/3)

4 hours per week; 13 weeks/6th semester; 26L/26LAB; ECTS credits:6

To introduce the student to sensors and pneumatic applications in automation; to introduce the student to basic process control and to indexing and feeding systems as used in manufacturing. *Prerequisite MF4724.*

MF4768 Ergonomics* (Spring/4)

3 hours per week; 13 weeks/8th semester; 13L/26LAB; ECTS credits:6

To extend earlier work in design and layout of workplaces and to study the topics of person/machine interface design and workplace design from an ergonomics viewpoint. To counter the effects of adverse industrial environments and to reduce error rates and accidents. *Prerequisite MA4004.*

MT4004 Materials Process Engineering/ Polymers* (Spring/4)

3 hours per week; 13 weeks/4th semester; 26L/13T; ECTS credits:6

The general principles of polymer processing; flow in liquids, drag flow and pressure flow, Newtonian and non Newtonian behaviour; flow behaviour of polymer metals;

extrusion of polymers; injection moulding; blow moulding; rotational moulding; cellular polymers; reaction injection moulding.

MT4008 Properties of Materials (B)   (Spring/4)

3 hours per week; 13 weeks/8th semester; 26L/13LAB; ECTS credits:6

Rubber elasticity; impact behaviour and fracture; two phase polymer systems, thermodynamics and miscibility, blends and alloys; polymer stability, combustion, weathering, degradation and protection, physical ageing.

MT4018 Biomaterials 2 (Spring/4)

3 hours per week; 13 weeks/8th semester; 26L/13T; ECTS credits:6

An introduction to natural materials, biomaterials, mechanics of cellular solids, properties of cortical and cancellous bone, tendon and ligament, mechanical behaviour of soft tissues and the J curve. Elasticity of blood vessel walls. Design and selection criteria. Materials for hard tissue replacement Orthopaedic materials, survey of application, alloys, bone cements, bone substitutes, restorative dental materials, amalgams, composite resins, glass ployalkenoate cements, dental porcelains. Materials for soft tissue replacement, survey of applications, haemocomp-atible materials and coatings, vascular grafts, stents and heart valves. Biodegradable materials. Artificial skin opthalmic materials contact lenses and corneal grafts.
Prerequisite: MT4017

MT4102 Materials Science 1*   (Spring/1)

4 hours per week; 13 weeks/2nd semester; 26L/13T/13LAB; ECTS credits:6

Structure of solid materials; crystalline; amorphous materials; microscopy; metallography and ceramography; binary alloys of the common metals: the phase rule; phase diagrams; structure/property relationships in alloys; structure and properties of polymers; effect of temperature on properties. *Prerequisite MT4101*

MT4104   Physical Metallurgy (Spring/2)

2 hours per week; 13 weeks/4th semester; 13L/13T; ECTS credits:6

Dislocation theory; strengthening mechanisms in metals and alloys; phase transformation and control of microstructure; Austenite decomposition in steels; tempering of marten site; examples of commercial materials exhibiting; above mechanisms.

MT4108   Properties of Materials A* (Spring/4)

3 hours per week; 13 weeks/8th semester; 26L/13LAB; ECTS credits:6

Waves in materials, continuous discrete, phonons, Brillouin zones; heat capacity; heat conduction; thermal expansion; thermal stresses, thermal shock; heat transfer; conduction steady state; high temperature convection, radiation, radiation exchange; refectories; types of refectory, methods of manufacture design, modes of application; metals at high temperatures.
Prerequisite MT4805

MT4202 Engineering Science/Mechanics of Solids* (Spring/1)

4 hours per week; 13 weeks/2nd semester; 26L/13T/13Lab;ECTS credits:6

Statics; bending; stress/strain relationships; buckling instability; yielding; Von Mises criterion, visco elasticity; stress concentration;

MT4208   Materials Selection & Design* (Spring/4)

2 hours per week; 13 weeks/8th semester; 13L/13T;ECTS credits:6

Basic principles of materials selection; assessment of design function; selection procedures; selection for mechanical properties.

MT4218   Photonic Materials   (Spring/4)

3 hours per week; 13 weeks/8th semester; 26L/13LAB; ECTS credits:6

Light and laser light: behaviour and nature of light, principles of lasers.; semiconductors for optoelectronics; LEDs and LDs, fabrication techniques, detectors; integrated optics; wave guide fabrication techniques; devices and device packaging; non-linear optics; modulators and switches; quantum well devices; opto-electronic systems; fibre optic telephone links, fibre optic current sensor, CCD camera, laser scanning camera, compact disc reader.

MT4518   Surface Technology (Spring/4)

4 hours per week; 13 weeks/8th semester; 26L/26T; ECTS credits:6

To acquaint engineers and technologists with the concepts of corrosive degradation and wear processes and to give methodologies by which these processes can be decelerated by the use of electrochemistry, coatings, heat treatments or mechanical working.

MT4704 Materials Process Engineering (Metals)* (Spring/2)

4 hours per week; 13 weeks/4th semester; 26L/26LAB; ECTS credits:6

The science and technology of metallic manufacturing processes; casting technology; forming processes; hot working; joining; welding processes; adhesion; coating techniques.

MT4804 Ceramics and Glass Science 1* (Spring/2)

4 hours per week; 13 weeks/4th semester; 26L/13T/13/LAB; ECTS credits:6

Classification of ceramics; structures of silicates and clay minerals; structure of glasses; green processing and fabrication; firing of traditional ceramics; vitrification and glass formation; binary; and; ternary systems; densification processes; sintering; mechanisms; manufacture and properties of glasses. *Prerequisite MT4303*

MT4902 Materials Technology 1 (Spring/1)

4 hours per week; 13 weeks/2nd semester; 26L/26/LAB; ECTS credits:6

Major materials groups, metals: Ferrous metals and the Fe-C diagram. Non-ferrous metals. Polymers: Ceramics: Composites: Corrosion:

MT4904 Materials Technology 3* (Spring/3)

4 hours per week; 13 weeks/4th semester; 26L/26LAB; ECTS credits:6

To expand the awareness of the student of the processing of engineering metallic materials. To enable the student to understand the effect of the processing rout on the subsequent material properties. Casting; forming; estrusion, forging, rolling, sheet metal; joining; classification of processes; component quality assessment; non-destructive testing. *Prerequisite MT4923*

MT4922   Engineering Materials 1*   (Spring/1)

Classification of solid engineering materials; general properties of materials and the influence of bond type and structure; structure/property relationships ; introduction to phase diagrams; fundamentals of deformation in materials; introduction to simple dislocation, theory of plastic deformation.

MT4932   Materials for Design*   (Spring/1)

4 hours per week; 13 weeks/2nd semester; 26L/13T/13LAB ECTS credits:6

Structure-property relationships in commercial materials; structural and non-structural materials, influence of micro structure, shape and form; evaluation of materials specifications; standard test methods; effect of environment on material performance; methodology of materials selection.
Prerequisite MT410

MT4943 Materials Processing (Spring/2)

4 hours per week; 13 weeks/3rd semester; 26L/26LAB ECTS credits:6

Metals: Casting. Forming: extrusion, forging, rolling, sheet metal work. Joining: mechanical, welding, adhesion, brazing. Polymers. Processing Techniques.

PD4004 Design Visualisation Studio (Spring/2)

3 hours per week; 13 weeks/4th semester; 26L/13LAB; ECTS credits:6

Appreciate the place of the visual image in design. Use a variety of manual design communication methods. Use computers software to model, render and animate design ideas and solutions. Make 3D models of design concepts. Produce a response to a design assignment which reflects a thorough appreciation of visualisation techniques
The visual image, visual thinking, graphic ideation. Visualisation systems. Traditional media, including presentation and rendering techniques. Computer-modelling, rendering and animation. Design for electronic media. 3D Studio – Studio basics and applications. Importing CAD models, Lighting, Rendering, Texturing, Animation. Design presentation assignment.
Prerequisite modules:ID4811, ID4812

PD4014 Design Concept Development and Realisation (Spring/2)

3 hours per week; 13 weeks/4th semester; 26L/13LAB; ECTS credits:6

Produce concept design solutions. Take a user based design approach. Understand the ethics of design. Consider value systems where users are central to the process of design. Understand the formal procedural framework for evaluating design problems. Develop the skills of collaborative design. Design concept development and realisation based on specifications. Ideas development. Concept - generation and development. Concept evaluation, rationalisation and compromise based on specifications and constraints. Elaboration of specifications and presentation of final concept. Sustainability, environmental and universal design issues.
Prerequisite module: Design Research and Specifications

PE4112   Production Technology 1   (Spring/1)

2 hours per week; 13 weeks/2nd semester; 13L/13LAB; ECTS credits:6

Safety in the laboratory; fundamentals of measurement and inspection; process capability, quality, accuracy; basic machining, cutting tool geometry and materials; cutting speeds and feed rates; work holding, positive and frictional restraint, degrees of freedom; joining; mechanical, manual metal 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.

PD4124 Contemporary Design Culture (Spring/2)

3 hours per week; 13 weeks/4th semester; 26L/13LAB; ECTS credits:6

Contextualise their individual works within contemporary and historical practice. **T**race the development of modern design philosophies.**.** Understand the practicalities of working as a professional designer. Debate and discuss design styles, trends, philosophies and ethos. Present design projects which reflect an understanding of the above. Produce an essay exploring a facet of design culture or trend in depth. Discussion and Debate - The Design Soapbox. Contemporary design approaches. International trends. Design Philosophy, Sociology and Psychology. Trend forecasting. Professional Practice. Defining Roles. Forecasting and Trends. Practitioner Lectures and Workshops. Market focus and business development. Field trips and Exhibitions.

PE4118 Forming & Cutting of Engineering Materials 2*   (Spring/4)

3 hours per week; 13 weeks/8th semester; 26L/13LAB; ECTS credits:6

Fundamentals of elasticity and plasticity, plane strain and stress, idealised stress-strain curves and their empirical equations, yield criteria; of Von Mises and Tresca, work-hardening, instability, necking; plane strain tests, tension and compression and side-pressing tests, workability testing; analysis of metal-working processes, slab analysis in strip and wire drawing; bounding and limit analysis, the slip line field theory applied to plane strain forging between flat overhanging platens, computerised drawing of a s.l.f., the finite element method in metal forming, application of FEM to plasticity; mechanics of forming processes, rolling, drawing, extrusion, bending, punching and blanking; hot and cold working; friction and lubrication n metal-forming. *Prerequisite PE4113*

PE4216 Machine Tool Design & Control* (Spring/3)

2 hours per week; 13 weeks/6th semester; 13L/13LAB; ECTS credits:6

Linear systems analysis; transient and steady state response of mechanical systems; applications of Lap lace

Transforms, open and closed loop systems; machine tools, lathes milling and reciprocating machines, presses and special purpose machines; machine tool kinematics, the function and design of shafts, slide-ways and power-screws in the generation of shape; the universal dividing head; variable speed drives, electrical, hydraulic and mechanical drive systems; power train design, gearboxes, flexible drives and clutches; speed and feed control; velocity and acceleration diagrams of sliding pairs and rotating elements; structured design of machine tools, machine component and machine body design for strength and functionality; machine tool vibration.
Prerequisite PE4214

PE4228   Production Equipment Design 2 (Spring/4)

3 hours per week; 13 weeks/8th semester; 26L/13LAB; ECTS credits:6

The general principles of presses and press tool design; piercing, blanking and bending process; tool design associated with piercing blanking and bending processes; optimising blank layout; the general principles of the die-casting process; die casting of metals and alloys, die design principles, material selection and component features used in the manufacture of dies; injection mould tool design; design of cavity layout, grating system and runner system in injection moulding; design of ejection system and sliding cores.

PN4112 Process Technology 1* (Spring/1)

3 hours per week; 13 weeks/2nd semester; 26L/13LAB; ECTS credits:6

Safety in the workshop; care and correct use of hand tools and equipment; correct and safe operation of machine tools; milling of metals and hard plastics; drilling and turning of metals, plastics, wood and wood composites; fundamental hand working techniques; basic foreign; design and realisation of decorative and functional artefacts; application of protective finishes.

PN4116 Process Technology 3*   (Spring/3)

3 hours per week; 13 weeks/6th semester; 26L/13LAB; ECTS credits:6

Multistart thread cutting; straddle and gang milling; generation of geometric forms; cutting times and metal removal rates for machining; ISO standards for tooling; Taylor's equation for tool life; optimum speeds and feed rates; manufacture of mechanical systems elements; consideration of the impact of selected processing methods on the work environment.
Prerequisite PN4113

PN4216   Engineering/Building Design Graphics* (Spring/3)

2 hours per week; 13 weeks/6th semester; 13L/13LAB; ECTS credits:6

Intersection of surfaces (composite) - hinged planes; advanced problems on planes and their applications; skew line analysis - synthesis of geometries; conics - centres of curvature; special curves - their properties and applications; perspective projection; advanced transformation geometry; the geometry of sheet metalwork; gears and gear drives; conventional representations in engineering graphics; link mechanisms and their loci; construction of cam profiles to various

specifications; schematic diagrams of electric and electronic systems.
Prerequisite PN4216

PN4218   Engineering Design Graphics 2* (Spring/4)

2 hours per week; 13 weeks/8th semester; 13L/13LAB; ECTS credits:6

Problems in advanced perspective projection; shadow in perspective; reflection in perspective; mining and topographic geometry; earthworks geometry - curved gradients; applied area conversions; projective geometry; building design details; surface and boundary definition of composite solids; advanced cognitive modelling strategies; the computer as a graphics learning tool; computer graphics in design representation/communications; visualising three-dimensional compositions; strategies of freehand representation; 3D objects libraries; solid primitives; boundary representation and constructive solid geometry considerations; surface, wire frame and solid modelling techniques; composite solid models; shading - placing lights and camera; extrusions; 3D faces.
Prerequisite PN4226

PN4226 Engineering Design Graphics 1 (Spring/3)

5 hours per week; 13 weeks/6th semester; 13L/52LAB; ECTS credits:6

Intersection of surfaces (composite) - hinged planes; advanced problems in planes and their applications; skew line analysis - synthesis of geometries; conics - centres of curvature; special curves - their properties and applications; perspective projection; advanced transformation geometry; the geometry of sheet metalwork; gears and gear drives; conventional representations in engineering graphics; link mechanisms and their loci; construction of cam profiles to various specifications; schematic diagrams of electric and electronic systems.

PN4228 Engineering Design Graphics 2* (Spring/4)

2 hours per week; 13 weeks/8th semester; 13L/13 LAB; ECTS credits:6

Problems in advanced perspective projection; shadow in perspective; reflection in perspective; mining and topographic geometry; earthworks geometry - curved gradients; applied area conversions; projective geometry; building design details; surface and boundary definition of composite solids; advanced cognitive modelling strategies; the computer as a graphics learning tool; computer graphics in design representation/communications; visualising three-dimensional compositions; strategies of freehand representation; 3D objects libraries; solid primitives; boundary representation and constructive solid geometry considerations; surface, wireframe and solid modelling techniques; composite solid models; shading - placing lights and camera; extrusions; 3D faces.
Prerequisite PN4226

PN4318   Machine Control*   (Spring/4)

3 hours per week; 13 weeks/8th semester; 26L/13LAB; ECTS credits:6

The concept of automatic control; open and closed loop control; the machine control unit for NC and CNC systems; concepts of position and velocity transducers; programming languages for CNC controllers; tool path graphics; information input systems; pneumatic, hydraulic and electrical power systems for machine control.

PT4112   Manufacturing Technology 2* (Spring/1)

1 hour per week; 13 weeks/2nd semester; 13LAB; ECTS credits:6

Precision measurement and inspection; process capability; quality and accuracy; machining; fundamental treatment of the shear plane; work holding; welding techniques; mechanical joining.
Prerequisite PT4111

PT4114   Manufacturing Technology 3*   (Spring/2)

3 hours per week; 13 weeks/4th semester; 26L/13LAB; ECTS credits:6

Screw threads, BS3643; machining; screw-cutting; multi-start and left-hand threads and worms; eccentric and taper turning; straddle and gang milling; the dividing head for simple and compound milling; the production of fine machines surfaces by grinding, lapping, honing, super finishing and diamond machining; marking out methods and accuracy.
Prerequisite PT4112

PT4118   Manufacturing Technology 6*   (Spring/4)

3 hours per week; 13 weeks/8th semester; 26L/13LAB; ECTS credits:6

Special machining processes; injection mould and pressure die-casting design; design of piercing, blanking, cropping and sawing tools; design of specialist tools/tooling systems for above processes.
Prerequisite PT4117

PT4324   Productivity Methods 2*   (Spring/2)

4 hours per week; 13 weeks/4th semester; 26L/26LAB; ECTS credits:6

Non-observational time estimation: predetermined motion time systems (MTM, work-factor); activity/occurrence sampling; work activity analysis, MTM-C, procedural analysis; principles of muscular work; effects on cardiovascular system, lifting and handling work; the working environment.
Prerequisite PT4313

PT4424   3D CAD Modelling (Spring/2)

4 hours per week; 13 weeks/4th semester; 52 LAB; ECTS credits:6

The engineering design process and the 3D feature based model as a design database; its relevance to concurrent engineering; design visualisation; creating features; surface, solid and parametric modelling and design; design intent; planning parts for design flexibility; relations and equations; parametric dimensions; modelling for manufacture and assembly; design for manufacturing; assembly models and drawings; drawing documents; BOMs design of simple fixtures, creating design tables using Excel for multiple part and assembley configurations, Library features; importing and exporting files; CAD standards for data exchange; STL files and the FDM rapid prototyping system, linking with CAM. The CAD database and other downstream applications; equation solvers, FEA, simulation software.
Prerequisite: PT4423

PT4428 Process Design (Spring/4)

4 hours per week; 13 weeks/8th semester; 26L/26 LAB; ECTS credits:6

Production flow analysis in cellular manufacturing and functional layout. Design of a manufacturing chain using a number of manufacturing cells. Process improvement technique based on process benchmarking and design of experiments using traditional and Taguchi methods. Failure Modes and Effect Analysis (FMEA). Process optimisation using set up time reduction techniques SMED. Product prototyping including hand crafted models and rapid prototyping methods. *Prerequisite: PT4427*

PT4518   Automation Technology 3 (Spring/4)

4 hours per week; 13 weeks/8th semester; 39L/13LAB; ECTS credits:6

The concept of integrated manufacturing systems; CAD as a data generating system; databases; database management systems, storage of data relational and hierarchical data bases; data modelling expert systems MRP, CAPP, (group coding systems), computer aided production and inventory control; integration of functional areas; MAP, TOP, EDI. Overview of CIM elements; description of role of CAD, CAPP, group technology, CAM; computer techniques - databases; conceptual schemes, logical storage schemes, application of database technology to manufacturing; knowledge-based systems to manufacturing; computer aided production and inventory control; production planning, master production scheduling, the manufacturing system database, materials requirement planning, capacity planning, role of JIT in production, production activity control; enterprise integration.
Prerequisite PT4517

WT4102 Wood Science 1 (Spring/1)

3 hours per week; 13 weeks/2nd semester; 26L/13LAB; ECTS credits:6

Microscopic and macroscopic structure of wood; chemical composition of wood; wood-moisture relationships; mechanics; physics of wood; conversion of wood; effect of process on structure property relationships.

WT4104 Wood Science 2* (Spring/2)

3 hours per week; 13 weeks/4th semester; 26L/13LAB; ECTS credits:6

Wood; moisture relationships in wood; modification of wood-moisture relationship; air-drying and natural seasoning; steaming, re-moisture, moisture gradient control; kiln drying, fundamentals of kiln-drying, defects, equilibrium; kilns and instrumentation; specialised seasoning methods; physical properties of wood.
Prerequisite WT4102

WT4202 Design Studio*   (Spring/1)

3 hours per week; 13 weeks/2nd semester 13L/13T/13LAB; ECTS credits:6

The process of problem analysis to function and markets; the principle and elements of design relationships, shape, form, and texture; seminars/projects; exploration of design theory through visits and workshop sessions.

WT4204 Mechanic of Design*   (Spring/2)

3 hours per week; 13 weeks/4th semester; 26L/13LAB; ECTS credits:6

Detailed design of components, carcass and finished assemblies; standards, tests, specification, case studies; ergonomics and manufacturing considerations; analysis and innovative improvement of existing products. *Prerequisite PT4111*

WT4207 Structural Design   (Spring/4)

4 hours per week; 13 weeks/7th semester; 26L/26LAB; ECTS credits:6

Structural analysis and design with emphasis on timber and timber based products; stress grading visual and machine; ties struts, beams, frames and panels; loading; stresses axial, bending and shear; materials; solid, composites, Glulam, plywood; fabrication site and factory; performance and maintenance. *Prerequisite: WT4104*

WT4214 Design and Technology   (Spring/2)

6 hours per week; 13 weeks/4th semester; 26L/52LAB; ECTS credits:6

The design process; problem definition and analysis; investigation of alternative solutions; the principles and elements of design; systems and task analysis; flow diagrams and process charts; human need; drawing as a resource for design; compilation and presentation of design reports; design and realisation of a solution to a specified problem.

WT4228 Furniture Production 2 (Spring/4)

4 hours per week; 13 weeks/8th semester; 26L/26LAB; ECTS credits:6

Machining schedules; flow production techniques; plant provision/layout for a variety of product ranges; provision for `solid' and manufacturing board technology; employment of CAD/CAM and CNC machinery; quality standards; safety regulations; testing. *Prerequisite: WT4427*

WT4304 Machining Technology 2* (Spring/2)

3 hours per week; 13 weeks/4th semester; 26L/13LAB; ECTS credits:6

Machine optimisation, analysis of factors governing mass production processing; product design, process and assembly interrelationships; introduction to CNC machining; planned maintenance; practical applications. *Prerequisite MT4303*

WT4402/WT4412 Process Technology 1 (Wood) (Spring/1)

4 hours per week; 13 weeks/2nd semester; 26LAB; ECTS credits:6

Safety in the workshop; introduction to basic machine processes; joint design; decorative process; selection of tools, processes and fittings to meet specific applications; design and realisation of functional artefacts; wood degrade, preservation and finishing; adhesive bonding; composite board materials; the forest as a resource.

WT4404 Wood Technology 1*   (Spring/2)

3 hours per week; 13 weeks/4th semester; 26L/13LAB; ECTS credits:6

Evolution of design in wood; materials selection, detailing and finishes to satisfy structural, functional and environmental criteria; applications - primary, secondary

and temporary elements of buildings, finishes of interiors; project design and analysis. *Prerequisite WT4303*

WT4502 Construction Technology and Management 2 (Spring/2)

4 hours per week; 13 weeks/2nd semeseter;26L/26Lab; ECTS credits: 6

Site selection and analysis for residential construction. Soil identification, properties and behaviour – factors affecting drainage and foundation choice. Concrete technology and mix design, environmental considerations in residential construction – sustainable technologies for waster disposal and energy. Intro to housing estate development and planning applications. Interpretation of construction drawings. Trouble shooting residential building problems via case histories. Irish architectural heritage and conservation. *Prerequisite WT4401*

WT4902 Model Making   (Spring/1)

5 hours per week; 13 weeks/2nd semester; 13L/52LAB; ECTS credits:6

An introduction to machines, equipment and tools for cutting, shaping, joining and finishing; health and safety in the workshop; model making techniques using wood, metals and plaster of Paris; analysis of shapes and graphic presentation; analysis and selection of applied finishes for various applications and effect. *Prerequisite ID4811*

WT4906 Building Construction 1*   (Spring/3)

4 hours per week; 13 weeks/6th semester; 39L/13LAB; ECTS credits:6

Soil mechanics; properties and classification of soils, ground water and its effects, consolidation, compressibility of soils, stress distribution, retaining walls, site investigation, interrelationship of soils and foundations; concrete manufacture, materials and mix design; ground water treatment and ground water control systems. *Prerequisite WT4905*

WT4908 Building Construction. 3* (Spring/4)

3 hours per week; 13 weeks/8th semester; 39L; ECTS credits:6

Comparative study of the main structural framing materials and forms; comparative analysis of wall design and construction relative to scale, use and location; building failures; maintenance repair and alteration of buildings; fire: evaluation of buildings - design, construction and performance. *Prerequisite WT4906*

WT4918 Project Planning and Control * (Spring/4)

4 hours per week; 13 weeks/8th semester; 39L/13LAB; ECTS credits:6

Site operations; relims; local authority requirements, requisitions, site layout - access, temporary roads, hutments, stationary plant, temporary works; planning programming and progressing; network/programme analysis; surveying and levelling; construction, use and

care of dumpy and tilting levels, hand level and abney clinometers - reading of metric staff; introduction to the theodlite and electro-distance measuring; principles of levelling; longitudinal and cross-section, plotting profiles; contours and contouring; gradients; calculations of areas and volumes; practical field work.

WT4928 Building Services 2* (Spring/4)

3 hours per week; 13 weeks/8th semester; 39L; ECTS credits:6

Sound; planning in relation to noise; heating, ventilation and air conditioning; space heating; electricity - requirements and distribution for commercial and industrial buildings; communication systems; light; the artificial lighting of interiors and its integration with the interior environment and structure; drainage; the development of above ground drainage/waste systems for high rise buildings; drainage below ground, public sewage treatment and disposal; energy; transportation; the thermal optimisation of the building structure.
Prerequisite WT4915

Science Modules

BC4608 Bioprocess Technology 2*   (Spring/4)

2 hours per week; 13 weeks/8th semester; 26L; ECTS credits:6

Downstream processing in biotechnology. Cell disruption techniques, Homogenisation, bead milling, lysis. Purification of fermentation broths], filtration and centrifusion. Membrane separations , microfiltration, ultrafiltration, nanofiltration, reverse osmosis. Membrane materials and performance. Equipment conformation and operation. Process scale chromatography. Affinity

purification techniques. Case studies in bioprocess technology eg. Biopharmeceutical purification via affinity techniques-the interferons-large scale culture of mammalian cells. *Prerequisite Process Technology 1 & Bioprocess technology 1*

BC4708 Industrial Biochemistry 2*   (Spring/4)

4 hours per week; 13 weeks/8th semester; 26L/26T; ECTS credits:6

Animal cell biotechnology .Reactors and growth conditions. Industrial scale production. Secretion of recombinant products. Diagnostics. Applied Immunology. Vetinary diagnosticsand products. Diagnostic use of probes. Diagnostic kit formulation. Enzyme electrodes. Vaccines and vaccine production. Immunossays , latex, membrane based, enzyme , radioimmunossay Patenting in biotechnology. ISO9000 and laboratory accreditation. The new biopharmaceuticals, products of recombinant DNA technology]vaccine and adjuvant technology biotechnology of cytokines. *Prerequisite BC4903,BC4904, BC4915*

BC4002/BC4902 Introductory Biochemistry* (Spring/1)

4 hours per week; 13 weeks/2nd semester; 26L/26LAB;ECTS credits:6

Aromatic and aliphatic compounds. Saturated and unsaturated hydrocarbons. Oxygen-containing compounds, acids, esters, alcohol's carbonyl compounds. Nitrogen-containing compounds. amines, amides, amino acids. Polymers. Introduction to biomolecules. Carbohydrates, Lipids, Proteins, Nucleic Acids .Bioinorganics. Analbolic and catabolic processes. Carbohydrate metabolism, Glycolysis and Krebs cycles Bioenergetics, energetics of anaerobic/aerobic glycolysis. Blood composition],oxygen transport,ion transport, sweat, heat, and pH balance Hormonal regulation of cellular processes. Nutrition and digestion. Measurement, diagnosis and analysis in clinical and sports biochemistry *Prerequisite CH4761*

BC4904 Biochemistry 2* (Proteins and Nucleic Acids) (Spring/2)

7 hours per week; 13 weeks/4th semester; 26L/26T/39LAB; ECTS credits:6

The 3D structure of proteins; strategies of protein purification; enzyme kinetics and catalysis; protein sequencing; the structure of DNA; DNA sequencing; replication, transcription and translation; mutagenesis and DNA repair; gene expression, the lac and trp operons.
Prerequisite BC4903

BC4948 Advanced Immunology (Spring/4)

3 hours per week; 13 weeks/8th semester; 26L/13T; ECTS credits:6

Brief over view of the human immune system; complement, phagocytosis, cytotoxicity; antigen recognition: antibodies, T cell receptors, MHC; manipulation of the antigen recognition properties/effector functions of antibodies and T cell receptors; lymphocyte development; regulation of the immune response; idiotypic network; distinction between self and non-self; molecular basis of autoimmunity; immunotechniques: examples, theory and applications; in vitro production of immune system components; phage display technology; transgenic animals, knock-out mice, SCID mice);gene therapy; ethics of genetic engineering;

vaccine and drug development , with case studies.
Prerequisite BC4947

BY4002   Biology 2* (Spring/1)

4 hours per week; 13 weeks/2nd semester; 26L/26LAB; ECTS credits:6

Cellular reproduction; plant structure and function; 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; regulation of gene activity; recombinant DNA and biotechnology; evolutionary theories; introduction to taxonomy; principles and scope of sociology.
Prerequisite BY4001

BY4006   General Biochemistry*   (Spring/3)

4 hours per week; 13 weeks/6th semester; 26L/26LAB; ECTS credits:6

Introduction to biochemistry; enzymes; kinetics; and application; metabolism; ATP; central metabolism: principal sequences; food and nutrition: macro nutrients, micro nutrients; cholesterol, fibre, additives, eating disorders; bioenergetics; biological membranes as interfaces; biochemistry of muscle action, nerve action, and vision; hormone action mechanisms; introduction to the analysis of biomolecules, metabolites; cholesterol, and enzyme kinetics.
Prerequisite BY4001

BY4008   Genetic and Molecular Biology* (Spring/4)

4 hours per week; 13 weeks/8th semester; 26L/26LAB; ECTS credits:6

Extensions of Mendelian genetics; linkage; multiple alletes, multiple genes and episatasis; chromosome structure, meiosis / mitosis, the biochemistry of protein synthesis.; mutation causes and effects at the gene chromosome and organism levels; basic principles of plant and animal breeding; human genetics; introduction to population genetics; microbial genetics; genetic exchange mechanisms, plasmids; immune system function; allergy; immune surveillance immune deficiency, AIDS; monoclonal antibodies.

BY4018 Plant & Animal Physiology   (Spring/4)

4 hours per week; 13 weeks/8th semester; 26L/26LAB; ECTS credits:6

Macro and micro nutrients in plant nutrition water relations in plants photosynthesis and carbon metabolism secondary plant metabolism control of plant growth and development; mammalian reproduction; structures, functions and control lactation; artificial control of reproduction and lactation in farm mammals; ruminant nutrition and growth; food evaluation and feeding standards for reproduction and lactation.

BY4104 Ecology 1* (Spring/2)

4 hours per week; 13 weeks/4th semester; 26L/26LAB; ECTS credits:6

Woodland ecosystems; vegetation sampling; freshwater ecosystems; marine ecosystems; rocky shores; brief consideration of sandy, muddy and estuarine ecosystems.
Prerequisite BY4002

BY4208   Agriculture 2 (Spring/4)

4 hours per week; 13 weeks/8th semester; 26L/26LAB; ECTS credits:6

Dairy herds; sheep production, principles of prod; Principles of beef production; conventional versus intensive production; calf rearing, diseases of cattle; production of milk; markets for dairy products; management of ducting, housing and management.

CH4002   Physical Chemistry 1*(Thermo-dynamics and Kinetics) (Spring/1)

4 hours per week; 13 weeks/2nd semester; 26L/26LAB; ECTS credits:6

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; entrophy, Clausius inequality; Gibbs and helmholz free energies; chemical equilibrium; variations with temperature and pressure; introduction to chemical kinetics; zero, first and second order rate laws; activation energy and the Arphenius equation; accounting for the rate laws; steady state approximation.Michaelis-Menten equation.
Prerequisite CH4701

CH4004   Physical Chemistry 3*(The Liquid State) (Spring/2)

6 hours per week; 13 weeks/4th semester; 26L/13T/39LAB; ECTS credits:6

Second and third laws of thermodynamics, entropy changes, free energy terms. Fundamental equations of thermodynamics. Activity and fugacity. Simple mixtures ,Gibbs-Duhem equation. Solubility, Real Solutions, Activity Coefficients, Electrolytic Solutions .Ionic solvation, ion transport in solution, conductivity. Dynamic equilibrium, electrochemical cells(1)Galvanic (2)Electrolytic.Thermodynamics of cell reactions,Nernst equation,free energy changes in cells,electrochemicseries.
Prerequisite CH4003

CH4054   Introductory Physical Chemistry   (Spring/2)

5 hours per week, 13 weeks/4th semester; 26L/13T/26LAB; ECTS credits:6

The first and second laws of thermodynamics; chemical equilibrium; ions in aqueous solution; electrochemical cells; electrolytic conductivity; reaction kinetics and enzyme kinetics. *Prerequisite: CH4071*

CH4102 Organic Chemistry 1   (Spring/1)

5 hours per week, 13 weeks/2nd semester; 26L/39LAB; ECTS credits:6

Alkanes; cycloalkanes: structural formulae,nomenclature, isomerism ,conformational analysis,free radical reactions. Alkenes ;alkynes;nomenclature, geometric isomerism, electrophilic additions reactions, carbonium ionsa Markovnikoff'srule. Haloalkanes :nomenclature, substitution and elimination reactions-Sn1,Sn2,E1,E2.Alcohols;ethers;epoxides:methods of preparation and typical reactions. Aldehydes; ketones: methods of preparation ,typical carbonyl group reactions-nucleophilic addition , keto-enol tautomerism ,reactions at the *a* position, enolate anions, Aldol condensation, Grignard and Wittig reactions ,use of simple protecting groups eg. Acetals. Synthetic methodology-elementary retrosynthetic analysis.

CH4104 Organic Chemistry 3*   (Spring/2)

5 hours per week; 13 weeks/4th semester; 26L/39LAB; ECTS credits:6

Amino Acids: structure, stereochemistry, acid ionization, methods of synthesis Gabriel and Strecker synthesis and modification malonic ester and gabriel synthesis. Peptides: strategy for synthesis ,use of protecting groups and activating agents, solid phase synthesis using Merrifield resin. Proteins: primary, secondary and tertiary structures, enzymes as catalytic proteins, DNA, transcription and translation. Carbohydrates: structure and stereochemistry of monosaccharides, mutarotation, oxidation and reduction reactions, synthetic transformations of; disaccharides and polysaccharides, structure and function, chemical and enzyme degredation products, chemically modified polysaccharides-cellulose acetate, nitrate and xanthate cyclodextrins. *Prerequisite CH4102,CH4103*

CH4108 Organic Pharmaceutical Chemistry*(Ad Organic Chemistry)   (Spring/4)

4 hours per week; 13 weeks/8th semester; 26L/26T; ECTS credits:6
Selectivity of action of reagents and catalysts: regiochemical control-addition of HBr by ionic and radical mechanisms ,alcohol formation by acid catalysed hydration and via hydroboration; chemose lectivity-Reformatsky reaction, hydride reducing reagents, Lindlars catalyst and dissolving metal reduction; stereochemical control, as exemplified by Lindlars catalyst and dissolving metl reduction, general principles of asymmetric induction-Cram's Rule, chiral reagents(hydride reducing agents-Alpine hydrides)for enantioselectivity and chiral catalysts(Monsanto catalyst for L-dopa production).Enzymes as chiral catalysts. Structure activity relationships and acid base catalysis :Development and use of the Hammett equation, Taft equation; definition of general and specific acid and base catalysis, use of buffers and kinetic data to distinguish between general and specific catalysis, relevance of general acid/base catalysis to enzyme catalysis. Molecular basis of drug design-cimetidine case study:definition of agonists and antagonists, histamine as a locally acting hormone,H1 and H2 receptor sites and function, development of cimetidine-structure/activity aspects.(In addition variety(approx15) of named organic reactions(such as the Mannich reaction, Robinson annelation, Sharpless epoxidation) are also covered by way of student presentations throughout the module) *Prerequisites CH4102,CH4103*

CH4152 Introductory Organic Chemistry 1B (Spring/1)

4 hours per week; 13 weeks/2nd semester; 26L/26LAB;ECTS credits:6

Alkanes cycloalkanes: structural formulae, nomenclature, isomerism, conformational analysis, free radical reactions .Alkenes alkynes: nomenclature, geometric isomerism, electrophilic additions reactions-Sn1,Sn2,E1,E2.Alcohols;ethers;epoxides:methods of preparation and typical reactions. Aldehydes; ketones: Structure, nomenclature, methods of preparation. Nucleophilic addition reactions(addition of derivatesof NH3,Grignard reagents).Hydride reduction reactions, oxidation. Wittig reaction. Keloenol tantomerisation, reactions at the *a* : position. Aldol condensation. Syntetic methodology-elementary retrosynthetic analysis. *Prerequisite CH4701*

CH4202 Inorganic Chemistry 1*   (Spring/1)

4 hours per week; 13 weeks/2nd semester; 26L/26LAB; ECTS credits:6

Covalent bonding; valence bond treatment, molecular orbital treatment; resonance and electron delocalisation. Comparison of valence bond and molecular orbital approaches. Polarity in bonds. Molecular Crystals.Ionic crystals estimation of ionic radii, radius ratio and its importance, Madelung constants and estimation of lattice energies,the Born-Haber Cycle. Structure of metals, Band theory as applied to conductore, semiconductors and insulators. Bonding in transition metal complexes, crystal field theory, molecular orbital approach, bonding ligands. Clustre compounds, multiple metal to metal bonds. The influence of bonding on the physical properties of materials is emphasised throughout the module. *Prerequisite CH4701*

CH4252 Inorganic Chemistry 1B*   (Spring/1)

5 hours per week; 13 weeks/2nd semester; 26L/13T/26LAB; ECTS credits:6

Covalent bonding; comparison of valence bond and molecular orbital approaches; ionic crystals; lattice energies; structure of metals; bank theory; bonding in transition metal complexes, crystal field theory; cluster compounds. *Prerequisite CH4701*

CH4304 Analytical Chemistry 2*   (Spring/2)

6 hours per week; 13 weeks/4th semester; 26L/13T/39LAB; ECTS credits:6

The structure of crystalline solids; crystal lattice, lattice points, crystal structure; application of X-ray methods including diffraction, fluorescence and electron microprobe analysis; structure determination by X-ray methods; solid state reactions including corrosion and cement chemistry; relationship between chemical and mechanical properties; application of group theory, including point and space groups. *Prerequisites CH4003,CH4303*

CH4308 Discrete Analytical Methods   (Spring/4)

3 hours per week; 13 weeks/8th semester; 26L/13T; ECTS credits:6

Sample pre-treatment and separation; emission spectroscopy based upon plasma, arc and spark atomisation; Raman spectroscopy; radiochemical methods; automated methods of analysis; HPLC. *Prerequisite: CH4303*

CH4354   Analytical Chemistry for the Environment* (Spring/2)

6 hours per week; 13 weeks/4th semester; 26L/13T/39Lab; ECTS credits:6

Survey of analytical methods; electrometric methods; chromatographic methods; spectroscopic methods; mass spectrometry; thermal analysis; water analysis; gas analysis.

CH4404 Process Technology 1   (Spring/2)

6 hours per week; 13 weeks/4th semester; 26L/13T/39Lab; ECTS credits:6

Health and safety at work :types of factory enviornment 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 eg. 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.

CH4408 Industrial Process Chemistry 2* (Spring/4)

2 hours per week; 13 weeks/8th semester; 26L; ECTS credits:6

Chemical and process aspects of petrochemistry and the production of bulk organic chemicals Hydrotreating, reforming, cracking, production of vinyl chloride monomer, Acrylonitrile, maleic anhydride. Selective oxidation and ammoxidation: fundamentals(kinetic isotope effects in determining reaction mechanism)and applied(study of flammability limits)aspects. Chemical and Engineering aspects of energy conversion; fuels, their analysis and ranking;production of thermal energy-combustion etc. combustion methods and systems, steam Generators; enviornmental impact of power flat operation: water treatment-coagulation, aeration,ion-exchange and chemical precipitation softening ,adsoption ,membrane processes.
Prerequisite CH4415,CH4407,CH4103,CH4203

CH4554 Environmental Chemistry* (Spring/2)

6 hours per week; 13 weeks/4th semester; 26L/13T/39LAB; ECTS credits:6

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, bioaccumulstion. Biochemical cycles for *Prerequisite CH4701*

CH4608 Plant Process Management   (Spring/3)

Principles of accident prevention; legal, humanitarian and economic reasons for action. Management Responsibilities Accident causation modes. Definitions of hazard and risk. Risk identification ,evaluation and control. Accident investigation, job safety analysis. Safe system of work, emergency procedures Occupational Health. dermatitis, Respiratory diseases, solvents, chemicals ,gases. Noise and vibration, Heat and Cold ;radiation. Human error Occupational hygiene Recognition ;evaluation; control. Accident case studies. Costing of chemical plant; stages of costing, methods of cost prediction, exponential, factorial etc. Cost updating. Economic evaluation of chemical projects; pay-back, ROI,NPV DCFROR etc. Alternative projects. Sensitivity analysis.

ER4304 Geoscience (Spring/2)

3 hours per week; 13 weeks/4th semester; 26L/13T; ECTS credits:6

Terrestrial and coastal geomorphologic history at global and Irish scales; methods of gaining and analysing remotely sensed data.

ER4404 Managing the Environment (Spring/2)

Environmental management systems; environmental monitoring, environmental auditing.

ER4408 Environmental Management 2 (Spring/4)

Global, EU and Irish law policy and structures concerning environmental management; Environmental Protection Agency: structure and functions; the reasons why industry is increasingly embracing environmental management, and ways in which this is achieved within corporate organisations; case studies of environmental management as a planning tool within economic development.

ER4418 Humanity and Ecosphere (Spring/4)

Energy flow in ecosystems; human interventions in energy flow; maintenance of atmospheric gases, and human interventions within these processes; biogeochemical cycling in the ecosystem, and human intervention within them; ecological succession, and human manipulation of these processes.

ER4438 Environmental Fate Modelling (Spring/8)

Atmospheric emissions, dispersion modelling, emission impact; pollutant transport in surface waters, air water exchange, physical transport; groundwater movement, pollutant characteristics, retardation factors; computer modelling, prediction of transport patterns.

ER4508 Pollution Control 2 (Waste Management) (Spring/4)

Waste minimisation; hazardous waste management; waste to energy systems: incineration, landfill; composting; leakage control and gas capture; waste recycling techniques and economics; reuse of waste materials; component recovery: biogas; algae, weed and fish production; novel waste management techniques.

ER4608 Clean Technology 2 (Spring/4)

Identification of the main sources of waste emissions in energy generation or chemical processes; monitoring industrial processes; methods of reducing gaseous or aqueous emissions using: catalytic processes, scrubbing, electrochemical treatments; control of fugitive emissions; recycling and reuse of waste: solvent recovery; energy efficiency.

EQ2002 Horsemanship 2   (Spring/1)

5 hours per week; 13 weeks/2nd semester; 26L/39LAB; ECTS credits:6

Principles of training with reference to exercise physiology and its application to the horse. Riding techniques and specific training methods.

EQ2102 Horsemanship 2A (Spring/1)

5 hours per week; 13 weeks/2nd semester; 26L/39LAB; ECTS credits:6

Principles of training with reference to exercise physiology and its application to the horse. Riding

techniques and specific training methods Teaching the beginning and novice riders; pupil/teacher interactions. Safety considerations.

EQ3006 Problem Identification & Practical Solutions

This module develops the material included in the module advanced riding techniques and problem analysis through practical and exploitation of the principles and practices promoted there: emphasis will be placed on the importance of identifying root causes of incorrect performance, resistance and evasion; methods of teaching advanced riding techniques.

EQ4002 Equine Exercise Science 1 (Spring/1)

5 hours per week; 13 weeks/2nd semester; 26L/39LAB; ECTS credits:6

Principles of training with particular reference to exercise physiology and its application to the equine athlete. Riding techniques and specific training methods. Analysis and evaluation of the physical parameters associated with the different types of sport horse competition. Riding theories

EQ4004 Equine Management (Spring/2)

5 hours per week; 13 weeks/4th semester; 26L/39LAB; ECTS credits:6

Lungeing and long-reining the young horse. Care, maintenance and fitting of equipment, grooming, hygiene, clipping, trimming and plaiting. Preparing the horse for sale. Shoeing and foot care. Bandaging, Equine first aid. Knowledge of and the practical administration of medication. Therapeutic treatments of injuries. Preparation for travelling the horse by road, sea and air. Construction and maintenance of artificial and natural riding surfaces.

EQ4008 Equine Teaching Principles 2 (Spring/4)

5 hours per week; 13 weeks/8th semester; 26L/39LAB;ECTS credits:6

Knowledge of the requirements and rules of various types of 'competition' disciplines. Methods of improving the skills of horse and rider. Methods of producing the mental and physical preparedness needed for competition by horse and rider. Sports Psychology. The communication triangle - coach, pupil, horse.

EQ4018 Equine Competition 2 (Spring/4)

5 hours per week; 13 weeks/8th semester; 26L/39LAB; ECTS credits:6

Study of the different international schools of dressage training and trainers. Evaluation of different international events. trainers and their methods. Analysis of different types and levels of show jumping competition and the specialist training needed. The theory and practice of course building and fence structure.

EV4004 Equine Reproduction and Management of Mares and Stallions   (Spring/2)

4 hours per week; 13 weeks/4th semester; 26L/26LAB; ECTS credits:6

Factors affecting selection of equine breeding stock. Breeding practices. Management of equine breeding stock. Parturition and care of the neonate and dam.

Lactation in the mare. Artificial Insemination and pregnancy diagnosis. Infertility, pregnancy failure

EV4008 Equine Genetics*   (Spring/4)

4 hours per week; 13 weeks/8th semester; 26L/26LAB; ECTS credits:6

Review of basic genetics; genetics of evolution and speciation; genetics and anima; disease; genetics and breed improvement. *Prerequisite BY4001*

EV4012 Equine Anatomy and Physiology (Spring/1)

4 hours per weeks; 13 weeks/2nd semester; 26L/26LAB; ECTS credits:6

The anatomy of the horse with reference to the musculoskeletal structure and organs. The main systems of the horse; digestive, respiratory, circulatory, reproductive, urinary, nervous and immune. Consideration of the theoretical background to the use and operation of modern diagnostic/treatment equipment.

EV4014 Equine Nutrition*   (Spring/2)

4 hours per week; 13 weeks/4th semester; 26L/26LAB; ECTS credits:6

Principal feedstuffs, composition, analysis and energy values; feeding principles; nutrient requirements of barren, pregnant and lactating mares; nutrient requirement of horses/ponies in training, convalescent, etc. Nutrient requirements of the orphan foals. *Prerequisite EV4001*

EV4018 Equine Health and Behaviour   (Spring/4)

4 hours per week; 13 weeks/8th semester; 26L/26LAB; ECTS credits:6

Performance-related conditions. Current thinking in exercise physiology. Evaluation of performance. Acid-base balance and electrolyte disturbances. Muscle disorders. Exercise induced pulmonary haemorrhage. Transportation of horses. Normal pattern of behaviour and behavioural problems. Horse selection and well-being. Evaluation. Domestication.

EV4022 Equine Anatomy & Physiology (Cert) (Spring/1)

The anatomy of the horse; the main systems of the horse; digestive, respiratory, circulatory, including lymphatics; reproductive including embryology and physiology of reproduction; urinary; nervous and immune; consideration of the theoretical background to the use and operation of modern diagnostic/treatment equipment

FT4414 Food Technology 2 (Spring/4)

7 hours per week; 13 weeks/4th semester; 26L/26T/39LAB; ECTS credits:6

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.

FT4418 Food Technology 5 (Spring/4)

2 hours per week; 13 weeks/8th semester; 26L; ECTS credits:6

Soils and plant nutrition; 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.

FT4428 Advanced Food Chemistry (Spring/4)

4 hours per week; 13 weeks/8th semester; 26L/26LAB; ECTS credits:6

Detailed treatment of the biochemistry 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.

FT4438 Food Microbiology (Spring/4)

4 hours per week; 13 weeks/8th semester; 26L/26T; ECTS credits:6

Roles of major families of micro organisms in food preservation/spoilage, food fermentation and public health; isolation and characterisation; microbial testing and control in food products; HACCP and quality systems; foodborne pathogens of current concern including listeria monocytogenes, psychrophilic C, botulinum, aeromonas, yershinia, bacillus cereus, salmonella.

FT4448 Food Technology 6 (Spring/4)

3 hours per week; 13 weeks/8th semester; 26L/13T; ECTS credits:6

Implications of technologies used in agriculture and by the food industry for consumer health; potential hazards associated with residues of agricultural chemicals/veterinary products; toxicological and nutritional implications of food processing; control systems needed to ensure consumer health and to ensure consumer confidence.

HC4304 Horticulture 1 (Spring/2)

5 hours per week; 13 weeks/4th semester; 26L/13T/26LAB; ECTS credits:6

Physiological and environmental plant growth factors; micro propagation; vegetative propagation; seed propagation; seed dormancy; pruning; insect, disease and weed identification/control; organic growing; marketing.

PH4002 General Physics 2   (Spring/1)

5 hours per week; 13 weeks/2nd semester; 26L/13T/26LAB; ECTS credits:6

Heat; laws of thermodynamics; Carnot cycles; entropy; heat transfer; Stefan-Boltzmann law; wave motion ; Doppler effect; sound; light; the electromagnetic spectrum; sources of light, UV, visible and IR;He-Ne LASER; geometical optics; physical optics; optical systems.

PH4012 Physics for Engineers 2 (Spring/1)

5 hours per week; 13 weeks/2nd semester; 26L/13T/26LAB; ECTS credits:6

Heat; laws of thermodynamics; heat capacities; Carnot cycles entropy; heat transfer; Stefan-Boltzmann law; wave motion; Doppler effect; sound; light; electromagnetic spectrum; source of light, UV, visible and IR; geometrical optics; physical optics; optical systems. *Prerequisite: PH4011*

PH4104 Physics 9 (Thermal Physics) (Spring/2)

5 hours per week; 13 weeks/4th semester; 26L/13T/26LAB; ECTS credits:6

Temperature and equilibrium, reversible process and work, thermodynamic laws, Clausius inequality and entropy, microstates and macrostates, statistical weight and entrophy, equilibrium of an isolated system, equilibrium of a system in a heat bath, the partition function and the Boltxmann distribution, equivalence of thermodynamic and statistical quantities, thermodynamic potentials and Maxwell relations, magnetic systems, radiation, rubber, electrlolytic cells, change of phase and chemical potentially, heat capacities and solids, perfect quantal gas, Planck's law, Gibbs distribution FD and BE distributions.

PH4202   Physics 4 (Sound/Light)   (Spring/1)

2 hours per week; 13 weeks/2nd semester; 26L; ECTS credits:6

Wave motion: waves; SHM; pendulum; damping and resonance; beats; Doppler Effect; sound: characteristics of sound waves; microphone; speakers; the ear and hearing; ultrasound; light; nature of light: electromagnetic spectrum; photoelectric effect; sources of light, UV, visible and IR, He-Ne LASER, LED's; geometrical optics; reflection; refraction; total internal reflection; mirrors; prisms and lenses; physical optics; interference; diffraction; diffraction gratings; polarisation; optical systems.

PH4205   Applied Optics 2   (Spring/3)

3 hours per week; 13 weeks/5th semester; 26L/13T; ECTS credits:6

Lasers: fundamentals of laser action; laser cavities; laser media; gain; losses; cavity line widths; broadening mechanisms; spatial and temporal properties; Gaussian beams; laser cavity; modes; mode locking and Q switching; solid state lasers; holography and holographic techniques; laser applications. *Prerequisite PH4203*

PH4208 Advanced Applications of Physics (Spring/4)

3 hours per week; 13 weeks/8th semester; 26L/13T; ECTS credits:6

Laser applications; lasers in industrial and medical applications; measurements involving electromagnetic waves; waveguides and cavities; magneto-optical data storage; agnetoelectronics; ion beams. *Prerequisite PH4205, PH4308*

PH4217 Integrated Optics (Spring/)

3 hours per week; 13 weeks/7th semester; 26L/13T; ECTS credits:6

Integrated optics: optical waveguide modes; theory of optical waveguides; waveguide fabrication techniques; losses in optical waveguides; input and output couplers; coupling between waveguides; electro-optic modulators;

acousto-optic modulators; light emissions in semi-conductors; semi conductor lasers; heterojunction lasers; distributed feedback lasers; direct modulation of semiconductor lasers; integrated optic detectors; quantum well devices; applications of integrated topics.
Prerequisite PH4205

PH4302   Physics 5 (AC Circuits) (Spring/1)

5 hours per week; 13 weeks/2nd semester; 39L/26LAB; ECTS credits:6

Self inductance, Faraday's and Lenz's laws A.C. generatio; the A.C. generator, trigonometric form for A.C. signals, amplitude, frequency and phase. Reactanc; current and voltage relationships for R, L and C with A.C. signals, amplitude, frequency and phase. Complex analysis; complex numbers applied to A.C. circuits, complex impedance. Frequency reponse; simple low and high pass R-C circuits. Tuned circuits; series and parallel, Q, circulating current in parallel tuned circuit. Maximum power transfer theorem for complex impedances. Matrix analysis. Coupled circuits; mutual inductance, properties of coupled circuits (k<1), reflected impedance, transfer properties. Magnetic Circuit, the ideal transformer, transfer properties, use for power matching.

PH4304 Electricity & Magnetism 2   (Spring/2)

2 hours per week; 13 weeks/4th semester; 26L; ECTS credits:6

Electrostatics; electric field, force and calculation of electric field for various change distributions; electric flux and Gauss's law; differential and point form of Gauss's Law, electric potential and potential difference; calculation of potentials, potential gradient; dielectrics in electrostatic fields; polarisation and electric displacement vector, capacitance, capacitors and electrostatic energy; solution of electrostatic problems: Poisson's and Laplace's equation; magnetostatics: magnetic fields and induction, magnetizable media, magnetic force and torque, calculation of B vector, Biot-Savart Law, Ampere's Law; curl of magnetic field, magnetic dipole, scalar and vector magnetic potentials, magnetization and equivalent current densities; magnetism in matter; ferromagnetism and hysteresis; time varying fields: Faraday's and Lenz's law of electromagnetic induction, moving conductor in a static magnetic field, moving circuit in a time varying magnetic field; conduction and displacement current; equation of continuity; AC circuits. *Prerequisite PH4301*

PH4404   Physics 10 (Space and Time (Spring/2)

2 hours per week; 13 weeks/4th semester; 26L; ECTS credits:6

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. Quantum Mechanics. Review of the hydrogen atom, orbital and intrinsic angular momentum, the spin-orbit interaction and fine structure. The Pauli Exclusion Principle and many-electron atoms. Introduction to atomic spectra. Molecules, molecular vibrations and rotations, introduction to molecular spectra. Introduction to quantum statistics. Nuclear Physics. Nucleons and nuclear models, nuclear spin. Nuclear reactions and cross-sections. Introduction to elementary particles and the Standard Model. *Prerequisite PH4402*

PH4512   Introduction to Devices   (Spring/1)

4 hours per week; 13 weeks/2nd semester; 39L/13LAB; ECTS credits:6

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.Semiconductor devices; L.D.R. and thermistor, junction diode, zener diode, L.E.D. and applications; the bipolar transistor, transistor action, applications; the field effect transistor, JFET, MOSFET, characteristics and application in simple circuits. Electronic logic: truth tables, logic gates and their implementation, Boolean algebra; sequential logic, the SR flip-flop, the D flip-flop, counters and timers; introduction to digital memory, registers, elementary programming.

PH4522 Techniques in Experimental Physics (Spring/1)

4 hours per weeks; 13 weeks/2nd semester; 39L/13LAB; ECTS credits:6

Measurement techniques and instruments. Vernier scales and applications; electrical instruments, the C.R.O., digital and analog instruments. The presentation of laboratory reports, maintaining a laboratory notebook, keeping records. The presentation of data; tables, histograms. Analysis of data; graph drawing, log-linear and log-log graphs, linearisation, the method of least squares. The causes of experimental error; accuracy and precision, systematic and random errors; combination and propagation of error, significant figures. Elementary statistical treatment of random errors; standard deviation and standard error, the standard and Gaussian distributions. Using the personal computer; PC operating environments, practice in the use of word processing, spreadsheets and graphics packages, databases; use of the PC for data acquisition, computer assisted experimentation.

PH4608 Solid State Physics 2*   (Spring/4)

5 hours per week; 13 weeks/8th semester; 26L/13T/26LAB; ECTS credits:6

Properties of semiconductors; carrier densities and Fermi level position; transport properties; mobility; diffusion constant and lifetime; law of mass action; Einstein equation; continuity equation; solid state devices; junction diodes; bipolar transistor; transistor parameters; MOS capacitor; MOSFET; characteristic equations; microwave devices; TEDs; IMPATT diodes; photonic devices. *Prerequisite PH4607*

PH4704 Instrumentation 1*   (Spring/2)

5 hours per week; 13 weeks/4th semester; 26L/13T/26LAB; ECTS credits:6

General principles; units and standards. Static characteristics of measurement systems]: range; span; linearity; hysteresis; resolution; error bands. Bridges: the potential divider; bridge design; transformer bridge; active bridges. General purpose measurement system elements; resistive; semiconducting; capacitive; inductive; thermoelectric; elastic; and piezoelectric. Operational amplifiers: the ideal operational amplifier; operational feedback; the two basic operational feedback circuits; closed loop gain. Ideal op-amp circuits]; current to voltage converter/voltage to current converter; voltage/current adder; subtractor; buffer; integrator. Real op-amps: performance parameters; negative feedback; frequency response characteristics; offsets; bias current; drift. Differential amplifiers]; differential input configurations.

Current sources and sinks. Non-linear circuits; log amplifier; Schmitt trigger circuits; oscillators. Signal conditioning and signal processing elements]; data presentation/display. *Prerequisite PH4702*

PH4718 Sensors (Spring/4)

5 hours per week; 13 weeks/8th semester; 26L/13T/26LAB; ECTS credits:6

Sensor materials; lithium niobate; conducting polymers; metal oxides; doped glass fibres; ceramics; silicon; enzymes; antibodies; semiconducting oxides; basic processes of sensor behaviour; characteristics; surface and bulk properties; effects of ambients on sensor response; role of precious metal catalysts; silicon sensors; exploitable sensors; sensor technology; thin film and thick film technology; micromachining technology; sensor interfaces and bus systems; sensor structures; conductance cell; diode structures,ISFET, CHEMFET,SAW; optical fibre sensors; use for chemical and physical sensoring. *Prerequisite PH4607*

PH4828 Computational Physics (Spring/4)

5 hours per week; 13 weeks/8th semester; 26L/13T/26LAB; ECTS credits:6

Potential and fields; optimisation; data analysis and compression; waves; compuctional fluid mechanics; *Prerequisite Computational Physics I*

EQ2002 Horsemanship 2   (Spring/1)

5 hours per week; 13 weeks/2nd semester; 26L/39LAB; ECTS credits:6

Principles of training with reference to exercise physiology and its application to the horse. Riding techniques and specific training methods.

EQ2102 Horsemanship 2A (Spring/1)

5 hours per week; 13 weeks/2nd semester; 26L/39LAB; ECTS credits:6

Principles of training with reference to exercise physiology and its application to the horse. Riding techniques and specific training methods Teaching the beginning and novice riders; pupil/teacher interactions. Safety considerations.

EQ3006 Problem Identification & Practical Solutions

This module develops the material included in the module advanced riding techniques and problem analysis through practical and exploitation of the principles and practices promoted there: emphasis will be placed on the importance of identifying root causes of incorrect performance, resistance and evasion; methods of teaching advanced riding techniques.

EQ4002 Equine Exercise Science 1 (Spring/1)

5 hours per week; 13 weeks/2nd semester; 26L/39LAB; ECTS credits:6

Principles of training with particular reference to exercise physiology and its application to the equine athlete. Riding techniques and specific training methods. Analysis and evaluation of the physical parameters associated with the different types of sport horse competition. Riding theories

EQ4004 Equine Management (Spring/2)

5 hours per week; 13 weeks/4th semester; 26L/39LAB; ECTS credits:6

Lungeing and long-reining the young horse. Care, maintenance and fitting of equipment, grooming, hygiene, clipping, trimming and plaiting. Preparing the horse for sale. Shoeing and foot care. Bandaging, Equine first aid. Knowledge of and the practical administration of medication. Therapeutic treatments of injuries. Preparation for travelling the horse by road, sea and air. Construction and maintenance of artificial and natural riding surfaces.

EQ4008 Equine Teaching Principles 2 (Spring/4)

5 hours per week; 13 weeks/8th semester; 26L/39LAB;ECTS credits:6

Knowledge of the requirements and rules of various types of 'competition' disciplines. Methods of improving the skills of horse and rider. Methods of producing the mental and physical preparedness needed for competition by horse and rider. Sports Psychology. The communication triangle - coach, pupil, horse.

EQ4018 Equine Competition 2 (Spring/4)

5 hours per week; 13 weeks/8th semester; 26L/39LAB; ECTS credits:6

Study of the different international schools of dressage training and trainers. Evaluation of different international events. trainers and their methods. Analysis of different types and levels of show jumping competition and the specialist training needed. The theory and practice of course building and fence structure.

EV4004 Equine Reproduction and Management of Mares and Stallions   (Spring/2)

4 hours per week; 13 weeks/4th semester; 26L/26LAB; ECTS credits:6

Factors affecting selection of equine breeding stock. Breeding practices. Management of equine breeding stock. Parturition and care of the neonate and dam. Lactation in the mare. Artificial Insemination and pregnancy diagnosis. Infertility, pregnancy failure

EV4008 Equine Genetics*   (Spring/4)

4 hours per week; 13 weeks/8th semester; 26L/26LAB; ECTS credits:6

Review of basic genetics; genetics of evolution and speciation; genetics and anima; disease; genetics and breed improvement. *Prerequisite BY4001*

EV4012 Equine Anatomy and Physiology (Spring/1)

4 hours per weeks; 13 weeks/2nd semester; 26L/26LAB; ECTS credits:6

The anatomy of the horse with reference to the musculoskeletal structure and organs. The main systems of the horse; digestive, respiratory, circulatory, reproductive, urinary, nervous and immune. Consideration of the theoretical background to the use and operation of modern diagnostic/treatment equipment.

EV4014 Equine Nutrition*   (Spring/2)

4 hours per week; 13 weeks/4th semester; 26L/26LAB; ECTS credits:6

Principal feedstuffs, composition, analysis and energy values; feeding principles; nutrient requirements of barren, pregnant and lactating mares; nutrient requirement of horses/ponies in training, convalescent, etc. Nutrient requirements of the orphan foals. *Prerequisite EV4001*

EV4018 Equine Health and Behaviour   (Spring/4)

4 hours per week; 13 weeks/8th semester; 26L/26LAB; ECTS credits:6

Performance-related conditions. Current thinking in exercise physiology. Evaluation of performance. Acid-base balance and electrolyte disturbances. Muscle disorders. Exercise induced pulmonary haemorrhage. Transportation of horses. Normal pattern of behaviour and behavioural problems. Horse selection and well-being. Evaluation. Domestication.

EV4022 Equine Anatomy & Physiology (Cert) (Spring/1)

The anatomy of the horse; the main systems of the horse; digestive, respiratory, circulatory, including lymphatics; reproductive including embryology and physiology of reproduction; urinary; nervous and immune; consideration of the theoretical background to the use and operation of modern diagnostic/treatment equipment

FT4414 Food Technology 2 (Spring/4)

7 hours per week; 13 weeks/4th semester; 26L/26T/39LAB; ECTS credits:6

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.

FT4418 Food Technology 5 (Spring/4)

2 hours per week; 13 weeks/8th semester; 26L; ECTS credits:6

Soils and plant nutrition; 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.

FT4428 Advanced Food Chemistry   (Spring/4)

4 hours per week; 13 weeks/8th semester; 26L/26LAB; ECTS credits:6

Detailed treatment of the biochemistry 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.

FT4438 Food Microbiology (Spring/4)

4 hours per week; 13 weeks/8th semester; 26L/26T; ECTS credits:6

Roles of major families of micro organisms in food preservation/spoilage, food fermentation and public health; isolation and characterisation; microbial testing and control in food products; HACCP and quality systems; foodborne pathogens of current concern including listeria monocytogenes, psychrophilic C, botulinum, aeromonas, yershinia, bacillus cereus, salmonella.

FT4448 Food Technology 6   (Spring/4)

3 hours per week; 13 weeks/8th semester; 26L/13T; ECTS credits:6

Implications of technologies used in agriculture and by the food industry for consumer health; potential hazards associated with residues of agricultural chemicals/veterinary products; toxicological and nutritional implications of food processing; control systems needed to ensure consumer health and to ensure consumer confidence.

HC4304 Horticulture 1 (Spring/2)

5 hours per week; 13 weeks/4th semester; 26L/13T/26LAB; ECTS credits:6

Physiological and environmental plant growth factors; micro propagation; vegetative propagation; seed propagation; seed dormancy; pruning; insect, disease and weed identification/control; organic growing; marketing.

PH4002   General Physics 2   (Spring/1)

5 hours per week; 13 weeks/2nd semester; 26L/13T/26LAB; ECTS credits:6

Heat; laws of thermodynamics; Carnot cycles; entropy; heat transfer; Stefan-Boltzmann law; wave motion ; Doppler effect; sound; light; the electromagnetic spectrum; sources of light, UV, visible and IR;He-Ne LASER; geometical optics; physical optics; optical systems.

PH4012 Physics for Engineers 2 (Spring/1)

5 hours per week; 13 weeks/2nd semester; 26L/13T/26LAB; ECTS credits:6

Heat; laws of thermodynamics; heat capacities; Carnot cycles entropy; heat transfer; Stefan-Boltzmann law; wave motion; Doppler effect; sound; light; electromagnetic spectrum; source of light, UV, visible and IR; geometrical optics; physical optics; optical systems. *Prerequisite: PH4011*

PH4104 Physics 9 (Thermal Physics) (Spring/2)

5 hours per week; 13 weeks/4th semester; 26L/13T/26LAB; ECTS credits:6

Temperature and equilibrium, reversible process and work, thermodynamic laws, Clausius inequality and entrophy, microstates and macrostates, statistical weight and entrophy, equilibrium of an isolated system, equilibrium of a system in a heat bath, the partition function and the Boltxmann distribution, equivalence of thermodynamic and statistical quantities, thermodynamic potentials and Maxwell relations, magnetic systems, radiation, rubber, electrlolytic cells, change of phase and chemical potentially, heat capacities and solids, perfect quantal gas, Planck's law, Gibbs distribution FD and BE distributions.

PH4202   Physics 4 (Sound/Light)   (Spring/1)

2 hours per week; 13 weeks/2nd semester; 26L; ECTS credits:6

Wave motion: waves; SHM; pendulum; damping and resonance; beats; Doppler Effect; sound: characteristics of sound waves; microphone; speakers; the ear and hearing; ultrasound; light; nature of light: electromagnetic spectrum; photoelectric effect; sources of light, UV, visible and IR, He-Ne LASER, LED's; geometrical optics; reflection; refraction; total internal reflection; mirrors; prisms and lenses; physical optics; interference; diffraction; diffraction gratings; polarisation; optical systems.

PH4205   Applied Optics 2   (Spring/3)

3 hours per week; 13 weeks/5th semester; 26L/13T; ECTS credits:6

Lasers: fundamentals of laser action; laser cavities; laser media; gain; losses; cavity line widths; broadening mechanisms; spatial and temporal properties; Gaussian beams; laser cavity; modes; mode locking and Q switching; solid state lasers; holography and holographic techniques; laser applications. *Prerequisite PH4203*

PH4208 Advanced Applications of Physics (Spring/4)

3 hours per week; 13 weeks/8th semester; 26L/13T; ECTS credits:6

Laser applications; lasers in industrial and medical applications; measurements involving electromagnetic waves; waveguides and cavities; magneto-optical data storage; agnetoelectronics; ion beams. *Prerequisite PH4205, PH4308*

PH4217   Integrated Optics (Spring/)

3 hours per week; 13 weeks/7th semester; 26L/13T; ECTS credits:6

Integrated optics: optical waveguide modes; theory of optical waveguides; waveguide fabrication techniques; losses in optical waveguides; input and output couplers; coupling between waveguides; electro-optic modulators; acousto-optic modulators; light emissions in semi-conductors; semi conductor lasers; heterojunction lasers; distributed feedback lasers; direct modulation of semiconductor lasers; integrated optic detectors; quantum well devices; applications of integrated topics.
Prerequisite PH4205

PH4302 Physics 5 (AC Circuits) (Spring/1)

5 hours per week; 13 weeks/2nd semester; 39L/26LAB; ECTS credits:6

Self inductance, Faraday's and Lenz's laws A.C. generatio; the A.C. generator, trigonometric form for A.C. signals, amplitude, frequency and phase. Reactanc; current and voltage relationships for R, L and C with A.C. signals, amplitude, frequency and phase. Complex analysis; complex numbers applied to A.C. circuits, complex impedance. Frequency reponse; simple low and high pass R-C circuits. Tuned circuits; series and parallel, Q, circulating current in parallel tuned circuit. Maximum power transfer theorem for complex impedances. Matrix analysis. Coupled circuits; mutual inductance, properties of coupled circuits (k<1), reflected impedance, transfer properties. Magnetic Circuit, the ideal transformer, transfer properties, use for power matching.

PH4304 Electricity & Magnetism 2   (Spring/2)

2 hours per week; 13 weeks/4th semester; 26L; ECTS credits:6

Electrostatics; electric field, force and calculation of electric field for various change distributions; electric flux and Gauss's law; differential and point form of Gauss's Law, electric potential and potential difference; calculation of potentials, potential gradient; dielectrics in electrostatic fields; polarisation and electric displacement vector, capacitance, capacitors and electrostatic energy; solution of electrostatic problems: Poisson's and Laplace's equation; magnetostatics: magnetic fields and induction, magnetizable media, magnetic force and torque, calculation of B vector, Biot-Savart Law, Ampere's Law; curl of magnetic field, magnetic dipole, scalar and vector magnetic potentials, magnetization and equivalent current densities; magnetism in matter; ferromagnetism and hysteresis; time varying fields: Faraday's and Lenz's law of electromagnetic induction, moving conductor in a static magnetic field, moving circuit in a time varying magnetic field; conduction and displacement current; equation of continuity; AC circuits. *Prerequisite PH4301*

PH4404 Physics 10 (Space and Time (Spring/2)

2 hours per week; 13 weeks/4th semester; 26L; ECTS credits:6

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. Quantum Mechanics. Review of the hydrogen atom, orbital and intrinsic angular momentum, the spin-orbit interaction and fine structure. The Pauli Exclusion Principle and many-electron atoms. Introduction to atomic spectra. Molecules, molecular vibrations and rotations, introduction to molecular spectra. Introduction to quantum statistics. Nuclear Physics. Nucleons and nuclear models, nuclear spin. Nuclear reactions and cross-sections. Introduction to elementary particles and the Standard Model. *Prerequisite PH4402*

PH4512 Introduction to Devices (Spring/1)

4 hours per week; 13 weeks/2nd semester; 39L/13LAB; ECTS credits:6

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.Semiconductor devices; L.D.R. and thermistor, junction diode, zener diode, L.E.D. and applications; the bipolar transistor, transistor action, applications; the field effect transistor, JFET, MOSFET, characteristics and application in simple circuits. Electronic logic: truth tables, logic gates and their implementation, Boolean algebra; sequential logic, the SR flip-flop, the D flip-flop, counters and timers; introduction to digital memory, registers, elementary programming.

PH4522 Techniques in Experimental Physics (Spring/1)

4 hours per weeks; 13 weeks/2nd semester; 39L/13LAB; ECTS credits:6

Measurement techniques and instruments. Vernier scales and applications; electrical instruments, the C.R.O., digital and analog instruments. The presentation of laboratory reports, maintaining a laboratory notebook, keeping records. The presentation of data; tables, histograms. Analysis of data; graph drawing, log-linear and log-log graphs, linearisation, the method of least squares. The

causes of experimental error; accuracy and precision, systematic and random errors; combination and propagation of error, significant figures. Elementary statistical treatment of random errors; standard deviation and standard error, the standard and Gaussian distributions. Using the personal computer; PC operating environments, practice in the use of word processing, spreadsheets and graphics packages, databases; use of the PC for data acquisition, computer assisted experimentation.

PH4608 Solid State Physics 2* (Spring/4)

5 hours per week; 13 weeks/8th semester;
26L/13T/26LAB; ECTS credits:6

Properties of semiconductors; carrier densities and Fermi level position; transport properties; mobility; diffusion constant and lifetime; law of mass action; Einstein equation; continuity equation; solid state devices; junction diodes; bipolar transistor; transistor parameters; MOS capacitor; MOSFET; characteristic equations; microwave devices; TEDs; IMPATT diodes; photonic devices.
Prerequisite PH4607

PH4704 Instrumentation 1*   (Spring/2)

5 hours per week; 13 weeks/4th semester;
26L/13T/26LAB; ECTS credits:6

General principles; units and standards. Static characteristics of measurement systems]: range; span; linearity; hysteresis; resolution; error bands. Bridges: the potential divider; bridge design; transformer bridge; active bridges. General purpose measurement system elements; resistive; semiconducting; capacitive; inductive; thermoelectric; elastic; and piezoelectric. Operational amplifiers: the ideal operational amplifier; operational feedback; the two basic operational feedback circuits; closed loop gain. Ideal op-amp circuits]; current to voltage converter/voltage to current converter; voltage/current adder; subtractor; buffer; integrator. Real op-amps: performance parameters; negative feedback; frequency response characteristics; offsets; bias current; drift. Differential amplifiers]; differential input configurations. Current sources and sinks. Non-linear circuits; log amplifier; Schmitt trigger circuits; oscillators. Signal conditioning and signal processing elements]; data presentation/display. *Prerequisite PH4702*

PH4718 Sensors (Spring/4)

5 hours per week; 13 weeks/8th semester; 26L/13T/26LAB; ECTS credits:6

Sensor materials; lithium niobate; conducting polymers; metal oxides; doped glass fibres; ceramics; silicon; enzymes; antibodies; semiconducting oxides; basic processes of sensor behaviour; characteristics; surface and bulk properties; effects of ambients on sensor response; role of precious metal catalysts; silicon sensors; exploitable sensors; sensor technology; thin film and thick film technology; micromachining technology; sensor interfaces and bus systems; sensor structures; conductance cell; diode structures,ISFET, CHEMFET,SAW; optical fibre sensors; use for chemical and physical sensoring.
Prerequisite PH4607

PH4828 Computational Physics (Spring/4)

5 hours per week; 13 weeks/8th semester; 26L/13T/26LAB; ECTS credits:6

Potential and fields; optimisation; data analysis and compression; waves; computional fluid mechanics;
Prerequisite Computational Physics I

FACULTY OF ARTS, HUMANITIES AND SOCIAL SCIENCES

Dean, Professor Pat O'Connor

Mission

The mission of the Faculty of Arts, Humanities and Social Sciences is to support excellence in teaching and research within the general context of the University's overall mission statement and national needs.

Department/Faculty Information

The Faculty has five academic departments: Department of Politics and Public Administration, Department of Languages and Cultural Studies, Department of History, School of Law, Department of Sociology and provides academic support for the work of the Irish World Music Centre and the Arts Department at Mary Immaculate College.

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<u>Undergraduate Degree Programmes Offered</u>

Bachelor of Arts Joint Honours
Bachelor of Arts in Irish Traditional Music and Dance
Bachelor of Arts in New Media and English
Bachelor of Arts in Journalism and New Media
Bachelor of Arts in Irish and New Media
Bachelor of Arts in English and History
Bachelor of Arts in European Studies
Bachelor of Arts in International Insurance and European Studies
Bachelor of Arts (Education) Modern Languages
Bachelor of Arts in Public Administration
Bachelor of Laws in Law and European Studies
Bachelor of Laws (Law Plus)
Bachelor of Arts in Applied Languages
Bachelor of Arts in Language and Cultural Studies
Bachelor of Arts in History, Politics, Sociology and Social Studies
Bachelor of Arts (offered at Mary Immaculate College)
Bachelor of Arts in Irish Studies
Bachelor of Arts in Irish Music and Dance
Bachelor of Arts in Voice and Dance
Bachelor of Arts in Psychology and Sociology

Faculty of Arts, Humanities and Social Sciences – Autumn

CU4027 Visual Cultural Studies (Autumn/4)

3 hours per week;13 weeks/7th semester;26L/13T;ECTS credits:6

Visual cultural studies from the 19th to 21st centuries will be studied in this module: the theories of representation in painting , photography ,cinema, television and the internet will be centred thematically around such areas as gender, race, globalisation and virtuality.

CU4121   Introduction to New Media & Cultural Studies   (Autumn/1)

3 hours per week; 13 weeks/1st semester; 26L/13T; ECTS credits:6

This module introduces students to the fields of cultural studies to develop an understanding of culture from a European perspective. Areas covered include; the concept of culture, the English language tradition, German theories of culture, French theories of culture, gender and race, psychoanalysis, and culture and communication. Tutorials will take the theoretical aspects and apply then to present day cultural phenomena.

CU4121 Introduction to New Media and Cultural Studies (Autumn/1)

3 hours per week; 13 weeks/1st semester; 26L/13T; ECTS credits:6

This module introduces students to the fields of cultural studies to develop an understanding of culture from a European perspective. Areas covered include; the concept of culture, the English language tradition, German theories of culture, French theories of culture, gender and race, psychoanalysis, and culture and communication. Tutorials will take the theoretical aspects and apply then to present day cultural phenomena.

CU4127 Cultural Studies 5: Comparative Literature (Autumn/4)

3 hours per week; 13 weeks/7th semester; 26L/13T; ECTS credits:6

The aim of this interdisciplinary module is to examine literatures comparatively, both from the point of view of theory, and in practice. The syllabus will deal with the different issues which arise in comparing literatures; cultural similarity and diversity; nationalism; stereotypes and archetypes; post-colonialism; the use of common sources such as the classics and the Bible; cross-national literary and cultural movements such as Romanticism and Feminism; the role of translation in accessing literature; the influence of writers both inside and outside their social, national and linguistic groups; national sterotypes and clichés in literature and varying attitudes to language. A large part of the syllabus will be given over to practical applications of the issues of chosen texts.

EH4001   Critical Practice 1: Academic Reading and Writing (Autumn/1)

3 hours per week; 13 weeks/7th semester; 26L/13T; ECTS credits:6

This module aims to develop the skills of literary analysis and *academic writing*, in tandem with an understanding of literary genres and literary theory.

EH4013 Sensibility and Romanticism (Autumn/1)

3 hours per week; 13 weeks/7th semester; 26L/13T; ECTS credits:6

The aim of this course is to provide students with a survey of literature *1770* to 1830. This course aims to immerse students in the literary language of the time, and instructs them in ways to respond to this literature in ways which are critically and historically informed.

EF4021 English as a Foreign Language 1   (Autumn/1)

4 hours per week; 13 weeks/1st semester; 39T/13LAB;   ECTS

This module is intended to bring the students to a higher advanced level of proficiency in the four language skills, to advance their knowledge of English grammar, to introduce elements of socio-political and economic issues into the material for language study and to use the acculturation process as the basis for language work. It includes advanced grammar work, development of listening, reading, writing and speaking skills, debates and discussion of topical issues, exploitation of English language media and essay and report writing.

EH4003 Introduction to Literary Theory (Autumn/3)

4 hours per week;13 weeks/3rd semester;26L/26T;ECTS credits: 6

What is literature? How does the historical and social context of a work alter its meaning? What influences our understanding of a literary work?
This course examines the numerous ways in which critical theory has challenged traditional assumptions about literature. A wide range of critical approaches will be discussed, and applied to two core texts.

EH4001   Critical Practice I (Autumn/1)

4 hours per week; 13 weeks/2nd Semester; 26L/26T; ECTS credits:6

An introduction to the history, concepts and methods of literary criticism; practical criticism context and genre studies; structural and stylistic methods of analysis.

EH4111 The Irish Literary Revival (Autumn/1)

4 hours per week; 13 weeks/1st semester; 26L/26T; ECTS credits:6

The course examines Irish writing in English at a crucial stage in its development. It concentrates on poetry and drama with special attention being given to the work of W.B. Yeats; the fiction-writing tradition is also studied. Background and context form an integral part of the course.

EH4013 Sensibility and Romanticism   (Autumn/2)

3 hours per week; 13 weeks/3rd semester; 26L/13T; ECTS credits:6

This course will concentrate on a selection from the poetry and critical writings of Blake, Wordsworth, Coleridge, Byron, Shelley , Keats and Clare; the prose of Dorothy Wordsworth; one novel of the period; the historical, political and social contexts of the movement, and their parallels on Europe and the U.S.A.

EH4118   Literary Theory (Autumn/4)

3 hours per week; 13 weeks 8th Semester 26L/13T; ECTS credits:6

Russian formalism; the linguistics model of de Saussure and Jakobson; hermeneutics; Cambridge English, new criticism, Marxist criticism; reader-response, structuralism, post-structuralism, feminism, deconstruction.

EH4158   From James Joyce to Maeve Brennan: 20th Century Irish Fiction   (Elective Autumn/4)

3 hours per week; 13 weeks 8^h Semester 26L/13T; ECTS credits:6

This module provides a critical examination of twentieth century Irish fiction, encompassing authors such as James Joyce, Elizabeth Bowen, Frank O'Connor, Kate O'Brien, and their less well-known counterparts such as the recently rediscovered Maeve Brennan. We will address the intersection of Irish cultural and social identities in these texts, examine efforts to create an 'Irish national culture' in the period, and construct readings of this literature through contemporary perspectives in literary and cultural theory.

EH4145   American Literature (Autumn/3)

3 hours per week; 13 weeks/5th semester; 26L/13T; ECTS credits:6

A study of major texts in American literature, seventeenth century to present day; concepts of colonial and post colonial writing; the relationship between literature and history; Issues of language and identity

FR4141   French Language and Society 1: Introduction to French Studies (Autumn/1)

4 hours per week; 13 weeks/1st semester; 13L/26T/13LAB; ECTS credits:6

Textual analysis and commentary, translation, summary and essay writing in the context of a variety of issues relevant to contemporary French culture and society; development of oral skills and listening comprehension; revision of all basic grammatical structures of French through the texts analysed in class; development of autonomous language-learning skills.

FR4143 French Language and Society 3: Education and Work Environment in France (Autumn/2)

4 hours per week; 13 weeks/3^{rdt} semester; 13L/26T/13LAB; ECTS credits:6

Introduction to aspects of the world of work in France: course work will include letter writing preparation of dossiers on specialist topics economic and commercial translation role plays involving telephone conversations interviews presentations etc.

FR4147 French Language and Society 5: France, Europe and Beyond   (Autumn/4)

4 hours per week; 13 weeks/3^{rdt} semester; 13L/39T; ECTS credits:6

Introduction to key moments in the history of France in European affairs and that of France with the francophone communities language varieties in France and the francophone countries: this will be done through the study of a variety of texts and will provide the basis for language activities including reading and linguistic analysis of authentic texts, development of written skills discussion and debate oral presentations and translation of authentic texts: in addition students will study a work of literature from a francophone country.

FR4241   French Language, Culture and Society 1: Introduction to French Studies   (Autumn/1)

3 hours per week; 13 weeks/1st semester; 26L/13T; ECTS credits:6

Textual analysis and commentary, translation, summary and essay writing in the context of a variety of issues relevant to contemporary French culture and society; development of oral skills and listening comprehension; revision of all basic grammatical structures of French through the texts analysed in class; development of autonomous language-learning skill*s*

EH4145   American Literature (Autumn/3)

3 hours per week; 13 weeks/5th semester; 26L/13T; ECTS credits:6

A study of major texts in American literature, seventeenth century to present day; concepts of colonial and post colonial writing; the relationship between literature and history; Issues of language and identity

FR4141   French Language and Society 1: Introduction to French Studies (Autumn/1)

4 hours per week; 13 weeks/1st semester; 13L/26T/13LAB; ECTS credits:6

Textual analysis and commentary, translation, summary and essay writing in the context of a variety of issues relevant to contemporary French culture and society; development of oral skills and listening comprehension; revision of all basic grammatical structures of French through the texts analysed in class; development of autonomous language-learning skills.

FR4143 French Language and Society 3: Education and Work Environment in France (Autumn/2)

4 hours per week; 13 weeks/3^{rdt} semester; 13L/26T/13LAB; ECTS credits:6

Introduction to aspects of the world of work in France: course work will include letter writing preparation of dossiers on specialist topics economic and commercial translation role plays involving telephone conversations interviews presentations etc.

FR4147 French Language and Society 5: France, Europe and Beyond   (Autumn/4)

4 hours per week; 13 weeks/3^{rdt} semester; 13L/39T; ECTS credits:6

Introduction to key moments in the history of France in European affairs and that of France with the francophone communities language varieties in France and the francophone countries: this will be done through the study of a variety of texts and will provide the basis for language activities including reading and linguistic analysis of authentic texts, development of written skills discussion and debate oral presentations and translation of authentic texts: in addition students will study a work of literature from a francophone country.

FR4241   French Language, Culture and Society 1: Introduction to French Studies   (Autumn/1)

3 hours per week; 13 weeks/1st semester; 26L/13T; ECTS credits:6

Textual analysis and commentary, translation, summary and essay writing in the context of a variety of issues relevant to contemporary French culture and society; development of oral skills and listening comprehension; revision of all basic grammatical structures of French through the texts analysed in class; development of autonomous language-learning skill*s*

FR4243   French 3A (AL) (Autumn/2)

4 hours per week; 13 weeks/3rd semester;26L/26T; ECTS credits:6

Introduction to aspects of the world of work in France; letter-writing, preparation of dossiers on specialist topics, economic and commercial translation, role plays involving telephone conversations, interviews, presentations.
Prerequisite FR4222

FR4247 French Language, Culture & Society 5 (Autumn/4)

4 hours per week; 13 weeks/7th semester; 13L/39T; ECTS credits:6

Development of language skills through reading and analysis written and oral of authentic texts: the role of France in European affairs: the francophone communities; current issues in Translation Studies: practice in translation in a variety of areas as technology international affairs commerce: Prerequisite FR4246

FR4321 French for Business 1   (Autumn/1)

4 hours per week; 13 weeks/1st semester; 26L/26T; ECTS credits:6

Use of authentic material both written and oral; tasks encountered in specific situations; focus is in the following areas; organisational structures of firms, advertising, personnel management.
N.B. these modules are not suitable for French-speaking students

FR4323 French for Business 3   (Autumn/2)

4 hours per week; 13 weeks/3rd semester; 26L/26T; ECTS credits:6

Use of authentic material (both written and oral) for tasks encountered in specific situations; focus is in the following areas; communication network, transportation, insurance.

FR4421   French for Engineers 1A (Autumn/1)

4 hours per week; 13 weeks/1st semester; 26L/26T; ECTS credits:6

Written and oral French in every day communication situations; essential grammatical structures and basic vocabulary. Introduction to cross-cultural awareness through audio-visual and newspaper materials; introduction to self-access material(CALL).

FR4423   French for Engineers 3A (Autumn/2)

4 hours per week; 13 weeks/3rd semester; 26L/26T; ECTS credits:6

Broadening of cross-cultural awareness through examples drawn from the French higher education system in the fields of Engineering and Science. Stress on functional skills in relation to French university / technical college programmes; development of CALL to elicit information from general and more technical text.

FR4511 French for Computing 1   (Autumn/1)

4 hours per week; 13 weeks/1st semester; 26L/26T; ECTS credits:6

Development of oral and written skills by means of practical exercises including debates, presentations and essay writing; detailed review of the basic grammatical structures of French; introduction to basic computing terminology in French through the study of general and specialised texts on computing-related topics; study of contemporary French society and culture and the major issues influencing that society; exploration of strategies for effective language learning and development of skills for autonomous learning.

FR4515 French for Computing 3 (Autumn/3)

4 hours per week; 13 weeks/5thsemester; 26L/26T; ECTS credits:6

The purpose of this module is to introduce students to the structures, business philosophies and working practices of francophone computing companies in particular those companies dealing with e-commerce and m-commerce. Upon completion of the module all students should be able to:maintain and develop a high-level of spoken and written French. *Prerequisite FR4511*

FR4517 French for Computing 5 (Autumn/4)

4 hours per week; 13 weeks/7th semester; 13L/26T/13LAB ; ECTS credits:6

The purpose of this module is to investigate and to define the importance and influence of particular types of francophone cybercultures. These types of cybercultures will be examined through the study of prominent contemporary francophone authors and from the following atandpoints; educational, social, political and cultural.
Prerequisite FR4515

FR4621   Literature and Culture 1 Twentieth-Century Literature in French 1: 1900-1945 1-2-1 (Autumn/1)

4 hours per week; 13 weeks/1st semester; 13L/26T/13LAB; ECTS credits:6

Four literary texts will be studied; works by authors such as the following will be included: Mauriac, Gide, Colette, Giraudoux, Apollinaire, Damas.

FR4623 French Literature & Culture 3: The Enlightenment in France (Autumn/2)

3 hours per week; 13 weeks/3rd semester; 26L/13T; ECTS credits:6

The module will concentrate on the following themes in a variety of texts: the cosmopolitan enlightenment campaign for toleration optimism the philosophies and the encyclopaedia debate on inequality.

FR4627 French Literature and Culture 5: Intellectual Movement (Autumn/4)

3 hours per week; 13 weeks/7th semester; 26L/13T; ECTS credits:6

Two/three areas will be chosen each year from among the following and a variety of theoretical and literary texts will be addressed: existentialism ii structuralism/semilogy iii post modernism iv feminist theory.

FR4921   French for Business* 1A (Autumn/1)

4 hours per week; 13 weeks/1st semester; 26L/26T; ECTS credits:6

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; focus is in the following areas; means of payment, organisational structures of firms, Company types.

FR4923   French for Business 3A (Autumn/2)

4 hours per week; 13 weeks/3rd semester; 26L/26T; ECTS credits:6

The use of authentic material (both Written and oral) to increase proficiency in relevant work situations which the students are likely to encounter during their professional activity; focus is on communication networks, insurance and advertising.
Prerequisite FR4922

FR4925   French for Business 5A (Autumn/3)

4 hours per week; 13 weeks/5th semester; 26L/26T; ECTS credits:6

This module entitled 'Le monde du travail' focuses on the organisational structure of a cross section of French firms and the functions of their various departments; it includes the development of trade unions and the relationship of the social partners; students are asked to participate in a case study involving industrial issues. *Prerequisite FR4924*

FR4927   French for Business 7A (Autumn/4)

4 hours per week; 13 weeks/7th semester; 26L/26T; ECTS credits:6

"La region et l'Europe"; the socio-economic identity of the regions of France; study of decentralisation and regionalisation; the techniques necessary to give a detailed presentation of an economic issue through the use of statistics, graphs and key economic phrases.
Prerequisite FR4925

GA4105 Irish Folklore 1 (Autumn/3)

4 hours per week; 13 weeks/4th Semester; 26L/26T; ECTS credits:6

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; traditional custom and belief including calendar customs. A case study in folklore collection based on field recordings made in county Limerick in 1980.

GA4115 Irish Language 1   (Autumn/3)

5 hours per week; 13 weeks 4th Semester; 26L/39T; ECTS credits:6

An introductory course in communicative Irish, the language content of which is based on scientific research on frequencies of lexis, verbal forms and syntactical patterns in conversational Irish; the external history of the Irish language; introduction to early Irish literature.

GA4133 Litríocht agus Saíocht 1 : 1890-1940 (Autumn/2)

3 hours per week; 13 weeks/3rd semester; 26L/13T; ECTS credits:6

Sa bhreis ar a mbeadh léite ó thaobh na litríochta de i Modúl GA4121, go gcothófaí teagmháil an mhic léinn le tuilleadh nualitríochta ó thús ré na hAthbheochana go 1940 (gearrscéalta, úrscéalta, filíocht), chomh maith le drámaí; go gcothófaí scileanna anailíse agus léirmheastóireachta na litríochta.

GA4138 Litriocht agus Saiocht 4: Schribhneoiri na Gaeltac (Autumn/4)

3 hours per week; 13 weeks/8th semester; 26L/13T; ECTS credits:6

Rang teagaisc: Saothair roghnaithe de chuid na litríochta comhaimseartha a scríobhadh sa Ghaeltacht, nó a scríobh údair na Gaeltachta; prós, filíocht, aistí ar chúrsaí reatha, spóirt agus araile; dúchas litríochta na Gaeilge sa lá atá inniu ann. *Léachtaí:* Leabhair agus ailt roghnaithe de chuid mórscríbhneoirí na Gaeltachta; Máirtín Ó Cadhain, Seosamh Mac Grianna, Donncha Ó Ceilleachair san áireamh; iniúchadh ar théamaí agus ar stíl a gcuid saothar; buanna, laincaisí agus oidhreacht na n-údar Gaeltachta.
Prerequisite:GA4126

GA4141   Teanga, Sochaí agus Saíocht 1 (Autumn/1)

5 hours per week; 13 weeks/1st semester; 26L/39T; ECTS credits:6

Go dtiocfadh na mic léinn ar thuiscint ar ghnéithe de shaol comhaimseartha agus d'oidhreacht na Gaeilge, agus go mbeadh ar a gcumas bunGhaeilge a labhairt agus a scríobh go cruinn agus go nádúrtha ar thopaicí a bhaineann lena gcúlra féin, lena n-ábhair suime agus le saol na hOllscoile; agus go bhforbrófaí scileanna léamhthuisceana an mhic léinn aonair ar chorpas léitheoireachta sa nua-theanga.

GA4143 Teanga, Sochaí agus Saíocht 3 (Autumn/2)

4 hours per week; 13 weeks/3rd semester; 26L/26T; ECTS credits:6

Go dtuigfeadh an mac léinn an teagmháil daingean idir na Gaeil agus an Mhór-Roinn agus Meiriceá Thuaidh agus Theas; oidhreacht Ghaelach na hEorpa agus Mheiriceá; go mbeadh cur amach leathan ag an mac léinn ar shaíocht na Gaeilge agus ar shaol na nGael sa 17ú agus san 18ú hAois, agus ar shaibhreas thraidisiún na n-amhrán; forbairt, leathnú, saibhriú ar ábhar teanga na modúl i mBliain 1; forbairt na téarmaíochta do théamaí sóisialta, polaitíochta agus stair na hÉireann agus na hEorpa.

GA4147   Teanga, Sochaí agus Saíocht 5   (Autumn/4)

5 hours per week; 13 weeks/7th semester; 26L/39T; ECTS credits:6

Go mbeadh ar chumas an mhic léinn an Ghaeilge a ionramháil go cruinn nádúrtha i réimse leathan ábhar, agus go háirithe go mbeadh máistreacht aige ar na téamaí Gaeilge a bhaineann le hábhair eile a chéime; go mbeadh an mac léinn in ann an Caighdeán oifigiúil a úsáid agus a mhíniú; go mbeadh tuiscint ag an mac léinn ar dhán comhaimseartha na Gaeilge in Éirinn idir shocheolaíocht

agus pholaitíocht teanga; go mbeadh máistreacht ag an mac léinn aonair ar scileanna an aistriúcháin.

GA4153 Litríocht agus Saíocht 1250-1690 (Autumn/2)

3 hours per week; 13 weeks/3rd semester; 39L; ECTS credits:6

Lorg na luath-Ghaeilge ar an teanga chomhaimseartha; comhthéacs stairiúil agus sóisialta na litríochta Gaeilge a scríobhadh idir 1250 agus 1650. Léachtaí: An amour courtois i litríocht na Gaeilge; na dánta agus na hamhráin ghrá; Cúirt an Mheáin-Oíche; Caoineadh Airt Uí Laoghaire; litríocht na mban agus íomha na mná sa litríocht; Parlaimint na mBan.

EH4158 From James Joyce to Maeve Brennan: 20th century Irish Fiction (Autumn/4)
3hours per week;13 weeks/8th semester;26L/13T;ECTS credits:6

This module studies authors such as James Joyce, Elizabeth Bowen, Frank O'Connor, Kate O'Brien, and their less well-known counterparts such as the recently rediscovered Maeve Brennan. We will address the intersection of Irish cultural and social identities and these texts, examine efforts to create an 'Irish national culture' in the period, and construct readings of this literature through contemporary perspectives in literary and cultural theory. The course provides a critical examination of twentieth century Irish fiction.

GE4141 German Language and Society 1 (Autumn/1)

3 hours per week; 13 weeks/1st semester; 13L/26T/13LAB; ECTS credits:6

Lecture: The German language, its history and relationship with other languages; political geography of the German-speaking countries; historical background to present day Germany, focus on 1871 to 1939
Tutorials: a) reading of literary texts to provide further access to the period while at the same time introducing reading techniques, principles of textual analysis and text discussion in oral and written form; b) contrastive grammar work: grammatical categories and terminology, graded English/German translation exercises, grammar in use/communicative grammar.
Language laboratory: exercises in pronunciation, listening comprehension and grammar utilizing CALL facilities.

GE4211 German for beginners (Autumn/1)

6hours/per/week;13weeks/1st semester;13L/13T/4L;ECTS credits:6

The German language, its history and relationship with other languages; political geography of the German speaking countries; sociocultural and historical background to the German-speaking countries of Europe in the 19th and early 20th century; introduction to the concepts of gender, number and case and to the basic structures of the German language; German poetry and short stories; approaches to language learning, including developments of autonomous learning skills, exploitation of reference material and dictionaries, etc.; use of all laboratory facilities in their private language study.

GE4143 Living and working in Germany (Autumn/2)

3 hours per week; 13 weeks/2nd semester; 26L/13T; ECTS credits:6

Lecture: education environment: the educational system, universities and university life, the legacy of 1968; work environment: vocational education, industrial relations, company structures, trade unions, working in the east; working in the west; the legacy of state socialism; xenophobic tendencies; Germany as a multicultural nation.
Tutorials: a) discussion of authentic text material and a novel to support the lecture, focus on the development of writing skills and cultural awareness; b) grammar in context.
Language laboratory: CALL exercises; language related exercises based on German TV programmes dealing with the issues covered in the lecture.

GE4147 Germany, Europe and Beyond (Autumn/4)

Lecture: the debate about European unification; Germany and its neighbours; Germany and the Third World; German economic and cultural activities abroad; the image of Germany abroad and the German self-image; German/Irish relations.
Tutorials: a) discussion of texts connected with the lecture b) contrastive cultural studies including students' presentations in the foreign language; c) graded translation exercises focussing on German/English translations.

GE4211 German for beginners 1 (Autumn/1)

6hours/per/week;13weeks/1st semester;13L/13T/4L;ECTS credits:6

The German language, its history and relationship with other languages; political geography of the German speaking countries; sociocultural and historical background to the German-speaking countries of Europe in the 19th and early 20th century; introduction to the concepts of gender, number and case and to the basic structures of the German language; German poetry and short stories; approaches to language learning, including developments of autonomous learning skills, exploitation of reference material and dictionaries, etc.; use of all laboratory facilities in their private language study.

GE4213 German for beginners 3

6 hours per week;13 weeks/1st semester;13L/13T/52L'ECTS credits: 6

The educational system, universities and university life; vocational education, industrial relations, company structures, trade unions; Germany as a multicultural nation; completion of basic structures and vocabulary of the German language, focusing particularly on grammar and lexis in context; consolidation of skills,, focusing particularly on the development of speaking and writing skills and cultural awareness; German Erzählung and novel; preparation for living and working/studying in a German-speaking environment (application letters, cvs, practice of short interview situations, using the telephone, etc.)

GE4241 German language, Culture and Society 1 (Autumn/1)

3 hours per week; 13 weeks/1st semester; 26L/13T: ECTS credits:6

Lecture: The German language, its history and relationship with other languages; historical geography of the German-speaking countries; historical and cultural background to present day Germany, focus on 1871 to 1939.

Tutorial work: Grammar/translation: introduction to basic grammatical categories and terminology; consolidation of existing grammatical knowledge and expansion into more complex structures; contrastive work by means of English/German translation exercises; Text analysis & production: principles of textual analysis and text discussion (literary and non-literary); grammar in use/communicative grammar. *Laboratory*: 1 hour per week in the CALL/language laboratory will support grammar and oral work.

GE4243   German language culture & society 3 (Autumn/2)

4 hours per week; 13 weeks/3rd semester; 13L/39T; ECTS credits:6

Education environment educational systems, universities and university life, the legacy of 1968 work environment, vocational system, industrial relations, company structures, trade unions, xenophobic tendencies, Germany as a multicultural country: one hour text work, consolidates skills relating to textual analysis production, grammar in use and German-English translation one hour oral discussion presentation will also focus on authentic text material written video, etc, relating to intercultural issues adaptation and identity perceived differences in areas such as value systems social interaction etc: two short literary texts relating to lectures will also be discussed in this class and examined in the oral and written exams; one hour German linguistics continues with past and current developments in the German language: *Prerequisite GE4242*

GE4247 German language, culture and society 5 (Autumn/4)

4 hours per week; 13 weeks/7th semester; 13L/39T; ECTS credits:6

Lecture: The debate about European unification; Germany and its neighbours; Germany and the Third World; German economic and cultural activities abroad; the image of Germany abroad and the German self-image; German/Irish relations.
Tutorial work: Oral presentation & discussion class: drawing on text and audio-visual materials to develop formal oral skills (analysing tone & register; reporting and commentary); Text analysis & production: analysis & writing of commentaries and critiques; Translation theory and practice: scientific, technical and legal texts.
Literature reading course: Students will read two pieces of literature related to the theme of the lecture. This will form the basis of 2 weeks oral discussion work and one essay in German.

GE4321 German for Business 1 (Autumn/1)

4 hours per week; 13 weeks/ 1st semester; 26L/26T; ECTS credits:6

Oral communicative skills; introduction to basic grammatical structures supplemented by language laboratory drills and exercises; familiarisation with Germany's cultural background through the use of video material and various cultural themes presented in the course book.

GE4323 German for Business 3 (Autumn/2)

4 hours per week; 13 weeks/3^{rdt} semester; 26L/26T; ECTS credits:6

Transfer of acquired language skills to communicative situations students are likely to encounter in the

workplace; focus on development of written proficiency; practical activities to include preparation of CV's, practice at completing official forms, development of interview and telephone techniques and other work-related interactive sills; use of authentic material supplemented by role play exercises to simulate the work environment.

GE4411/GE4511 German for Engineering/Science 1 (Advanced) (Autumn/1)

4 hours per week; 13 weeks/ 1st semester; 26L/26T; ECTS credits:6

Basic grammatical structures and vocabulary necessary to cope in everyday situations; effective dictionary use; autonomous learning.

GE4421 German for Engineers 1A (Autumn/1)

4 hours per week; 13 weeks/1st semester; 26L/26T; ECTS credits:6

Emphasis will be given initially to improving students' reading, listening and spoken skills. Video and text material will be exploited to introduce students to aspects of living and studying in Germany and to revise both grammatical structures and vocabulary necessary to cope with everyday situations in such an environment.
In addition to the three contact hours, students will be required to spend at least one hour per week working on a self-access basis. Such work will form part of the assessment and may include revision and consolidation of classroom materials in the computer-assisted language laboratory, guided watching of videos and satellite television, and activities reflecting students' own individual interests in German language and culture. Students will be introduced to the principles of semi-autonomous learning which will enable them to identify their own learning needs and to develop effective learning strategies.

GE4423 German for Engineers 3A (Autumn/2)

4 hours per week; 13 weeks/3rd semester; 26L/26T; ECTS credits:6

The module concentrates on perfecting practical skills such as writing applications, formulating CVs, and participating in job interviews. Students are also encouraged to recognise and discuss their expectations about living in a different culture. Authentic materials will be exploited throughout to provide students with an insight into potential differences in areas such as attitudes and values, work patterns and work ethic, etc. In their self-access time, students will be encouraged to follow developments in current affairs, industry and technology. *Prerequisite GE4421*

GE4513 German for Engineering/Science 3 (Beginners) (Autumn/2)

4 hours per week; 13 weeks/3rdsemester; 26L/26T; ECTS credits:6

Further grammatical areas; internal structure of texts; aspects of living in a German speaking context; letters, short reports, CVs.

GE4621 German Literature and Culture 1 (Autumn/1)

4 hours per week; 13 weeks/1st semester; 13L/26T/13LAB; ECTS credits:6

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

GE4623 Romanticism, its Background and its Legacy (Autumn/2)

3 hours per week; 13 weeks/3rd semester; 26L/13T; ECTS credits:6

Lecture: critique of the Enlightenment; the Preromantics: Sturm und Drang; Romanticism in Europe; Romanticism in art and literature; political Romanticism, particularism and nationalism; Young Germany, Vormärz, 1848; the legacy of Romanticism in the 20th century.
Tutorials: Discussion and analysis of selected writers of the romantic era including Novalis, E. T. A. Hoffmann, Eichendorff, Heine and women writers like Bettina von Arnim, Rahel Varnhagen and Dorothea Schlegel. Study of Romantic paintings (C. D. Friedrich, P. O. Runge).

GE4627 German Literature and Culture 5: Aspects of 20th Century Writing in German (Autumn/4)

3 hours per week; 13 weeks/7th semester; 26L/13T; ECTS credits:6

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

GE4921 German for Business 1 (Advanced) (Autumn/1)

4 hours per week; 13 weeks/1st semester; 26L/26T; ECTS credits:6

Lecture: The German language, its history and relationship with other languages; political geography of the German-speaking countries; historical background to present day Germany, focus on 1871 to 1939. Intensive revision of grammatical structures; consolidation of existing language skills and development of a basic competency in the language; equal emphasis on development of accuracy in oral and written expression; examination of socio-economic and political structures and of Germany's cultural background.

GE4923 German for Business 3A 1-3-0 (Autumn/2)

4 hours per week; 13 weeks/3rd semester; 13L/39T; ECTS credits:6

Education environment educational systems, universities and university life, the legacy of 1968 work environment, vocational system, industrial relations, company structures, trade unions, xenophobic tendencies, Germany as a multicultural country Emphasis will be placed on enabling students to make presentations on business issues in German, introducing the concept and the importance of trade fares (Messe); German companies in Ireland / Irish companies in Germany; issues in intercultural communication (German/Irish). *Prerequisite GE4922*

GE4925 German for Business 5A (Autumn/3)

4 hours per week; 13 weeks/5th semester; 26L/26T; ECTS credits:6

Provision of an adequate ability to interact in the specific situations arising within the areas chosen by students in this semester as their specialisation: familiarisation with the language of marketing and economics; introducing the language of finance and accounting; preparation and oral presentation of a case-study or report, based on the students' own area of expertise; revision of practical skills to prepare students for Co-operative Education placements.
Prerequisite GE4924

GE4927 German for Business 6A (Autumn/4)

4 hours per week; 13 weeks/7th semester; 26L/26T; ECTS credits:6

Preparation and oral presentation of a case-study or report based on the students' own experience during Cooperative Education; the translation of general and business texts and documents from the foreign language; how to research Business subject matter. Analysis and familiarisation with current socio-economic issues in Germany.
Prerequisite GE4925

GY4013 Social & Urban Geography (Autumn/2)

3 hours per week; 13 weeks/3rd semester; 26L/13T; ECTS credits:6

Development and scope of social geography, paradigms, patterns and processes; change and development within rural communities; urban patterns, residential location, territoriality, intra-urban mobility, segregation; urbanisation as a social process, problems of growth and decay.

GY4016 Economic Geography (Autumn/3)

3 hours per week; 13 weeks/6th semester; 26L/13T; ECTS credits:6

The economy and economic geography; manufacturing activity and least cost location theory; Weberian location theory; transportation cost as a factor of location; production costs and location; scale and agglomeration; spatial behaviour of large organisations; deindustrialisation and tertiatisation; nature of service activity; market area analysis; central place theory; quaternary activities and office location; location and public policy.

GY4031 Introduction To Human Geography (Autumn/1)

3 hours per week; 13 weeks/1st semester; 26L/13T; ECTS credits:6

Why human geography is worth doing; what human geography writes for students to read; worldviews through the eyes of the human geographer;

HI4007 Historiography (Autumn/2)

3 hours per week;13 weeks/3rd semester;26L/13T;ECTS credits:6

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; post-colonialism; gender and ethnicity; the peripheries of historical knowledge; the archive; subaltern studies; memory and remembering to forget; public history and commemoration; the end of history?

HI4031 Early Modern Europe and Ireland (Autumn/2)

3 hours per week;13 weeks/3rd semester;26L/13T;ECTS credits: 6

Anglo-Irish and Gaelic lordships; Habsburg world ascendancy; the revolt of the Netherlands, 1566-1648; the Nine Years' War and the Flight of the Earls, 1593-1607; religious conflict in France, 1559-94; Spain in the seventeenth century; the Thirty Years War, 1618-48; France in the age of Cardinal Richelieu and Louis XIV; civil war and interregnum in the British kingdoms; Austria, Britain and the Dutch Republic as rivals to Louis XIV.

HI4032 Capitalism and Industrial Society, 1450-1900

3 hours per week;13 weeks/3rd semester;26L/13T;ECTS credits: 6

Agriculture, power and printing; a European *mentalité*? feudalism, craft and capitalist production; navigation, a world economy, mercantilism; demography and the agricultural revolution; invention and innovation in metal, mining, textiles, power, transport; social change; Marx and technological determinism, location and timing of industrialisation; the invention of invention; the built environment; communications and transport; public health and modern medical innovation; the mechanization of food supply. *Note numbers will be restricfed on this module for 2008/9*

HI4041 Diplomacy, Government and the State 1560 – 1660 (Autumn/2)

3 hours per week;13 weeks/3rd semester;26L/13T;ECTS credits: 6

The political geography of early modern Europe – Ireland in its broader context; diet, demography and disease; nobles, clergy, merchants and peasants; family life; agriculture and commerce; the military revolution; republics, absolutist states and composite monarchies; the structure of state building; the general crisis of the mid-seventeenth century; the development of capital cities; court society and the world of the favourite; Irish plantation and European expansion; witchcraft, medicine and the scientific revolution.

HI4042 Women and History (Autumn/1)

3 hours per week; 13 weeks/2nd semester; 26L/13T; ECTS credits:6

Why women's history? The rights and status of women in 1789;women as revolutionaries - France 1789; Ireland 1916, Russia 1917; the life and achievements of Mary Wollstonecraft; women and politics-informal and formal; women and work-Britain, France and Ireland in the nineteenth century; women and religion belief and institutions; women and education-access, experience, consequences; women and world war one.

HI4043 Europe: Enlightenment & Revolution 1688 – 1815 (Autumn/2)

3 hours per week;13 weeks/3rd semester;26L/13T;ECTS credits: 6

Changing mentalities in eighteenth-century Europe; the emergence of Russia and Prussia; the expansion of Britain as a world power; the Enlightened absolutist rulers; Spain in the eighteenth century; the collapse of the Old Regime in the 1780s; European revolution in the 1780s and 1790s; Napoleonic Europe; reaction, conservatism and romanticism, 1815–1830; Austria in the age of Metternich; the revolutions of 1848.

HI4053 Ireland: 1750 – 1850 (Autumn/2)

3 hours per week;13 weeks/3rd semester;26L/13T;ECTS credits:6

Diverse societies, economies and cultures: disunited kingdom and discontented colony; owning, managing and working the land: the rural economies; subsistence, markets, production and surplus; the long-term demographic trend and the demographic transition; family and household; gender, sexuality and patriarchy: proto-industrialisation, urban growth, and the modernisation of industry; breaking and making the union; professional society and the urban proletariat; the transformations of language use: Anglicisation 1750-1914; the failure of economic capacity: coping with poverty; rural prosperity and rural crisis; the triumph of capitalism.

HI4147 Ireland and the United States of America, 1790 to 1960: A Special Relationship

3 hours per week;13 weeks/3rd semester;26L/13T;ECTS credits: 6

Irish emigration; formal and informal links – economic, social, political; the 1845-51
famine; the US civil war; the second emigrant wave; the Irish in the US political
system; world war one; revolutionary Ireland, 1916-22; political, economic and social
ties in the inter-war period; world war two; the Marshall Plan, 1947-57; the
diplomatic relationship, 1951-60.

HI4137 The History of Political Thought of Human Rights

3 hours per week;13 weeks/3rd semester;26L/13T;ECTS credits: 6

The syllabus will be structured around different theoretical frameworks and specific case studies of social movements, individual reform campaigns and ideas; persistence of human rights as a motive force of history; philosophies underpinning the enlightenment/romanticist paradigm; slavery; abolition campaigns and early humanitarian organization; Anti-Slavery Society; the Congo Reform Association; transnational political organizations such as the League of Nations and United Nations; crimes against humanity and colonialism; the Armenian massacres; the Bryce report; the Nuremberg and Tokyo tribunals; pacifism; women's rights; black power; silencing the past.

HI4127 Understanding the Holocaust in Twentieth-Century Europe

3 hours per week;13 weeks/3rd semester;26L/13T;ECTS credits: 6

Jews in inter-war Germany and Europe; war and the racial reordering; everyday life under the Occupation and in the ghettos; deportations; hierarchies of power in the
camps; perpetrators; surviving the Holocaust – co-optation and resistance; opening the camps – reconstructing Holocaust experiences; the Holocaust and historians; the

victims' experience and its legacy for contemporary society; interface between the Nazi espousal of eliminationist biology and the motivation of perpetrators; politics and law; victims' varied reactions in the context of national and local communities;
national, communal and individual bystanders; recovering Holocaust experiences.

HI4042 Women in History, 1789-1918

6hours per week;13 weeks/3rd semester;39L/39T;ECTS credits:6

The study of women's history in the modern period. Women between 1789 and 1918,
including radicalism, philanthropy, industrialisation, work, poverty, migration,
prostitution, education, politics and nationalism.

HU4011 Business and Society 1 (Autumn/1)

3 hours per week; 13 weeks/1st semester; 26L/13T; ECTS credits:6

Principal economic, social, cultural and political factors as a background to contemporary Irish life; Ireland as an economically and socially dependent periphery of Great Britain; state formation and national identity; demographic trends and migration patterns; the transformation of rural Ireland; censorship and social control; family and sexuality; community versus class; changing occupational and class structure; the constitutional framework of politics; political parties and Irish society; elections and representative government; policy making - Dáil, civil service, interest groups; problems and issues in contemporary Ireland; unemployment, industrial relations, women's rights, the welfare state; the Northern Ireland conflict; social change and intellectual revolution; Ireland and Europe.

JA4211 Japanese Language, Culture and Society 1 (Autumn/1)

6hours per week;13 weeks/1st semester;39L/39T;ECTS credits:6

Listening practice leading to recognition of numbers, times, days, dates, locations; conversation practice based on grammar structures and vocabulary necessary to introduce oneself politely, ask basic questions, explain schedules, and talk about pastimes; reading and writing practice introducing the hiragana and katakana writing systems and 80 kanji, progressing from the understanding of notices and posters to descriptions of people's everyday lives; writing passages involving self-introduction, daily routines, hobbies, and shopping; also discussion in English about Japanese customs, culture and society.

JA4213 Japanese Language, Culture and Society 3 (Autumn /2)

6hours per week;13 weeks/3rd semester;39L/39T;ECTS credits:6

Understanding of instructions, needs and wants, descriptions of events in order. Speaking exercises explaining actions in sequence, telling stories, making requests and asking permission. Reading more demanding passages about Japanese life and society. Written exercises concentrating on descriptions and narratives; also memos, letters and notes. Study of a further 170 kanji to bring the total up to 250 characters. Discussion of modern Japanese culture, literature and films.
Prerequisite JA4212

JA4217 Japanese Language, Culture and Society 5 (Autumn/4)

6hours per week;13 weeks/3rd semester;39L/39T;ECTS credits:6

Authentic listening practice, especially broadcast news; test items from JLPT level 2 tests; speaking practice involving further use of polite language; presentations about work experience and current affairs; spoken summaries of reading and broadcast material; reading of authentic passages including news stories and literature; translation of a variety of passages into English; writing of summaries, descriptions, and letters of various levels of formality; study of a further 150 kanji.
Prerequisite JA4216

JA4511 Japanese for Engineering/Science 1 (Autumn/1)

6 hours per week; 13 weeks/1st semester; 26L/39T/13Lab; ECTS credits:6

Basic daily conversation through role-playing exercises and pronunciation practice in the language laboratory; the Japanese syllabary alphabets (Hiragana and Katakana); elementary grammatical structures; simple question and answer exercises; elementary descriptive writing, introducing oneself; introduction to the first 30 kanji.

JA4513 Japanese for Engineering/Science 3 (Autumn/2)

6 hours per week; 13 weeks/3rd semester; 26L/39T/13Lab; ECTS credits:6

Further basic grammatical structures including verbal plain forms; vocabulary expansion through functional exrcises; introduction of a further 75 kanji; basic personal correspondence and communication. *Prerequisite JA4512*

JA4911   Japanese for Business 1 A (Autumn/1)

6 hours per week; 13 weeks/1st semester; 26L/39T/13LAB; ECTS credits:6

Elementary daily conversation through role play exercises and pronunciation practice in the language laboratory; simple question and answer exercises; the Japanese syllabary alphabets (Hiragana and Katakana); elementary descriptive writing, such as introducing oneself; introduction of the first 50 kanji; elementary grammatical structures.

JA4913 Japanese for Business 3 (Autumn/2)

6 hours per week; 13 weeks/3rd semester; 26L/39T/13LAB; ECTS credits:6

Vocabulary expansion and consolidation through the audio-visual materials; introduction of a further 80 kanji; kanji consolidation through selected Japanese texts; basic personal correspondence, i.e. letter of greeting; basic conversation skills through sketch presentation, e.g. visiting, receiving visitors, etc.; further basic grammatical structures

JA4915 Japanese for Business 5 (Autumn/3)

6 hours per week; 13 weeks/5th semester; 26L/39T/13LAB; ECTS credits:6

Business presentation in Japanese, i.e., describing a company and explaining its products; basic business

communication, e.g., discussing trade terms and patents and reporting in business talks on what has been discussed; consolidation of basic grammatical structures; introduction to a further 70 Kanji (Total 360).

JA4917 Japanese for Business 7 (Autumn/4)

6 hours per week; 13 weeks/7th semester; 26L/39T/13LAB; ECTS credits:6

Business project in Japanese: advertisements in both written and oral forms; further business communication: discussing price and quantity; introduction and intermediate grammatical structures; introduction of a further 70 kanji (total 430)

JM4001 Professional Skills for Journalism 1 (Autumn/1)

3 hours per week; 13 weeks/1st semester;13L/26L; ECTS credits:6

In Professional Skills for Journalists students will learn to find stories through observation exercises, vox pops, and internet and other research. They will learn the principles of professional editing for print, including headline and standfirst writing, and cutting to length, and how to design for print and websites. They will be introduced to the principles of broadcast news writing, and the principles of illustrating news, including taking photographs and generating graphics.

JM4021 Journalistic Writing 1

3 hours per week; 13 weeks/1st semester;13T/26L; ECTS credits:6

In Journalistic Writing 1, students will learn news writing, through practice and by analyzing professional work. They will create their own news stories from their own notes and documents, and will practise writing intros and structuring a news story both for print and the internet. They will be helped to begin writing for student publications and their own blogs and will be encouraged to contribute to web forums on journalistic matters.

JM4441 Shorthand 1

4 hours per week; 13 weeks/1st semester;52L; ECTS credits:6

Shorthand is the preferred recording method for professional journalists. Through regular practice, students will begin to: develop the listening skills and basic elements of a recognised form of shorthand, learn to read and transcribe their notes fluently and accurately, and identify any particular challenges they have in relation to language skills, rectifying these through independent work. Students will also be expected to look for opportunities outside the contact hours to practise their shorthand skills on a regular basis.

LA4001 Legal System and Method (Autumn/1)

3 hours per week; 13 weeks/1st semester; 26L/13T; ECTS credits:6

The concept of law, common law, civil law in Europe; sources of law; the administration of Justice in Ireland; Classification of law; municipal, international, substantive, procedural, public, private; elements of the Constitution of Ireland; legal reasoning and methodology.

LA4022 Commercial Law (Autumn/1)

3 hours per week; 13 weeks1st Semester; 26L/13T; ECTS credits:6

Review of US anti trust legislation, enforcement mechanisms, the relationship between intellectual property rights and competition abuses; remedies at law and equity; alternative mechanisms for dispute resolution, arbitration, private courts, negotiation; bankruptcy, personal versus corporate, historical evolution, philosophical basis, bankruptcy Act 1988, comparative views for the US.

LA4035 Labour Law (Autumn/3)

3 hours per week; 13 weeks/5th semester; 26L/13T; credits 6

Nature of labour law; protective legislation and conditions of employment; termination of employment; trade unions; courts and tribunals in labour law.

LA4111 Contract Law 1 (Autumn/1)

3 hours per week; 13 weeks/1st semester; 26L/13T; ECTS credits:6

Formation of contracts: offer and acceptance; intention; doctrine of consideration; formal and evidentiary requirements: void, voidable and unenforceable contracts; construction/interpretation of contracts: intention; parole evidence; express and implied terms; public interest restrictions on contractual freedom: camacity; illegality; privity; competition policy; doctrine of restraint of trade; consumer protection.

LA4211 Criminal Law 1 (Autumn/1)

3 hours per week; 13 weeks/1st semester; 26L/13T; ECTS credits:6

Historical and ethical consideration of criminal law; characteristics of a crime; parties to a crime: principals and accessories; vicarious liability; elements of a crime; actus reus; conduct; omissions; status; mens rea: intention; recklessness; criminal negligence; men in penal statutes; offences of strict liability; general defences: infancy; insanity; automatism; intoxication; mistake; necessity; duress; self defence; inchoate offences: attempt; incitement; conspiracy.

LA 4310/LA4330 Law of Torts 1 (Autumn/)

3 hours per week;13 weeks/1st Semester; 26L/13T; ECTS credits:6

Nature and function of Torts; negligence; breach of statutory duty; general defences in tort; parties.

LA4410 Public Law 1 (Autumn/2)

3 hours per week;13 weeks/1st Semester; 26L/13T; ECTS credits:6

The historical background to the 1937 Constitution; the legal nature of the Constitution; the legal personality of the State; sovereignty; the juridical nature of the claim to territory in Articles 2 and 3. Separation of powers; office of the President; the Oireachtas; the Dail; the Seanad; the executive. The law of local government. International relations and membership of the EC; judicial power; constitutional litigation; constitutional interpretation.

LA4510 Law of Business Association Autumn/4)

3 hours per week;13 weeks/7th Semester; 26L/13T; ECTS credits:6

Introduction to Business Associations: companies sole traders and partnerships; the historical development of company law: effects of incorporation; separate legal personality; torts and contracts; lifting the veil; limitation of liability; distribution of assets on winding up; majority rule, minority protection; formation of a company; Memorandum and Articles of Association; flotation; application for allotment of shares; commencement of business.

LA4610 Land Law 1 (Autumn/3)

3 hours per week;13 weeks/3rd Semester; 26L/13T; ECTS credits:6

The nature of land law and its historical evolution, the concept of estates and tenure; freehold estates; fee farm grants; fee simples; fee tails; life estates; pyramid titles; future interests; incorporeal hereditaments; co-ownership; lesser interests in real property including licences and covenants; registration of interests in real property; extinguishment of interests; adverse possession; merger.

LA4620 Land Law 2 (Autumn/4)

3 hours per week;13 weeks/7th semester; 26L/13T; ECTS credits:6

The concept of public control on the use, transfer and development of real property, methods of real property transfer of ownership, public restrictions on the use of real property; landlord and tenant law, nature and creation of the relationship, determination of the relationship, statutory control of tenancies, public welfare codes; the laws relating to succession, statutory control of the right to devolve property upon death, wills and intestacies.

LA4713/LA4723 Law of European institutions (Autumn/2)

3 hours per week; 13 weeks/3rd semester; 26L/13T; ECTS credits:6

The Treaties of the European Communities and European Union as amended; Legal personality - in national and international law: Institutions/bodies; Sources of Community law; Nature of Community law; new legal order; supremacy of Community law; direct effect; direct applicability; Ireland and the EC and EU; constitutional referenda; method of incorporation; the European Communities Acts, 1972-1995; Oireachtas scrutiny of secondary legislation; Relationship between Community and national law; methods of incorporation in different Member States.
Prerequisite LA4001

LA4810 Equity and Trusts 1 (Autumn)

3 hours per week;13 weeks; 26L/13T; ECTS credits:6

The nature of Equity, priorities, registration and notice, mortgages; equitable doctrines, conversion, election, satisfaction and ademption, performance, donations mortis causa; equitable remedies, the injunction, specific performance, recession, rectification, declaration and tracing.

LA4901   Principles of Law (Autumn/1)

3 hours per week; 13 weeks/1st semester; 26L/13T; ECTS credits:6

The concept of law, common law and equity, historical development, precedent and legal reasoning, the civil law system in Europe, Community Law; sources of Law, the 1937 Constitution, the European Treaties, statutes, case law, custom; the Administration of Justice in Ireland, court structure and jurisdiction, legal and equitable remedies; role of law in the business environment, its function and methods, legal philosophy in business law, substantive issues of law: constitutional law; property law; law of torts; criminal law; business ethics and the law.

LI4113 Language Technology (Autumn/2)

3 hours per week; 13 weeks/3rd semester; 26L/13T; ECTS credits:6

Overview of computer applications in modern languages, including machine translation and computer aids for the translator; corpus linguistics; terminology management and on-line dictionaries; CALL applications; practical seminars in the CALL lab; develop skills in word-processing in the target language, text structuring and text editing.

LI4211   Linguistics 1 (Autumn/1)

3 hours per week; 13 weeks/1st semester; 26L/13T; ECTS credits:6

Definition, properties, functions of language; history and development of linguistics; basic linguistic concepts; grammatical; categories; levels of linguistic analysis - phonology, morphology syntax, semantics; language history and change, language families, the Indo-European heritage; language varieties dialect register, standard issues in pragmatics, text and information structure; conversation and discourse analysis; speech acts, direct and indirect.

PA4012   Paragovernmental Organisations (Autumn/1)

3 hours per week; 13 weeks/1st Semester; 39L; ECTS credits:6

Para-overnmental organisations (state-sponsored bodies) in the Irish public service; commercial and non-commercial agencies; legal, structural and financial characteristics of state-sponsored bodies; the structure of accountability; ministers, management and the houses of the Oireachtas; the rationale for and impact of state enterprise in Ireland; efficiency and performance appraisal in state enterprise; privatisation; paragovernmental organisations in comparative perspective.

PA4017 Sub National Government in Europe: Challenge and Change (Autumn/4)

3 hours per week; 13 weeks/7th Semester; 26L/13T; ECTS credits:6

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

PA4021 Ideas and Concepts in Public Administration (Autumn/1)

3 hours per week; 13 weeks/1st semester; 26L/13T; ECTS credits:6

Introduction to the development of modern thought on public administration starting from Woodrow Wilson and

the Northcote Trevelyan report. Discussion of different schools of thought on public administration: Max Weber's theories on bureaucracy, Power block Theory, Scientific Management, Rationalism, Incrementalism, Public Choice and New Public Management, Post-modern discourse on public administration.

PL4017   Regional Development (Autumn/4)

3 hours per week; 13 weeks/7th semester; 26L/13T; ECTS credits:6

The field of locational analysis; market forces; spatial concepts; raw materials; transport; labour; capital; technology; agglomeration; development theories; stages; growth poles; dualism; development from below; empowerment.

PO4011   Introduction to Government and Politics (Autumn/1)

3 hours per week; 13 weeks/1st semester; 26L/13T; ECTS credits:6

Introduction to basic institutions of government, including the constitution, the legislature, the executive, the judicial system, the civil service, pressure groups and political parties; examination of patterns of government in contemporary democratic and non-democratic systems and of the political ideologies that sustain them; evaluation of the main approaches to political analysis.

PO4018   International Relation (Autumn/)

3 hours per week; 13 weeks/7th Semester; 26L/13T; ECTS credits:6

International relations at the macro-level; cyclical and linear theories; utopianism versus realism; systems theory; international organisation, interdependence and regime theory economic theories; Marxism, imperialism and neo-colonialism; and world society models; foreign policy analysis; decision-making models; the role of personality, beliefs and perceptions; culture; political regimes; and state-society relations.

PO4077 Nations and Nationalism in the Modern World

3 hours per week; 13 weeks/7th semester 26L/13T;ECTS credits: 6

This course addresses the question of why national identities and nationalist movements remain so influential in shaping popular politics. In the first part of the course we will begin by considering a range of explanations for the emergence and development of nationalism. Subsequently we will explore the variety of national identities and movement that are generated in different social and historical contexts. We will do this through looking at four case studies.

PO4023   Comparative European Politics (Autumn/2)

3 hours per week; 13 weeks/3rd Semester; 26L/13T; ECTS credits:6

Introduction to comparative European politics; provides a basic understanding of the organisation of European governmental systems; the role of political parties; party families; voting behaviour; majoritarian and consensual Democracies; the politics of individual European states.

PO4027   International Organisations & Global Governance (Autumn/4)

3 hours per week; 13 weeks/7th Semester; 26L/13T; ECTS credits:6

The origins of international organisations and their place in liberal internationalist thought; the successes and failures of the league of nations system; the united nations system and its internal processes; regional organisations; non-governmental organisations and global governance; international organisations and the search for political and military security; functional-technical co-operation a the regional and global level; global governance and the post-cold war global political economy.

PO4028 Ethnic Conflict in Ireland and Europe (Autumn/4)

3 hours per week; 13 weeks/8th Semester; 26L/13T; ECTS credits:6

The rise of ethnic conflict in Europe; language and religion as sources of division; mechanisms for the regulation or reduction of conflict; selected cases of ethnic conflict in Europe; domestic and external factors influencing the pattern of inter-group relations; the pursuit of solutions to ethnic conflict; the sources of the conflict in Northern Ireland; religion as an ethnic label; the transition from the pursuit of civil rights to the pursuit of national rights; the search for an internal solution based on power sharing; the Irish and British dimensions.

PO4032 Russian Politics (Autumn/1)

3 hours per week; 13 weeks/2nd Semester; 26L/13T; ECTS credits:6

The politics of the Soviet Union and Russia, including some of the most salient features of the Soviet political system; the origins and development of the Soviet system; the Communist Party of the Soviet Union and the Soviet State; the centrally planned economy; the pre-crisis situation at the beginning of the 1980's; the crisis that it faced in the early 1980's; the development of the Gorbachev reforms; the rise of Russia and the Republics; the politics of collapse; constitutional dilemmas and economic collapse in the post-Soviet policy agenda; the post Soviet struggle for power; the choices made by Russia's rulers in 1991-1992; political development in Russia; the progress made towards a market economy and democracy; the new economy; vested interests versus the public good; interest representation, elections and public opinion; sub-national politics, Russia and the World; the Putin Presidency.

PO4007 Nations and Nationalism in the Modern World (Autumn/7)

3 hours per week; 13 weeks/7th semester; 26L/13T; ECTS credits:6

This course addresses the question of why national identities and nationalist movements remain so influential in shaping popular politics. In the first part of the course we will begin by considering a range of explanations for the emergence and development of nationalism. Subsequently we will explore the variety of national identities and movement that are generated in different social and historical contexts. We will do this through looking at four case studies.
The intention of this course is to familiarise students with debates about the causes and nature of nationalist politics. One key aim of this course is to enable you to take general theories – in this case those that explain nationalism – and

to use them critically, testing their validity, and if necessary, introducing your own modifications and qualifications to these theoretical generalizations. Two sorts of nationalist movement predominate. Historically, over especially the last two centuries, nationalist movements mobilized people politically around an idea of the nation-state as a natural or organic cultural community. More recent nation-building projects in multi-cultural or multi-ethnic societies often try to construct for their followers a narrative of shared history.

SO4001 Introduction to Sociology (Autumn/1)

3 hours per week; 13 weeks/1st semester; 26L/13T; ECTS credits:6

The Scope of Sociology; locating yourself sociologically: culture and identity - sociological versus personal explanations; four sociological perspectives: conflict, functionalist, interactionist and feminist perspectives introduced; what do sociologists do? an exploration of the key research methods used by sociologists in their analysis of society; doing sociology: an examination of power and control in society; a consideration of social structure in terms of gender, race and class; sociological consideration of social structure in terms of gender race an class; sociological understandings of social change, social exclusion, work and non-work, religion and the media; sociological accounts of the state; crime, health and education.

SO4018   Dependency, Development and Change+ (Autumn/)

3 hours per week; 13 weeks/8th Semester; 26L/13T; ECTS credits:6

Theories of modernisation and change, the concept of dependency and underdevelopment, social change and the marginalisation of populations, an examination of the Irish Experience in the light of these theories; State policy and social change, local development initiatives.

SO4028 Qualitative Research Methods (Autumn/4)

3 hours per week; 13 weeks/8th Semester; 26L/13T; ECTS credits:6

Ethnography, fieldwork, participant observation, non-participant observation, evaluation studies, content analysis of both documents and interviews, reliability and validity in qualitative research; the location of these methods within grounded theory; writing up qualitative research.

S0 4033 Sociology of Media (Autumn/2)

3 hours per week; 13 weeks/3rd semester; 26L/13T;ECTS credits:6

Sociology and the analysis of media and communications; The Conflict Perspective: Ideological analyses of the media; The Interactionist Perspective: Analyses of message production; Users and Gratification's and Reception Analysis approaches to the Media Audience; The Politics of the Popular: TV Drama and the coverage of social issues with specific reference to Feminist Perspectives on the media. Media Representation of the Economy: The work of the Glasgow Media Group; Media Representation of Poverty and Inequality; Media Globalisation: More Choice or Just More Channels

SO4048   Women, Welfare and the State (Autumn/4)

3 hours per week; 13 weeks/8th Semester; 26L/13T; ECTS credits:6

Social policy; the role of the state; women as supporters or supported; the assumptions implicit in a social welfare system; the nature, extent and source of women's poverty; the concept of the feminisation of poverty; policies facilitating/inhibiting women's economic dependency; community care; women as unpaid carers; policies involving the elderly; policies concerning child care- in two parent and lone parent settings and their implications for women; 'women oriented' family support programmes; caring for carers.

SO4053   Investigating Social Reality (Autumn/2)

3 hours per week; 13 weeks/3rd semester; 26L/13T; ECTS credits:6

Competing assumptions underlying research methodologies, the research process, initiating social research, ethical considerations underlying the research process, designing a research brief, exploring the potential, relevance and effectiveness of a variety of techniques such as interview techniques, non-participant observation and the use of secondary sources.

SP4001 Who are the Spaniards: Introduction to Spanish Culture (Autumn/1)

3 hours per week; 13 weeks/1st semester; 13L/26T; ECTS credits:6

This module offers an introduction to the most important events and movements in Spanish culture. It focuses mainly on the cultural impact of the Spanish Empire, the Spanish Civil War, the dictatorship of Francisco Franco, and the Transition to Democracy. Through the use of literature, music, film and other forms of culture, the module will serve as a platform for the exploration of up-to-date socio-political issues in Spain and their effect on cultural production.

SP4131 Spanish for Beginners 1 (Autumn/1)

3 hours per week; 13 weeks/1st semester; 26L/13T; ECTS credits:6

Students acquire basic reading and writing skills by being exposed to authentic and simplified language material both written and oral; emphasis will be given to oral skills both listening and speaking; special attention will be given to those sounds with which the student is not familiar; introduction to Spanish as a romance language Spanish in Spain and beyond Europe Spanish syntax semantics and phonology.

SP4133 Spanish for Beginners 3 (Autumn/2)

6 hours per week; 13 weeks/3rd semester; 39L/39T; ECTS credits:6

Introduction to new grammatical structures and expansion of vocabulary dealing with a wide variety of real life situations: students will learn the grammar and lexicon needed to give an account of a personal experience give personal opinions and express judgement and feelings in Spanish and practice translating these structures: the lecture hour will deal with life in Spain and Latin America the education system the work environment and general traditions:

SP4141 Spanish Language and Society 1: Introduction to Spanish Studies (Autumn/1)

3 hours per week; 13 weeks/1st semester; 26L/13T; ECTS credits:6

An overall revision of Spanish grammatical structures and their usage; text analysis and exposure to a variety of writing styles; oral discussion and presentations of topics relevant to the theme of the general lectures; Spanish language; its history and linguistics; the Spanish-speaking countries; political geography, Spanish variations and dialects.

SP4143 Spanish Language and Society 3: Education, Work and Business in Spain and Latin America (Autumn/2)

3 hours per week; 13 weeks/3rd semester; 26L/13T; ECTS credits:6

Spain and Latin America's relevant issues in the world of education work and business; a look at legends traditions beliefs and fiestas from an anthropological perspective and as preparation for study/work abroad period.

SP4147 Spanish Language and Society 5: Spain Europe and Beyond (Autumn/4)

3 hours per week; 13 weeks/7^{tht} semester; 26L/13T; ECTS credits:6

Vocabulary and grammar problem areas for English speakers; contrastive language analysis by use of translation of various types of text; cultural, linguistic and political relationship between Spain and hispanoamerica; Spain's political role within the EU: EU legislation and developments and their effects on Spanish soil; Spanish-Irish relations; Latin American-Irish relations.

SP4231 Spanish Language, Culture & Society 1 (Beginners) (Autumn/1)

6 hours per week; 13 weeks/1^{stt} semester; 13L/56T/13Lab; ECTS credits:6

An overall revision of Spanish grammatical structures and their usage. Text analysis and exposure to a variety of writing styles. Oral discussion and presentations of topics relevant to the theme of the general lectures. Spanish language: its history and linguistics; the Spanish-speaking countries: political geography, Spanish variations and dialects.

SP4233 Spanish Language, Culture & Society 3 (Beginners) (Autumn/2)

6 hours per week; 13 weeks/1^{stt} semester; 13L/56T/13Lab; ECTS credits:6

Spain and Latin America's relevant issues in the world of education, work and business. A look at legends, traditions, beliefs and 'fiestas' from an anthropological perspective and as preparation for study/work abroad period.

SP4241   Spanish language, culture and society 1 (Autumn/1)

3 hours per week; 13 weeks/1st semester; 26L/13T;ECTS credits:6

An overall revision of Spanish grammatical structures and their usage. text analysis and exposure to a variety of writing styles. Oral discussion and presentations of topics relevant to the theme of the general lectures. Spanish language: its history and linguistics; the Spanish-speaking

counties: political geography, Spanish variations and dialects.

SP4243 Spanish Language, Culture & Society 3 (Advanced) (Autumn/2)

4 hours per week; 13 weeks/3^{rdt} semester; 13L/26T/13Lab; ECTS credits:6

Spain and Latin America's relevant issues in the world of education, work and business; a look at legends, traditions, beliefs and 'fiestas' from an anthropological perspective and as preparation for study/work abroad period.

SP4247 Spanish Language, Culture & Society 5 (Advanced) (Autumn/4)

4 hours per week; 13 weeks/7^{tht} semester; 13L/26T/13Lab; ECTS credits:6

Students are introduced to a variety of EU-related topics which are then covered in more detail during the discussion hour, Spain's political role within the EU, EU legislation and developments on Spanish soil, Spanish-Irish relations and Latin-American-Irish relations are examples of these topics, students also pursue more advanced translation and writing.

SP4621 A Culture of Transition: Spanish Film and Literature (Autumn/1)

4 hours per week; 13 weeks/1st semester; 26L/26T; ECTS credits:6

One weekly lecture will focus on the general background to the transition (recent history of Spain since the Civil War) and two tutorials will take a detailed study of literary and filmic texts.

SP4623 The Spanish Golden Age (Autumn/2)

3 hours per week; 13 weeks/3rd semester; 13L/26T; ECTS credits:6

One weekly lecture which will focus on the historical and socio-political background to the era being studied, and which will introduce the artists and writers whose works will be studied in this course; Velazquez; El Greco; Garcilaso de la Vega; Cervantes; Lope do Vega; Tirso de Molina; two tutorials in which literary and artistic works will be studied in detail.

SP4627 Twentieth Century Trends in Hispanic Literature (Autumn/4)

3 hours per week; 13 weeks/3rd semester; 13L/26T; ECTS credits:6

This module aims to analyse the major cultural developments in Hispanic literature of the twentieth century and to focu in particular on four major trends; Latin American modernismo and it's legacy in Spain; surrealism in art and literature; magical realism; and the 1980's boom in women's writing with particular regard to the relationship between feminism and popular culture.

TW4115 Technical Writing 1 (Autumn/3)

4 hours per week; 13 weeks/5th semester; 26L/26T; ECTS credits:6

Cognitive processes; reader analysis, readability factors; language/text structures; usability factors; peer review;

user testing; practice on a range of writing techniques and strategies.

WS4003 Contemporary Womens Wrting

WS4011 Feminist Perspectives: An Introduction (Autumn/1)

3 hours per week; 13 weeks/1st semester; 26L/13T; cedits:6

The nature of women's studies; an introduction to the main theoretical frameworks (viz Liberal; Radical; Psychoanalysis; Marxist and socialist; Existentialist and post-modern); exploration of topics (paid work; motherhood; violence etc.) in the context of these frameworks; a critical evaluation of multifactorial frameworks and their relevance in understanding the position of women in Irish society.

WS4018 Gender, Identity, Culture, Society (Autumn/1)

3 hours per week; 13 weeks/1st semester; 26L/13T; cedits:6

The aim of this inter-disciplinary course is to examine the historical, literary and social construction of identity and citizenship as this relates to women in contemporary society. It will examine the extent to which the sense of self, of home, of community, of nationality are gendered notions and their consequences for women. In addition, a comparative approach will be used to allow for an exploration of these themes within a multi-cultural context

CU4112 Language and Culture (Spring/1)

2 hours per week; 13 weeks/2ⁿᵈ semester;26L; ECTS credits:6

To examine some of the key elements of the interaction between language, culture and society.Language as a structured system: semantics and society: language, thought and worldview: language and identity: issues of language, power and conflict.

CU4116 Cultural Studies 4: Cultural Theory (Spring/3)

3 hours per week; 13 weeks/6ᵗʰ semester; 26L/13T; ECTS credits:6

To give students the opportunity to study in depth, the writings of key cultural theorists of the 20ᵗʰ century. Up to three authors will be covered taken from a list which could include Adorno, Barthes, Baudrillard, Benjamin, Bourdieu, Cixous, Derrida, Eco, Foucault, Habermas, Lacan, Marcuse, McLuhan, Warner, and Williams. The lectures will cover the selected authors and also contextualise them into the intellectual movements that they generated e.g. neo-modernism, structuralism and post-moderism.

CU4118 European Cinema (Spring/4)

3 hours per week; 13 weeks/8ᵗʰ semester; 26L/13T; ECTS credits:6

Students will study films from different countries for the ways in which they inform the European tradition. Lectures will cover different periods of European Cinema; Weimer cinema, Italian neo-realism, French New Wave and New German cinema. The tutorials will study individual films from the weekly screenings and apply theoretical approaches such as genre, auteur and image analysis.

EF4022   English as a Foreign Language (Spring/1)

4 hours per week; 13 weeks/2ⁿᵈ semester; 39T/13LAB; ECTS credits:6

The module is intended to bring the students to a higher advanced level of proficiency in the four language skills, to advance their knowledge of English grammar, to introduce elements of socio-political and economic issues into the material for language study and to use the acculturation process as the basis for language work. It includes advanced grammar work, development of listening, reading, writing and speaking skills, debates and discussion of topical issues, exploitation of English language media and essay and report writing.

EH4002   Critcal Practice II : Renaissance Literature (Spring/1)

4 hours per week; 13 weeks/2ⁿᵈ Semester; 26L/26T; ECTS credits:6

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

EH4012 Restoration and Augustan Literature (Spring/1)

3 hours per week; 13 weeks/4ᵗʰ semester; 26L/13T; ECTS credits:6

English literature 1660-1750; political and cultural contexts of the novel , essay and pamphlet literature; classical models in the Augustan age; the form of the couplet, verse-essay and pastoral; the concepts of stability, decorum, morality and manners.

EH4105 Nineteenth Century Studies (Spring/3)

4 hours per week; 13 weeks/4thSemester; 26L/26T; ECTS credits:6

This course begins by taking an overview of the Victorian era, and the degree to which it was influenced by Romanticism; It examines the major prose writings and poetries and looks at their influence on twentieth-century literature.

EH4108 Twentieth Century English Literature (Spring/3)

4 hours per week; 13 weeks/8ᵗʰ semester; 26l/26T; ECTS credits:6

The aim of this module is to introduce students to twentieth century English literature.The novel, poetry and prose will be considered in the context of the modernist movement in the twentieth century European culture.

EH4116 Contemporary Irish Writing in English (Spring/4)

3 hours per week; 13 weeks/6ᵗʰ semester; 26L/13T; ECTS credits:6

This course relates contemporary Irish writing to the literary scene of the early part of the century and looks at the major literary, political and social forces that have helped to shape it since then. Selections from contemporary poetry, drama and fiction are examined.

EH4125 Feminist Literary Theory and Criticism (Spring/4)

3 hours per week; 13 weeks 5ᵗʰ Semester 26L/13T; ECTS credits:6

Modern feminist literary theory; literary, psychoanalytic, philosophical and political perspectives; the way in which interconnections between these disciplines have been given primacy in feminist literary theory.

EH4126 Imagined Spaces: Irish Cultural Texts (Spring/2)

3 hours per week;13 weeks/ 3ʳᵈ semester;26L/13T;ECTS credits: 6

This module will provide a critical and a theoretical examination of Irish culture (both literary and media),

ranging from early twentieth century efforts to create an 'Irish national culture' to contemporary ways of imagining contemporary Irish identities within culture. The module provides a thorough grounding in theory and method that will enable the student to analyse a complex range of cultural texts as well as incorporating practice-based elements such as script writing.

EH4135 W.B. Yeats, Heaney and the Politics of Irish Identity (Spring/4)

3 hours per week; 13 weeks/5thSemester; 26L/13T; ECTS credits:6

Beginning with the poetry of WB Yeats, which will be considered as foundational, the course will move chronologically forward to include the poetic works of major authors such Denis Devlin, Austin Clarke, Patrick Kavanagh, Thomas Kinsella, Seamus Heaney, Michael Hartnett, Eavan Boland and Medbh McGuckian. Likewise, it is intended to introduce students to less 'renowned' poets. To this end, emerging poets such as Nick Laird, Vona Groarke, Leontia Flynn and David Wheatley will also be addressed. In focusing on all of these writers, the course will consider matters such as the poet's relationship to the nation and to the state; and the respective roles of landscape, memory, family, history, myth and gender in this variegated body of Irish literature.

EH4148 Science Fiction: Literature and Film (Elective Spring/4)

3 hours per week; 13 weeks 8th Semester 26L/13T; ECTS credits 6

In this module, students engage with key science fiction (SF) texts and critical statements on the genre. Referring to both written and filmic primary texts together with theoretical works, we examine SF's aesthetic forms and historical development with an eye to discerning its complex and multifaceted relationships to contemporary society. Through the methods of close reading, critical writing and pupil-led discussion, students will attend to the ways in which Western (especially Anglo-American) economy, politics and culture inform and shape specific texts and will explore in turn how SF shapes and critiques the societies in which its producers and readers live.

FR4142   French Language and Society 2: Introduction to French Studies 2   (Spring/1)

4 hours per week; 13 weeks/2nd semester; 13L/13T/26LAB; ECTS credits:6

The module builds on French Language and Society 1 through continuation of oral and written exercises on topics relating to contemporary France and the Francophone community. Continued revision of grammatical structures and introduction of more complex structures. Development of autonomous language-learning skills.

FR4146   French A5 (European Studies)*   (Spring/3)

4 hours per week; 13 weeks/6th semester; 26L/26T; ECTS credits:6

In depth study of the Fifth Republic through analysis of a variety of texts from the period; intensive language

activities include comprehension, linguistic analysis and translation. *Prerequisite FR4125*

FR4148 French Language & Society 6 Media/Current Issues (Spring/4)

The nature of communication and the media industries in France: general language classes will concentrate on text analysis oral presentation and debate in French: translation classes will focus on the study of different registers and discourses: students will study a modern film television broadcasts or work of literature:

FR4242   French 2A (Applied Languages)* (Spring/1)

4 hours per week; 13 weeks/2nd semester; 26L/26T; ECTS credits:6

The module builds on French A1 through continuation of oral and written exercises on topics relating to contemporary France. Continued revision of grammatical structures and introduction of more complex structures; development of autonomous language-learning skills.

FR4246 French Language Culture & Society 4 (Spring/3)

4 hours per week; 13 weeks/6th semester; 13L/39T; ECTS credits:6

Development of active and receptive language skills key moments in the history of post-war France revolutionary ideals in eighteenth-century France.

FR4248 French Language Culture & Society 6 (Spring/4)

4 hours per week; 13 weeks/8th semester; 13L/39T; ECTS credits:6

Communication and the media in France the written press cinema television and new technologies translation and the audio-visual media principles and practice in conference and bi-lateral interpreting theory and practice of literary translation:

FR4322 French for Business (Spring/1)

4 hours per week; 13 weeks/2nd semester; 26L/26T; ECTS credits:6

Use of authentic material (both written and oral) for tasks encountered in specific situations; focus in the following areas: organisational structures of firms; advertising, personnel management.
These modules are not suitable for French-speaking students.

FR4324 French for Business 4 (Spring/2)

4 hours per week; 13 weeks/4th semester; 26L/26T; ECTS credits:6

Use of authentic material (both written and oral) for tasks encountered in specific situations; focus is in the following areas; import and export, government taxes, social partners.

FR4422   French for Engineers 2A* (Spring/1)

4 hours per week; 13 weeks/2nd semester; 26L/26T; ECTS credits:6

Continuation of communicative ability through a variety of activities both oral and written; cross-cultural

awareness; introduction to examples of scientific communication; continuation of essential grammatical structures and basic vocabulary through CALL programmes. *Prerequisite FR4421*

FR4512 French for Computing 2 (Spring/1)

4 hours per week; 13 weeks/2nd semester; 39T/13Lab; ECTS credits:6

Continued development of oral and written language skills, in particular functional skills for successful participation in French University programmes in computing. Continued systematic study of the structures of French, with the emphasis on features such as prepositions and the various types of pronouns and on syntax and discourse structure. Study of advanced computing terminology in French through the reading of general and specialised authentic texts on computing-related topics; study of contemporary French society and culture in preparation for living and studying in France. *Prerequisite French for Computing 1*

FR4518 French for Computing 6* (Spring/4)

4 hours per week; 13 weeks/8th semester; 13L/26T/13L; ECTS credits:6

This module ''Médias, actualités et nouveaux medias'' will focus on the nature of communication and the media industries in France with students completing a specialised research topic; they will be offered webspace to create an electronic portolio for the completed work and for evidence of achievement as part of the student's C.V.

FR4622 Literature & Culture Twentieth-Century (Spring/1)

3 hours per week; 13 weeks/2nd semester; 13L/26T; ECTS credits:6

A study of four literary texts: works by authors such as the following will be included: camus sarte de beauvoir duras ionesco anouilh prevert cesare.

FR4626 French Literature and Culture 4 19th Century Art (Spring/3)

3 hours per week; 13 weeks/6th semester; 13L/26T; ECTS credits:6

The module will concentrate on the mid century to the first world war and will deal with topics selected from the following revolutions realism naturalism industrialisation positivism impressionism symbolism modernism: the module will focus on the representations of Paris during and following the second empire fin-de- siecle France and the period leading up to the first world war: students will study novels poetry and painting of this period: authors could include flaubert zola baudelaire mallarme proust: painters could include courbet manet monet renoir cezanne:

FR4922 French for Business 2A * (Spring/1)

4 hours per week; 13 weeks/2nd semester; 26L/26T; ECTS credits:6

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; focus on organisational structures of firms, advertising, personnel management. *Prerequisite FR4921*

FR4924 French for Business 4A* (Spring/2)

4 hours per week; 13 weeks/4th semester; 26L/26T; ECTS credits:6

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; focus is in the following areas: Import and Export, The Stock Exchange, Government Taxes.

FR4928 French for Business 8A* (Spring/4)

4 hours per week; 13 weeks/8th semester; 26L/26T; ECTS credits:6

This module entitled "La politique et la societé" looks at present day French politics. It examines French political institutions, the recent presidential elections and the attitudes of the French citizens to politics. Students are asked to take part in simulated debates on current socio-political issues and to write a profile of a political party. The in-depth study of the press and the television provides and ideal base for analysing the treatment of topical issues in the media from a language point of view; in this final module an external oral examination takes place to evaluate fluency and competence developed throughout all the modules *Prerequisite FR4927*

GA4105 Irish Folklore 1 (Spring/3)

4 hours per week; 13 weeks/4th Semester; 26L/26T; ECTS credits:6
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; traditional custom and belief including calendar customs. A case study in folklore collection based on field recordings made in county Limerick in 1980.

GA4115 Irish Language 1 (Spring/3)

5 hours per week; 13 weeks 4th Semester; 26L/39T; ECTS credits:6

An introductory course in communicative Irish, the language content of which is based on scientific research on frequencies of lexis, verbal forms and syntactical patterns in conversational Irish; the external history of the Irish language; introduction to early Irish literature.

GA4116 Irish Language 2* (Spring/3)

5 hours per week; 13 weeks/6th semester; 26L/39T; ECTS credits:6

A continuation course in communicative Irish based on texts and other materials in use in Irish postprimary schools; research in Irish place and family names; current position of Irish.
[See GA4115 (Autumn Semester) for the Irish language content for students taking Spring Semester only].

GA4134 Litríocht & Saíocht 2* (Spring/2)

3 hours per week; 13 weeks/4th semester; 26L/13T; ECTS credits:6

Courses on poetry in Irish: Bardic, 17th and 18th century and modern Irish poetry with particular reference to

literary, political, and social contexts. Additional study of the history of the Irish language.

GA4142 Teanga, Sochaí agus Saíocht 2* (Spring/1)

5 hours per week; 13 weeks/2nd semester; 26L/39T; ECTS credits:6

Go bhforbrófaí scileanna an mhic léinn sa léamh, sa scríobh, sa tuiscint agus sa labhairt le go mbeadh sé in ann bunchumarsáid chruinn nádúrtha a dhéanamh sa Ghaeilge ar chúrsaí reatha (cúrsaí sóisialta, polaitíochta, geilleagair, timpeallachta agus cultúrtha); go mbeadh tuilleadh de phrós agus de dhánta na linne seo léite; go gcothófaí tuiscint níos doimhne ar oidhreacht na Gaeilge i dtimpeallacht fhisiciúil agus shóisialta an lae inniu.

GA4146 Teanga, Sochaí agus Saíocht 4 (Spring/3)

4 hours per week; 13 weeks/6th semester; 26L/26T; ECTS credits:6

Go mbeadh tuiscint ag an mac léinn ar chanúintí, ar réimeanna teanga agus ar an gCaighdeán Oifigiúil; go mbeadh ar chumas an mhic léinn leagan inghlactha den Ghaeilge a ionramháil go cruinn agus go nádúrtha, agus go mbeadh máistreacht aige/aici ar Chaighdeán Oifigiúil na Gaeilge scríofa; go dtuigfeadh an mac léinn buncheisteanna na sochtheangeolaíochta; go mbeadh an mac léinn in ann aistriúchán cruinn Gaeilge a sholáthar ar ábhair éagsúla i mBéarla (nó i dteanga Eorpach eile); go léifeadh an mac léinn corpas den litríocht chomhaimseartha.

GA4148 Teanga, Sochaí agus Saíocht 6 (Spring/4)

4 hours per week; 13 weeks/8th semester; 26L/26T; ECTS credits:6

Go léireodh an mac léinn máistreacht iomlán ar na scileanna éagsúla teanga a bhí á gcothú agus á bhforbairt tríd an gcúrsa; go mbeadh tuiscint ag an mac léinn ar thopaicí reatha taighde i léann na Gaeilge.

GA4156 Litriocht agus Saiocht 1690-1850 (Spring/3)

3 hours per week; 13 weeks/6th semester; 39L; ECTS credits:6

Litríocht na Gaeilge ó dhara léigear Luimnigh go dtí an Gorta Mór; staidéar speisialta ar shaothar na mórfhilí (m.sh. Ó Rathaille, Ó Súilleabháin, Mac Cubhthaigh, Ó Doirnín, Raifteirí) agus ar théacsanna faoi leith (m.sh. 'Cúirt an Mheán Oíche', 'Caoineadh Airt Uí Laoghaire' agus Cín Lae Amhlaoibh Uí Shúilleabháin); na hamhráin ghrá agus an Aisling *Prerequisite Litriocht agus Saiocht 1250-1690*

GE4142 German Language and Society 2: Introduction to German Studies II (Spring/1)

4 hours per week; 13 weeks/2nd semester; 13L/13T/26LAB; ECTS credits:6

Lecture: Social, cultural and economic trends and institutions in the German-speaking countries in the post-war period; the German regions and regionalism; regional and social variation in the German language. *Tutorials*: a) analysis of literary texts to provide further access to the period while at the same time introducing reading techniques, principles of textual analysis and text discussion in oral and written form; *b) Contrastive grammar work continued. *Language laboratory*: exercises in pronunciation, listening comprehension and grammar utilizing CALL facilities

GE4146 Germany past and present (Spring/3)

4 hours per week; 13 weeks/6th semester; 13L/39T; ECTS credits:6

Lecture: German revolutions, democracy, fascism; cultural institutions, cultural life (book trade, theatres, music, cinema, fine art, media etc.), the cultural and literary heritage.
Tutorials: a) reading and discussion of literary texts supporting the lecture; b) conversation class or drama workshop; c) advanced grammar work.

GE4148 Issues and debates in the German speaking countries today (Spring/4)

4 hours per week; 13 weeks/8th semester; 13L/39T; ECTS credits:6

Lecture: political issues in unified Germany, Austria and Switzerland; dealing with the past; nationalism and national identity; economic, cultural and social debates (equality, environmentalism, cultural politics, social reforms, women's movement in Germany); political apathy and extremism.
Tutorials: a) discussions of literary texts, newspaper, magazine articles and TV programmes on topical issues focussing on the characteristics of different text types and language registers; b) issues in Austria and Switzerland incl. presentations in the foreign language; c) translation class English/German with a particular focus on the problem of registers.

GE4212 German for beginners 2 (Spring/1)

6 hours per week; 13 weeks/2nd semester;13L/52T/13L;ECTS credits: 6

Trends in post-war German society, culture and economy; institutions in the German speaking countries; the German regions and regionalism; regional and social variation in the German language; German drama and short story; further grammatical structures, functions and vocabulary; transfer of known structures to a variety of communicative contexts; consolidation of grammar and development of self-study skills to reinforce material covered during the course.
Prerequisite GE4211

GE4242 German Language, Culture and Society 2 (Applied Languages) (Spring/1)

2 hours per week; 13 weeks/2nd semester; 13L/13T; ECTS credits:6

Lecture: Postwar German-speaking countries; society and institutions; regional/social variations and developments in the German language; political geography; trends in postwar German culture and economy
Tutorial work: one hour textwork develops skills relating to textual analysis, grammar in use and writing, two short 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; one hour German linguistics relates general linguistic course to the German situation, focusing on past and current developments in the German language.

GE4246 German language, culture and society 4 (Spring/3)

4 hours per week; 13 weeks/6th semester; 13L/39T; ECTS credits:6

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); Text analysis & production: analysis & writing of reports and summaries; Translation theory and practice: historical and socio-political texts
Literature reading course: Students will read two pieces of literature related to the theme of the lecture. This will form the basis of 2 weeks' oral discussion work and one essay in German.

GE4248   German language, culture and society 6 (Spring/4)

4 hours per week; 13 weeks/8th semester; 13L/39T; ECTS credits:6

Lecture: cultural-political issues in unified Germany, Austria and Switzerland; dealing with the past; nationalism and national identity; economic, cultural and social debates such as equality, environmentalism, cultural politics, social reforms, political apathy and extremism.
Tutorial work: Oral presentation & discussion class: drawing on text and audio-visual materials to develop formal oral skills (presentations, talks, interviews). This hour will be alternated with a class providing an introduction to interpreting; Text analysis & production: analysis & writing of project proposals, evaluations, etc.;Translation theory and practice: advertising, commercial and literary texts.
Literature reading course: Students will read two pieces of literature related to the theme of the lecture. This will form the basis of 2 weeks oral discussion work and one essay in German.

GE4322   German for Business 2B (Spring/1)

4 hours per week; 13 weeks/2nd semester; 13L/39T; ECTS credits:6

Further development of oral and communicative skills and enhancement of vocabulary base through the use of authentic situations, actions and dialogues; greater emphasis on development of written proficiency and the transfer of acquired language skills to different communicative situations in a business context; broadening the students knowledge of German culture through selected themes in the course material.

GE4324   German for Business 4B (Spring/2)

4 hours per week; 13 weeks/2nd semester; 13L/39T; ECTS credits:6

Examination of the internal structure of a cross-section of German firms, their administrative organisation and functions of their various departments; preparation and oral presentation of a short case-study based on a local or German firm; introduction to the elements of commercial correspondence and office procedure, tendering, ordering, processing invoices. *Prerequisite: GE4323*

GE4412/GE4512 German for Engineering/Science 2 (Beginners)* (Spring/1)

6 hours per week; 13 weeks/2nd semester; 13L/52S/13LAB; ECTS credits:6

Introduction of further grammatical structures and vocabulary. Development of all four language skills through individual, pair and group work. Transfer of known structures to a variety of communicative contexts. One hour a week is self-access and students are encouraged to use such facilities in their own time to consolidate the learning process. *Prerequisite GE4211*

GE4422 German for Engineers 2 (Spring/1)

4 hours per week; 13 weeks/2nd semester; 26L/26T; ECTS credits:6

The module provides students with further opportunities to revise and consolidate their prior language knowledge. Video and text material will be exploited to develop students' ability to operate within a work environment in Germany and to revise in more depth both the grammatical structures and vocabulary necessary to cope with everyday situations. As in GE4421, students will be required to spend at least one hour per week in addition to their three contact hours working on a self-access basis. Students will be introduced to the use of the Internet and CD-Roms for language-learning purposes. *Prerequisite GE4421*

GE4424 German for Engineers 4A (Spring/2)

3 hours per week; 13 weeks/4th semester; 26L/13T; ECTS credits:6

Students work with a variety of text types (general, popular scientific, semi-technical) to increase their awareness of different registers and approaches to presenting technical information. Texts will also be exploited as a basis for basic report, summary and translation work. Students will be encouraged to expand their knowledge of basic subject specialism terminology. Students will be expected to read and discuss longer texts on issues relating to their potential work environment and to undertake projects and presentations on the background and industrial context of the companies for which they will be working on placement. Students will be expected to make full use of Internet facilities and will also be encouraged to enter into email contact with students of Mechanical Engineering in Germany as a basis for projects of common interest. *Prerequisite GE4423*

GE4426 German for Engineers 5A (Spring/3)

4 hours per week; 13 weeks/6th semester; 13L/39T; ECTS credits:6

Two hours per week will be spent on text work, developing skills in relation to the reading and writing of reports summaries and project proposals emphasis will be placed on the effective use of technical dictionaries and the consolidation of basic subject specialism terminology; one hour will concentrate on simulated situations such as project meetings, formal presentations, etc

GE4622   Text, writer and reader (Language & Cultural Studies) (Spring/1)

2 hours per week; 13 weeks/2nd semester; 13L/13T; ECTS credits:6

Lecture: what is a text? the process of reading; intertextuality; reception of literature; literature and politics, 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, drama and poetry as examples

GE4626 19th Century German Literature (Spring/3)

3 hours per week; 13 weeks/6th semester; 26L/13T; ECTS credits:6

To examine some 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. A study of Classicism in drama and poetry and its relationship to preceding movements. 'Enlightenment' and 'Sturm und Drang'; Poetic Realism (1850-1890) in its social context - industrialisation, urbanisation, growth of the middle classes; and Impressionism as an expression of the mood of pessimism at the turn of the century and its role in the 'Wilhelminische Zeit' prior to World War I.

GE4922 German for Business 2A (Spring/1)

4 hours per week; 13 weeks/2nd semester; 26L/26T; ECTS credits:6

Using authentic materials simulating a business environment, students are asked to deal competently with tasks in specific communicative situations; introduction to the organisational structures of firms in Germany; emphasis on developing telephone techniques and other work-related interactive skills.
Students will also continue to learn more about the cultural side of German life and work on improving their language skills with an emphasis on writing and speaking
Prerequisite GE4921

GE4924 German for Business 4A (Spring/1)

4 hours per week; 13 weeks/4th semester; 26L/26T; ECTS credits:6

Dealing with commercial correspondence from processing an initial enquiry through to coping with non-payment of invoices; filling in official forms/documentation; introducing the following business areas: advertising, import and export. Preparation of CV's and letters of application. Regular discussion of current affairs to improve awareness of changes in the German economy and society.
Prerequisite GE4923

GE4928 German for Business 7 (Spring/4)

4 hours per week; 13 weeks/8th semester; 26L/26T; ECTS credits:6

Consolidation of language skills acquired in the course of the previous semesters; examination of the institutions and policies of the EU with particular reference to Germany's role within the EU, Irish-German trade and the implications of the Single Market; presentation of economic and social issues by the German media; revision of the following: business material in general, the skills of translation, and summarisation of texts. In this final module, an oral examination with the External Examiner evaluates fluency and competence developed throughout the German stream; students must pass this examination in order to complete this module successfully
Prerequisite GE4927

GY4016 Economic Geography (Spring/3)

3 hours per week; 13 weeks/6th semester; 26L/13T; ECTS credits:6

The economy and economic geography; manufacturing activity and least cost location theory; Weberian location theory; transportation cost as a factor of location; production costs and location; scale and agglomeration; spatial behaviour of large organisations; deindustrialisation and tertiatisation; nature of service activity; market area analysis; central place theory; quaternary activities and office location; location and public policy.

GY4018 Historical Cultural Geography of Modern Ireland (Spring/4)

3 hours per week; 13 weeks/8th semester; 26L/13T; ECTS credits:6

An exploration of Irishness in the landscape, past and present; names of places; signatures and people; signs and symbols; landscape as clue to culture; seeing things; history matters.

GY4021   Regional Geography   (Spring/1)

3 hours per week; 13 weeks/2nd Semester; 26L/13T; ECTS credits:6

The EU; general review of issues and problems, institutions, policies and funding; regional disparity; frontier regions; the core-periphery model; North America; Canadian regionalism in life and letters; ethnic and religious cleavages in the US; wealth, poverty, crime.

GY4023 Geography of Development (Spring/2)

3 hours per week; 13 weeks/2nd Semester; 26L/13T; ECTS credits:6

Conceptions of Development, unity and diversity with respect to the major physical, social, economic and political characteristics if developing societies; the historical roots of underdevelopment; the bases of contemporary political and economic domination of the developing world by the developed world with particular attention to the role of trade, multi-national corporations, aid and debt and the necessity for balanced interdependence, the position of elites, the role of demography, urban development

HI4012   The Ascendancy of Modern Europe 1789-1914 (Spring/1)

3 hours per week; 13 weeks/2nd semester; 26L/13T; ECTS credits:6

The congress of Vienna and the era of Metternich; the progress of industrialisation; theories of social change - liberalism, conservatism socialism; the politics of nationalism - Germany, Italy and Ireland; emancipation, reform and repression in Russia; the Age of equipoise - Britain; Imperialism; the coming of war.

HI4018   Ireland: Revolution and Independence* (Spring/4)

3 hours per week; 13 weeks/8th semester; 26L/13T; ECTS credits:6

Irish nationalism in 1900; war and upheaval ; the end of the union; Independent Ireland - the two states; the economic and social impact of partition; De Valera's Ireland; the emergency and war; the re-opening of 'Platos Cave' the post-war economy and society, the politics of change - coalition governing and the declaration of the Republic; and analysis of the contrasting worlds of the Republic and Northern Ireland in the 1950's and 1960's.

HI4022   The History of Social and Technological Change 11   (Spring/1)

3 hours per week; 13 weeks/2nd semester; 26l/13T; ECTS credits:6

The end of the old order, 1914-1921; the World War I and its consequences for the world economy, post war theories of economic development, interdependence and planning; boom and depression in the United States of America and in Europe; National Socialism and Fascism; the 'new deal' and the origins of the modern 'welfare' policies; developed and underdeveloped societies, comparisons and contrasts; foreign aid and other sources of growth in global recovery; the changing locus of power; after the 'cold war', the crisis of capitalism and industrial society; toward the twenty first century.

HI4026   Europe in the Wider World* (Spring/3)

3 hours per week; 13 weeks/6th semester; 26L/13T; ECTS credits:6

The Cold War; the extension of the Soviet sphere of influence; soviet - satellite relations; the conduct of Soviet foreign policy; the pursuit of detente in the 1970's and the CSCE process; approaches to colonialism - France, Britain, the Netherlands and Portugal; post-colonial developments and new-colonialism; the imperial legacy and the unequal world; Euro-Arab relations since 1948; European/Japan relations; Irish foreign policy 1945-60.

HI4036 The Emergence of Modern Ireland 1534-1798 (Spring/3)

3 hours per week; 13 weeks/6th semester; 26L/13T; ECTS credits:6

Anglo-Irish and Gaelic lordships; Tudor reform, Reformation and Counter Reformation, conquest and settlement; the three kingdom crisis; 1641; Catholic Confederates, Cromwellian re-conquest; 'The War of the Three Kings'; Protestant nationalism; the vision of the vanquished and the Aisling tradition; demographic, social and economic trends; parliamentary reform, the Catholic question and the United Irishmen; sectarian conflict; the 1798 rising.

HI4067 State and Society in Post-Modern Europe (Spring/4)

3 hours per week; 13 weeks/7th semester; 26L/13T; ECTS credits:6

The uses of public power characteristic of European society during its transition to late, or post, modernity, will be illustrated by use of selected examples from both western 'welfare states' and eastern state socialism. The course will explain the former pre-eminence of the nation-state as a means of controlling the economic and cultural determinants of modern European life, and discuss its subsequent demise. Students will be offered liberation from the conceptual and methodological constraints of comparative politics and sociology, and from positivist and historical approaches to legitimising the social condition of late capitalism. There will be a critical review of forces, movements and practices that might be understood as constructing a new politics; students will be able to select case studies of these for the purpose of special presentations e.g. feminism, culturalism and regionalism, the ecology movement, issues of 'life politics' aestheticism, etc.

HI4072 Europe: Imperialism and Decolonisation (Spring/2)

3 hours per week;13 weeks/3rd semester;26 L/13T;ECTS credits: 6

The following themes will be examined: the historiography of colonialism and imperialism; understanding the concepts; the economics of colonialism; the framework - emigration, religion, education, culture, sport, economy; Ireland and the wider world 1850-1921; the conduct of empire - France, Britain; women - agents of empire; the retreat from empire; Ireland and the wider world after 1922.

HI4082 Europe: Society and Governance (Spring/2)

3hours per week;13 weeks;26L/13T;ECTS credits:6

War, revolution, restoration 1914-24; democracy/dictatorship and war 1924-44; American money and reconstruction; decadent decade? depression and sobriety; political mobilisation and violence; authority restored; conservatism/fascism/Stalinism; the twenty-year crisis: international relations; the Nazi new order and total war; Holocaust; reconstruction and Cold War; 1945: Europe's 'zero hour'? re-establishing order: the European economy and culture; the 'second sex': youth, political protest and cultural revolt; the post-post war society and state; rebuilding the European house: Thatcher and Gorbachev; race, ethnicity, and memory; after the Wall: the return of 'Europe'.

HI4099 History of Modern Australia 1788-1918 (Spring/4)

3 hours per week; 13 weeks/8th semester; 26L/13T; ECTS credits:6

To examine the formative experiences in the creation of Australian National identity. The establishment of a penal colony in New South Wales in 1788 and it's consequences down to 1918; exploration of Aborogianl society; transportation law and experience – who were the convicts? Irish and British criminals in Port Jackson, Van Diemen's Land and Moreton Bay; recidivists and revolutionaries, women and children, emancipists, free settlers, busrangers and gold diggers; colonial expansion and conflict; the Tasmanian 'Black War', Myall Creek, Eureka stockade and the Kelly outbreak; statehood, federation and the anzac tradition.

HI4102 Ireland: Revolution and Independence, 1898-1968 (Spring/2)

3 hours per week;13 weeks/3rd semester;26L/13T;ECTS credits:6

Origins of the modern physical force tradition; resistance to change; Sinn Féin and the Irish Volunteers, 1916 Rising and its aftermath; 1918 Election and the first Dáil; War of Independence, Partition and Civil War, Free State and Stormont; economic unrest; Ireland and the Second World War; Fianna Fáil and the constitution; the Republic, IRA and the Border Campaign; civil rights in Ireland.

HI4112 Sources for History (Spring/2)

3 hours per week;13 weeks/3rd semester; 26L/13T;ECTS credits: 6

Historians and their sources; public and private archives; origins, ideologies and holdings: the scope of national, regional and private archives; the range and scope of electronically available source materials; oral, audio, visual, pictorial sources and archives: the identification,

location, accession, and critical evaluation and use of sources; forgery, fabrication and the historian; the withdrawal, suppression and destruction of sources; the practicalities of archive use, access, availability, procedure and professional practice: the appropriate citation of sources.

HU4012 Business and Society 2* (Spring/1)

3 hours per week: 13 weeks/2nd semester; 26L/13T; ECTS credits:6

1914; the end of the old Europe; the post-war political order; new democracies, socialism and totalitarianism; creating a new economic order; the new welfare states; new demographic patterns; changes in the structure and functions of families and social classes; de-industrialisation, changing patterns of dependency, poverty and the urban crisis; the quest for stability and consensus; the visual arts, industrial and architectural design, music and literature; Europe's place in a changing world order; responses to totalitarianism, socialism and global underdevelopment; towards the twenty first century.

HI4112 Sources for History

3 hours per week; 13 weeks/8th semester; 26L/13T; ECTS credits:6

Historians and their sources; public and private archives; origins, ideologies and holdings: the scope of national, regional and private archives; the range and scope of electronically available source materials; oral, audio, visual, pictorial sources and archives: the identification, location, accession, and critical evaluation and use of sources; forgery, fabrication and the historian; the withdrawal, suppression and destruction of sources; the practicalities of archive use, access, availability, procedure and professional practice: the appropriate citation of sources.

HI4032 Capitalism and Industrial Society, 1450-1900 (Spring/1)

Agriculture, power and printing; a European mentalité? feudalism, craft and capitalist production; navigation, a world economy, mercantilism; demography and the agricultural revolution; invention and innovation in metal, mining, textiles, power, transport; social change; Marx and technological determinism, location and timing of industrialisation; the invention of invention; the built environment; communications and transport; public health and modern medical innovation; the mechanization of food supply.

HI4082 Europe: Society and Governance (Spring/3)

3 hours per week;13 weeks/3rd semester; 26L/13T;ECTS credits: 6

War, revolution, restoration 1914-24; democracy/dictatorship and war 1924-44; American money and reconstruction; decadent decade? depression and sobriety; political mobilisation and violence; authority restored; conservatism/fascism/Stalinism; the twenty-year crisis: international relations; the Nazi new order and total war; Holocaust; reconstruction and Cold War; 1945: 15 Europe's 'zero hour'? re-establishing order: the European economy and culture; the 'second sex': youth, political protest and cultural revolt; the post-post war society and state; rebuilding the European house: Thatcher and Gorbachev; race, ethnicity, and memory; after the Wall: the return of 'Europe'.

HI4102 Ireland: Revolution and Independence, 1898-1968 (Spring/3)

3 hours per week;13 weeks/3rd semester;26L/13T;ECTS credits: 6

Origins of the modern physical force tradition; resistance to change; Sinn Féin and the Irish Volunteers, 1916 Rising and its aftermath; 1918 Election and the first Dáil; War of Independence, Partition and Civil War, Free State and Stormont; economic unrest; Ireland and the Second World War; Fianna Fáil and the constitution; the Republic, IRA and the Border Campaign; civil rights in Ireland.

HI4072 Europe: Imperialism and Decolonisation (Spring/4)

6 hours per week;39L/39T/3rd semester;ECTS credits: 6

The following themes will be examined: the historiography of colonialism and imperialism; understanding the concepts; the economics of colonialism; the framework — emigration, religion, education, culture, sport, economy; Ireland and the wider world 1850-1921; the conduct of empire — France, Britain; women — agents of empire; the retreat from empire; Ireland and the wider world after 1922.

HI4092 Tools and Methods in Historical Research

An introduction to contemporary debates on the nature of historical research including revisionism, ideology and the history of gender and women; world, national and local history; judgement, causation; historical facts, imagination and empathy. developments in the use of historical sources; machine based processing and analysis of historical data; introduction to historical data retrieval and analysis packages for the computer.

HU4013: Computers and the Social Sciences (Spring/1)

4 hours per week; 13 weeks/2nd Semester; 26L/26LAB; ECTS credits:6

Examination of the implications of the computer revolution for learning and research in the social sciences; electronic communication and the interrogation of bibliographic and other databases.

JA4212 Japanese Language, Culture and Society 2 (Spring/1)

6 hours per week;39L/39T;2nd semester;ECTS credits:6

Listening exercises dealing with street directions descriptions of places, abilities and family; speaking practice emphasising talk about one's own and others' families, descriptions of places; reading descriptions of towns in Ireland and Japan, and passages about Japanese sport, and pastimes; writing more complicated passages about family and place, also pastimes; study of at least a further 80 kanji; discussion of further aspects of Japanese society.
Prerequisite JA4211

JA4216 Japanese Language, Culture and Society 4 (Spring/2)

6 hours per week;39L/39T/3rd semester;ECTS credits: 6

Listening practice, particularly authentic broadcast news; speaking at various levels of formality and with correct nuances of regret etc; reading authentic essays and news

stories or near authentic material relating to contemporary Japanese life; writing descriptions, summaries, memos, faxes and e-mails; use of a further 250 kanji to bring the total up to 500 characters.
Prerequisite JA4213

JA4218 Japanese Language, Culture and Society 6 (Spring/4)

6 hours per week;13 weeks;7th semester;39L/39T;ECTS credits: 6

Listening practice using a variety of authentic texts; further practice in the use of polite language; presentations, summaries of material heard and read practice for interviews; vocabulary consolidation; reading of authentic news stories, and literature. Translation of a variety of authentic passages; practice in writing summaries, descriptions, letters, and passages expressing opinions; study of a further 100 kanji, to bring the total up to 750 characters.
Prerequisite JA4217

JA4512 Japanese for Engineering & Science 2* (Spring/1)

6 hours per week; 13 weeks/2nd semester; 26L/39T/13LAB; ECTS credits:6

Vocabulary expansion through role-playing and language laboratory exercises; basic grammatical structures; consolidation of kana reading and writing; introduction of a further 75 kanji; basic conversation skills; communication over the telephone; basic descriptive writing.

JA4912   Japanese for Business 2 (Spring/1)

6 hours per week; 13 weeks/2nd semester; 26L/39T/13LAB; ECTS credits:6

Vocabulary expansion through role-playing and language laboratory exercises; simple telephone conversation skills: invitations, appointments, messages; introduction of a further 100 kanji; basic descriptive writing, such as describing a city; basic grammatical structures including verbal plain forms.

JA4914   Japanese for Business 4 (Spring/2)

6 hours per week; 13 weeks/4th semester; 26L/39T/13LAB; ECTS credits:6

Expansion of verb-following phrases through functional exercises; written exercises focusing on explanations of native customs and society; comprehension of the Japanese cultural context through audio-visual materials; further basic grammatical structures; introduction of a further 100 kanji (total 350)

JA4918   Japanese for Business 8 (Spring/4)

6 hours per week; 13 weeks/8th semester; 26L/39T/13LAB; ECTS credits:6

Preparation for applying for a job in Japan, e.g., interview exercise through role playing; business correspondence and communication, e.g., CV and letter of application; introduction of intermediate grammatical structures including basic polite language, i.e., judging when to be used and how to be adjusted according to whom is being addressed; introduction of a further 100 kanji.

JM4002 Professional Skills for Journalism 2 (Spring/2)

3hours/per/week;13weeks/2nd emester;13L/26T;ECTS credits:6

Professional Skills for Journalists 2 Students will generate their own stories and develop them in news and features conferences. They will develop their skills in design for print and websites and editing and handling pictures. They will design pages in a wide variety of styles for magazines and newspapers, using their own material from Journalistic Writing 2, and using their own photographs and other illustrations. They will develop their knowledge of writing for broadcast.

JM4012 Journalistic Writing 2(Spring/1)

3   hours   per   week;13   weeks;/2nd semester;13T/26L;ECTS credits:6

The course covers a variety of journalistic forms including short features, profiles of each other and visiting speakers, vox pops, and reviews of music, clubs or bars. Students will reflect on and analyze each other's work and professional output through their own blogs and a course web forum. Regular news writing workshops will continue, including one on a breaking news exercise and a wrap story exercise.

JM4442 Shorthand 2 (Spring/1)

4 hours per week;13 weeks;52L;ECTS credits:6

Building on Shorthand 1, this module explores the different contexts within which professional journalists regularly use shorthand (such as courts, council meetings, Dáil) and the value of shorthand notes as legally acceptable evidence. Through further regular practice, students: develop listening skills further, deepen knowledge of a recognised form of shorthand, learn to read and transcribe their notes fluently and accurately. Students rectify any final challenges in relation to language skills and practise shorthand skills regularly through independent work.
Prerequisite JM4441

LA4002 Jurisprudence
                                                      LAW
Students will acquire a variety of theoretical perspectives on law through an examination of its nature and operation and an analysis of key concepts and issues. 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*   (Spring/1)

3 hours per week; 13 weeks/2nd semester; 26L/13T; ECTS credits:6

The idea of law; legal concepts; historical development of common law; early Irish law; Roman law; civil law; some fundamental concepts: German/French/Spanish / Scottish legal systems - an introduction; how a civil lawyer finds the law; American legal system: other conceptions of law and the social order.
Prerequisite LA 4001 Legal System and Method

LA4022 Commercial Law (Spring/1)

3 hours per week; 13 weeks/2nd semester; 26L/13T; ECTS credits:6

Review of US anti trust legislation, enforcement mechanisms, the relationship between intellectual property rights and competition abuses; remedies at law and equity; alternative mechanisms for dispute resolution, arbitration, private courts, negotiation; bankruptcy, personal versus corporate, historical evolution, philosophical basis, bankruptcy Act 1988, comparative views for the US.

LA4035 Labour Law (Spring/3)

3 hours per week; 13 weeks/5th semester; 26L/13T; ECTS credits:6

Nature of labour law; legal classification of the provision of labour; the role of statute in labour law; protective legislation and conditions of employment, redundancy, minimum notice and unfair dismissal; Trade Unions, legal regulation thereof, worker participation, EU developments; courts and tribunals in labour law.

LA4122 Contract Law 2 (Spring/1)

3 hours per week; 13 weeks/2nd semester; 26L/13T; ECTS credits:6

Vitiating factors; mistake; misrepresentation; fraud; duress; undue influence; discharge of obligations: by performance; by agreement; by breach; by frustration; remedies for breach of contract: specific performance; damages; rectification; recession; assignment of contract obligations; agency; quasi-contracts.

LA4126 Cival Liberties (Spring/3)

3 hours per week; 13 weeks/6th semester; 26L/13T; ECTS credits:6

Fundamental concepts of human rights and civil liberties, police powers, freedom of assembly and public order, emergency powers, immigration and asylum rights, due process and access to justice, freedom of expression, freedom of information and government secrecy, protection of privacy, freedom from gender and racial discrimination, the Human Rights Act 1998 and the European Convention on Human Rights, other international mechanisms for the protection of human rights.

LA4222 Criminal Law 2* (Spring/1)

3 hours per week; 13 weeks/2nd semester; 26L/13T; ECTS credits:6

Murder and manslaughter; non-fatal offences against the person: assault and battery; aggravated assaults; false imprisonment; kidnapping; sexual offences: rape; unlawful carnal knowledge of minors and others; indecent assault; offences against property: arson; criminal damage; burglary; larceny; aggravated larcenies; robbery; false pretences; embezzlement; fraudulent confession; handling stolen property; offences against the administration of justice: perjury; contempt of court; offences against the public peace; riot and affray; criminal libel; offences against the State; treason; sentencing; elements of criminal procedure: bail; extradition; police powers.

LA4226 Court Practice and Procedure (Spring/3)

3 hours per week; 13 weeks/6th semester; 26L/13T; ECTS credits:6

Court Rules; Terms of Law; Pretrial Actions and Pleadings; Discovery in Civil and Criminal Matters; Motions; Injunctions; Witnesses; Expert, lay and Garda, Jury and Non Jury Trials; Rules of Evidence, Proof, Testimony, Hearsay and exceptions; Actual Trial, Order of Appearance, Opening, Examination in Chief, Cross, Re-examination, Objections, Summations; Verdicts and Judgements; Enforcement of Judgements.

LA4320 Law of Torts 2* (Spring/1)

3 hours per week; 13 weeks/2nd Semester; 26L/13T; ECTS credits:6

Specific torts: trespass (to the person, land or 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.

LA4410 Public Law 1 (Spring/2)
3 hours per week; 13 weeks/2nd Semester; 26L/13T; ECTS credits:6

The historical background to the 1937 Constitution; the legal nature of the Constitution; the legal personality of the State; sovereignty; the juridical nature of the claim to territory in Articles 2 and 3. Separation of powers; office of the President; the Oireachtas; the Dáil; the Seanad; the executive. The law of local government. International relations and membership of the EC; judicial power; constitutional litigation; constitutional interpretation.

LA4420 Public Law 2* (Spring/1)

3 hours per week;13 weeks 2nd Semester; 26L/13T; ECTS credits:6

The trial of offences; due process of law; the guarantee of equality; personal rights; the family; education; religion; probate property; judicial review of administrative action remedies for breach of constitutionally protected rights; international regimes for the protection of rights.

LA4520 Law of Business Association 2*   (Spring/1)

3 hours per week; 13 weeks 2nd Semester; 26L/13T; ECTS credits:6

Capital of a company; shares and membership rights; borrowing by the company; types of security and relative priorities; administration of a company; directors; fraudulent and reckless trading; insider dealing; investigations; winding up.

LA4620 Land Law 2 (Spring/4)

3 hours per week; 13 weeks/8th Semester; 26L/13T; ECTS credits:6

The concept of public control on the use, transfer and development of real property, methods of real property transfer of ownership, public restrictions on the use of real property; landlord and tenant law, nature and creation of the relationship, determination of the relationship, statutory control of tenancies, public welfare codes; the laws relating to succession, statutory control of the right to devolve property upon death, wills and intestacies.

LA4720 EC Law (Spring/1)

3 hours per week; 13 weeks 2nd Semester; 26L/13T; ECTS credits:6

The law of the economy - concept and scope, the law of the economy under the EC Treaty; the concept of the common market/internal market; the Customs Union, Common Customs Tariff, Common Commercial Policy; four Freedoms - goods, persons, services, capital and payments; policies of the EC including - Agriculture, Competition, Transport, Social Labour law; consumer and environment; approximation of laws.

LA4722/LA4942   EU Law (B) (Spring/1)

3 hours per week; 13 weeks/2nd Semester; 26L/13T; ECTS credits:6

The Treaties of the European Communities; merger, accession, amendment; the nature of the Communities; personality, liability, immunities, external relations; the Institutions; the Council of Justice; the Court of First Instance; the Court of Auditors; Ireland and the EU; constitutional referenda; method of incorporation; the European Communities Acts, 1972-1993; statutory instruments; the Oireachtas Joint Committee on the Secondary legislation of the European Communities; the relationship between Community and National Law.
Prerequisite LA4001

LA4828 Equity and Trusts 2* (Spring/4)

3 hours per week; 13 weeks/8th semester; 26L/13T; ECTS credits:6

The trust, classifications of trusts, express, implied, resulting, constructive and charitable trusts; the requirements of a trust, the constitution of trusts; general principles relating to trustees, their obligations and duties, powers of trustees, variations in a trust, fiduciary responsibilities of trustees; breach of trust and remedies thereof.

LA4918   Company Law (Spring/4)

3 hours per week; 13 weeks/8th Semester; 26L/13T; ECTS credits:6

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, director' 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.

LA4922 Sport and the Law (Spring/1)

3 hours per week; 13 weeks/2nd semester; 26L/13T; ECTS credits:6

Elements of a valid contract: offer, acceptance, consideration, formality, legality; terms and conditions; standard form sports contracts; enforcement mechanisms and remedies for breach of contract; doctrine of restrains to trade; EU competition law and policy as applied to sport; criminal law and sport; manslaughter, assaults and batteries; public order offences; fraud related offences; sports governance: discipline; tribunals and natural justice; judicial review of sports' association action.

LI4212   Linguistics 2* (Spring/1)

3 hours per week; 13 weeks/2nd semester; 26L/13T; ECTS credits:6

Language and world-view; cognitive aspects of language categorisation; linguistic universals - typology; contact phenomena - bilingualism; pidgins, Creoles, second-language learning; ideological issues - language planning, purism, language and power, feminist critiques.
Prerequisite LI4211 Linguistics 1

MU4136/MD4022 Irish Traditional Music 2 (Spring/3)

3 hours per week; 13 weeks/6th semester; 26L/13T; ECTS credits:6

Repertoire and style in instrumental and voice tradition; the Irish Harp; traditional music and society in contemporary Ireland

PA4011   The Civil and Public Service (Spring/1)

3 hours per week; 13 weeks/2nd Semester; 39L; ECTS credits:6

Constitutional and legal position of the public service; growth of the public service; the structure of the public service; the civil service; 'ministerial responsibility'; government departments; the civil service and the policy process; co-ordination and control; the profession of government; recruitment and promotion; staff development; rights and duties of civil servants; ethical dilemmas in the civil service; the civil service in comparative perspective.

PA4013 Local Government (Spring/2)

3 hours per week; 13 weeks/3rd semester; 26L/13T; ECTS credits:6

The nature and purpose of local government; historical development of Irish local government; local government in the politico-administrative system; local government areas and structures; elections and politics; the management system in theory and practice; local government finance and audit; issues in Irish local government.

PA4018   The Public Policy Process (Spring/4)

3 hours per week; 13 weeks/8th semester; 39L; ECTS credits:6

Policy-making in an organisational society; an overview of organisation theory; organisation theory and the public sector; inter-organisational networks, models of decision-making in government; theories of the state; the state, social forces and the distribution of political power in Ireland; agenda setting and the emergence of issues; the public policy process in Ireland; public management; planning, co-ordination and management on the public policy process.

PA4038 Public Administration in Democratic States (Spring/4)

6 hours per week; 13 weeks/8th semester; 39L/39T; ECTS credits:6

Overview of the main themes in comparative public administration. Discussion on the role of the state in society. Analysis of models of politico-administrative

relations in European countries. Discussion of internal organisation of the administration in different European countries. Review of processes of change and innovation in public management in selected countries.

PL4013 Community Development (Spring/2)

3 hours per week; 13 weeks/3rd semester; 26L/13T; ECTS credits:6

Theories and concepts of community development; economic and social perspectives on development; state and community in modern Irish society; history of community development in Ireland; the cooperative movement; community development in rural and urban areas; EU inititiaves and national policy in respect of local and community development; the partnership concept; the impact of community development.

PO4013 Government and Politics of Ireland (Spring/1)

3 hours per week; 13 weeks/2nd Semester; 39L; ECTS credits:6

Historical introduction to the economic, cultural and social background of Irish politics; economic, social and political change; Irish political culture; constitutional development; development of political parties and evolution of the party system; electoral behaviour; social bases of party support; overview of the principal political institutions, including the Presidency, Oireachtas, Government, Taoiseach and the Civil Service

PO4015   Government and Politics of the EU (Spring/3)

Examines the development of the EC/EU as a political system from the aftermath of the second World War until the Maastricht Treaty; the institutional system of the EC/EU including the decision-making procedures; the interaction between the EC/EU and the politico-administrative systems of the member states; and the ongoing debate on institutional reform in the EC/EU in the IGC.

PO4016 Issues of European Integration (Spring/4)

3 hours per week; 13 weeks/6th semester; 26L/13T; ECTS credits:6

The main problems and obstacles encountered, since the end of the first transitional period of the EC Treaty, in realising the principles and objectives of the European Community; the political-institutional problems that the Community faces the major initiatives aimed at constitutional reform: Draft Treaty on European Union, the Single European Act and the Maastricht Treaty; the economic and political problems; the completion of the internal market, reform of the common agricultural policy, proposals for economic and social cohesion, the community budget and own resources, foreign and security policy, and enlargement.

PO4022   Modern European Political Thought (Spring/1)

3 hours per week; 13 weeks/2nd semester; 26L/13T; ECTS credits:6

The origins of the State, including the political thought of Machiavelli and Hobbes; the Enlightenment project and the rise of nationalism in European thought; The place of Utopian thought in the formation and development of European political ideas; the form of the liberal state and its place in liberal political economy; Marxist analyses of the liberal state; liberal, socialist and anarchist alternatives to the liberal state; environmental politics and the Green challenge to the current liberal political order; the different forms of feminist thought; the post modern condition and the role of the state at the end of the modern era.

PO4048 Issues in World Politics (Spring/4)

3 hours per week; 13 weeks/8th semester; 26L/13T; ECTS credits:6

The major theoretical and methodological debates in international relations: the roles of realism, liberalism, critical theory, feminism and postmodernism; the new global political economy and North-South relations; nationalism, ethnicity and democratisation in global context; post-Cold War security.

PO4108 Multiculturalism and Political Theory

3 hours per week;13 weeks;26L/13T;ECTS credits:6

PO4108 Multiculturalism and Political Theory

3 hours per week;13 weeks;26L/13T;ECTS credits:6

This module examines recent debates about citizenship, pluralism and cultural diversity, from the perspective of political theory. During the course we will critically evaluate a range of alternative justifications for multicultural political policies, and explore how they relate to other important political concepts, such as democracy, freedom, equality, justice, pluralism and respect. To that end, we will explore some of the various rights claims and policy proposals that have been called for by (and on behalf of) minority cultural communities, and investigate how these measures challenge traditional political theories and the practices of existing liberal-democracies. Upon completion of the module you should be able to critically evaluate the various justifications that have been offered for minority cultural rights, and understand a range of arguments for and against multiculturalism. Furthermore, you should have a deeper grasp of some important political concepts, including freedom, equality, justice, respect, recognition, toleration, and identity.

PO4008 African Politics: Development and Democracy

3 hours per week;13 weeks;26L/13T;ECTS credits:6

This module will supply an introduction to major political trends in contemporary Africa. Against a brief historical review of African state institutions since the advent of colonialism the course will explore successive efforts to modernise predominantly peasant economies, using Tanzanian experience as a case study. The factors that many critics believe have helped to contribute to the persistence and accentuation of African poverty will be assessed: these include poor macro economic management, weak institutions, and disadvantageous patterns of historically entrenched primary commodity production. Discussion of the very rapid expansion of African cities (in certain cases tenfold over the last two decades) will complete the background against which the subsequent parts of the course will explore contemporary African politics.

Two different but related kinds of reform have predominated since 1990: the liberalisation of heavily state interventionist economies and the introduction of competitive procedural democracy. Through case studies we will explore the consequences of both sets of developments. In the long term is market reform likely to invigorate African economies and will democracy help to

increase state capacity? Another dimension of African politics during the 1990s has been the increase in violence with mainly civil warfare reaching an historic peak in the continent towards the end of the decade. Where conflicts have been resolved how has this been achieved and where they have not for what reasons? Is there a common set of factors that explain the proliferation of African warfare and if so are these related to democratisation and market reform? Have these reform diminished the extent of patrimonial politics and have they expanded the space in which new kinds of social movement can exert influence?

PO 4058: Politics of the Third World

The module aims to introduce the student to the problems of, and prospects for, economic and political development in the Third World. At the outset, the concept of a "Third World" is explored and some of the theoretical and ideological precepts underlying relative underdevelopment are analysed. Political instability, revolutionary change and faltering progress towards democratisation are set in the context of a globalisation that appears to perpetuate Third World vulnerabilities. The module will be comparative and analytical in its approach but will focus, in particular, on Africa, Latin America and India

PO4067 Studies in Political Thought (Spring/4)

3 hours per week; 13 weeks/7th semester; 26L/13T; ECTS credits:6

The relationship between political action and political philosophy, with particular reference to questions of freedom and virtue, explored through the thought of Plato, Machiavelli, Kant, Marcuse and Foucault; the political thought of Plato as a foundation for Western philosophy; the politics of Machiavelli and his influence on the development of humanism and republicanism; the ethical liberalism of Kant; Herbert Marcuse, critical theory, and the radical critique of modern life; Michel Foucault and the relationship between truth and power.

SO4032 Introduction to Sociology 2 2-1-0 (Spring/1)

3 hours per week; 13 weeks/4th semester; 26L/13T; ECTS credits:6

European families; social mobility in Europe; unemployment; EC responses to poverty; ethnicity and racism; gender inequality; European youth and popular cultures.

SO4016 Issues in Contemporary Irish Society* (Spring/3)

3 hours per week; 13 weeks/6th semester; 26L/13T; ECTS credits:6

Power, control and legitimacy in Irish Society; social differentiation, exclusion and marginalisation; social control and social conflict; ideology-dominant and submerged discourses; the nature and reality of consent and resistance.

SO4023 Sociological Theory (Spring/2)

3 hours per week; 13 weeks/3rd semester; 26L/13T; ECTS credits:6

The analysis of power and stratification, functionalist, marxist and feminist theories; ideology, meaning and social action, Weberian, Marxist, rational choice and symbolic interactionist perspectives; macro and micro theories of social change; bridging the chasm between structure and process, Parsons, Habermas and Giddens;

fragmentation or fusion; the post modernist debate; the limits of sociology, space and time in sociological theory.

SO4025 Quantitative Research Methods (Spring/3)

4 hours per week; 13 weeks/5th semester; 26L/26Lab; ECTS credits:6

Formulating a research question; key concepts; use of relevant literature; formulating practicable hypotheses; designing an interview schedule or questionnaire; selecting a sample and fieldwork; preparation of data for computer analysis; basic data analysis including frequencies, cross tabulation (with tests of significance and measures of association); understanding control variables and writing a research report.

SO4032 Introduction to Sociology 2 (Spring/1)

SO4032, 'Introduction to Sociology 2' 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 student's 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. Topics include sociological approaches to deviance, crime and control; migration, recent trends in Irish migration and issues faced by contemporary migrants; concepts of ethnicity and 'race'; contemporary issues in the representation of ethnic minorities in the media; religiosity and secularisation; civil and invisible religion; social class and contemporary debates regarding the continuing relevance of the concept of class.

SO4035 Sociology of Organisation (Spring/3)

3 hours per week; 13 weeks/6th semester; 26L/13T; ECTS credits:6

The growth and proliferation of organisations since the 19th century; organisations as a sociological research object; the relationship between sociological theory and organisational management; the potential transitions from modern to post-modern organisations; new developments in organisational theory and research, such as networking, information technology, teleworking and organisational culture as well as enduring inequalities in organisations.

SO4038 Technology, Social Innovation and Gender (Spring/4)

3 hours per week; 13 weeks/8th semester; 39L/; ECTS credits:6

This module explores the different conceptual frameworks surrounding the debate on the role(s) of technology in society and the impact of society on technological development from a gender perspective. It explores the extent to which technology 'liberates' or 'imprisons' women; the ways in which technology can be defined, whether technology is neutral or value free. Specific topics will include health care and reproduction technologies, women's participation and exclusion from technology, technology and the home, and women's marginalized position in the technological sphere. There will be a strong focus on information technologies as one of the major technologies affecting everyday life and work today.

SO4078 Inequality and Social Exclusion (Spring/4)

3 hours per week; 13 weeks/8th semester; 26L/13T; ECTS credits:6

Defining inequality, social exclusion; an examination of different approaches to measuring inequality and social exclusion and the implications of the diversity; locating the issues of inequality and social exclusion within discourses such as citizenship and equality, an analysis of class, gender and racial divisions exploring their continued significance as bases for both social exclusion and inequality.

SP4002 Introduction to Latin American Culture/s (Spring/1)

3 hours per week;13 weeks/2nd semester;13L/26T;ECTS credits:6

This module offers an introduction to the most important events and movements in Latin American culture. It focuses mainly on the cultural impact of the Spanish colonisation, the New Republics, and the development and revision of women's place in Latin American culture. Through the use of literature, music, film and other forms of culture, the module will serve as a platform for the exploration of up-to-date socio-political issues in Latin America and their effect on cultural production.

SP4132   Spanish 2 (European Studies) Beg* 2-1-0 (Spring/1)

3 hours per week; 13 weeks/2nd semester; 26L/13T; ECTS credits:6

A brief revision and transfer of known structures to new communicative contexts; development of all four language skills and basic translation strategies in the classroom and laboratories; selective reading of short stories. (General lecture: 1 hour)comprising an introduction to Latin America in the twentieth century with lectures on recent history, film , popular culture and literature

SP4142 Spanish A2 (European Studies)* (Spring/1)

3 hours per week; 13 weeks/2nd semester; 26L/13T; ECTS credits:6

General lecture of one hour a week comprising an introduction to Latin America in the twentieth century with lectures on recent history, film, popular culture and literature. A contemporary novel by a Hispanic writer will be read and discussed in class. The course incorporates a brief revision and transfer of known structures to new communicative contexts; development of all four language skills and basic translation strategies in the classroom and laboratories; selective reading of short stories

SP4146 Modern and Contemporary Spain (Spring/3)

3 hours per week; 13 weeks/6th semester; 26L/13T; ECTS credits:6

Language work on more complex structures; text analysis and exposure to a variety of writing styles; oral discussion and presentations on texts relevant to the topics of the general lecture; post-civil war Spain political societal and economic developments transition to democracy the cultural and literary heritage.

SP4148 Media and Current Issues in the Spanish Speaking (Spring/4)

3 hours per week; 13 weeks/8th semester; 26L/13T; ECTS credits:6

Multi-media based extensive use of press and journal articles video material and films cd ROMs and Internet for language and information purposes; seminars on political economic and social issues in Spain and other Spanish speaking countries; national identity nationalisms welfare state terrorism racism and discrimination religion and today's society.

SP4232 Spanish for Beginners 2 *(Applied Languages) (Spring/1)

3 hours per week; 13 weeks/2nd semester; 26L/13T;ECTS credits:6

The language of persuasion; expressing opinions; making comparisons, showing agreement and disagreement; improvement of communicative ability in giving information concerning themselves, other people, and about places, timetables, events. (General lecture: 1 hour) Comprising an introduction to Latin America in the twentieth century with lectures on recent history, film, popular culture and literature.
Prerequisite SP4231 Spanish 1 Beginners (Applied Languages)

SP4242 Spanish 2A (Applied Languages)* (Spring/1)

3 hours per week; 13 weeks/2nd semester; 26L/13T; ECTS credits:6

Developments and reinforcement vocabulary pertaining to specific contexts by the use of monolingual and thesaurus dictionaries; emphasis on text structure and analysis of text styles. A contemporary novel by a Spanish writer will be read and discussed. (General lecture: 1 hour) Comprising an introduction to Latin America in the twentieth century with lectures on recent history, film, popular culture and literature. *Prerequisite SP4221*

SP4246 Spanish Language, Culture & Society 4 (Spring/3)

3 hours per week; 13 weeks/6th semester; 13L/26T/13Lab; ECTS credits:6

The theory and practice of translation concentrates on political and legal texts and summary writing is practised, the cultural and literary heritage of Post-Civil War Spain is examined, as are political, societal and economic developments of this period, including Spain's transition from dictatorship democracy.

SP4248 Spanish Language, Culture and Society 6 (Spring/4)

3 hours per week; 13 weeks/8th semester; 13L/26T/13Lab; ECTS credits:6

Advanced Spanish grammar is practiced and text analysis and production continued, students tackle legal translation, further deepen their knowledge of translation theory and practice consecutive interpreting, through debate and discussions, students perfect their spoken Spanish and prepare for the oral examination as well as gain an insight into current Hispanic controversial issues including nationalisms, the welfare state, terrorism, racism and discrimination and religion.

SP4622 Indigenismo and Negrismo in Latin American Literature (Spring/1)

3 hours per week; 13 weeks/2nd semester; 13L/26T; ECTS credits:6

This module approaches literary Americanism in Latin America through black and indigenous Hispanic texts that

are representative of literary trends in general. 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.

SP4625 From Romanticism To Realism in Hispanic Literature (Spring/3)

3 hours per week; 13 weeks/5th semester; 13L/26T/13Lab; ECTS credits:6

This module focuses on literary and artistic works in Spain and Latin America within the movements of Romanticism and Realism. One weekly lecture will focus on the socio-historical context of the xix century. Two tutorials will be devoted to study and analyse literary texts in detail.

TW4116 Technical Writing 2*(Spring/3)

4 hours per week; 13 weeks/6th semester; 26L/26T; ECTS credits:6

Forms of technical communication. Writing online documentation.
Hypertext and hypermedia. Interviewing skills for technical authors; ethical issues in technical communication; consumer protection law; health and safety legislation; intellectual property laws.
Prerequisite TW4115 Technical Writing 1

TW4118 Technical Writing 4* (Spring/4)

4 hours per week; 13 weeks/8th semester; 26L/26T; ECTS credits:6

Economics of text production (estimating, cost control, planning quality control); information design; desk-top publishing; image and text processing; conventional print.
Prerequisite TW 4116 Technical Writing 2

WS4011 Feminist Perspectives: An Introduction (Spring/1)

3 hours per week;13 weeks/2nd
semester;26L/13T;ECTS credits:6

The nature of women's studies; an introduction to the main theoretical frameworks (viz Liberal; Radical; Psychoanalysis; Marxist and socialist; Existentialist and post-modern); exploration of topics (paid work; motherhood; violence etc.) in the context of these frameworks; a critical evaluation of multifactorial frameworks and their relevance in understanding the position of women in Irish society.

WS4028 Theories of Multiculturalism

This module examines theoretical approaches to multiculturalism and how different multicultural approaches construct cultural difference in gendered ways; it offers a comparative approach by considering different gendered cultural practices and different national approaches to multiculturalism; it offers a framework for understanding how gender relations affect and are affected by multicultural strategies for negotiating difference.