Imperial College
London

Master's Course Requirements
2010/11

Master of Science (MSc)

Actuarial Finance
Advanced Chemical Engineering
Advanced Computing
Advanced Computational Methods for Aeronautics, Flow Management and Fluid Structure Interaction
Advanced Mechanical Engineering
Advanced Methods in Taxonomy and Biodiversity
Allergy
Analogue and Digital Integrated Circuit Design
Applied Mathematics
Applied Photonics
Bioinformatics and Theoretical Systems Biology
Biomedical Engineering
Cardio-Respiratory Nursing
Communications and Signal Processing
Composites: the Science, Technology and Engineering Application of Advanced Composites
Computing for Industry
Computing Science
Computing with Specialisation
Concrete Structures
Conservation and Forest Protection
Conservation Science
Control Systems
Crop Protection
Earthquake Engineering
Ecological Applications
Ecology, Evolution and Conservation
Engineering Geology for Ground Models
Engineering Geology for Ground Models and Business Management
Engineering Geology for Ground Models and Sustainable Development
Environmental Engineering
Environmental Technology
Finance
General Structural Engineering
History of Science, Medicine and Technology/ Science, Technology, Medicine and Society
Human Molecular Genetics
Hydrology and Water Resources Management
Immunology
Infection Management for Pharmacists
Innovation Design Engineering (joint MA/MSc with Royal College of Art)
Integrative Neuroscience
International Health Management
Management
Mathematics and Finance
Medical Ultrasound

Metals and Energy Finance
Modern Epidemiology
Molecular Biology and Pathology of Viruses
Molecular Medicine
Nuclear Engineering
Optics and Photonics
Petroleum Engineering
Petroleum Geophysics
Petroleum Geoscience
Physics
Plant Science and Biotechnology
Preventive Cardiology
Pure Mathematics
Quality and Safety in Health Care
Quantitative Biology
Quantum Fields and Fundamental Forces
Reproductive and Developmental Biology
Risk Management and Financial Engineering
Science Communication
Science Media Production
Scientific, Technical and Medical Translation with Translation Technology
Shock Physics
Soil Mechanics
Soil Mechanics and Business Management
Soil Mechanics and Engineering Seismology
Soil Mechanics and Environmental Geotechnics
Soil Mechanics and Sustainable Development
Structural Steel Design
Surgical Science
Surgical Technology
Sustainable Energy Futures
Theory and Simulation of Materials
Transport

Master of Research (MRes)
Advanced Computing
Biochemical Research
Bioimaging Sciences
Biomedical Physical Chemistry
Biomedical Research
Biosystematics
Cancer Biology
Chemical Biology of Health and Disease
Clinical Research
Controlled Quantum Dynamics
Ecology, Evolution and Conservation Research

Entomology
Experimental Neuroscience
Experimental Physiology and Drug Discovery
Green Chemistry: Energy and the Environment
Integrated Crop Pest and Disease Management
Integrative Biomedical Sciences
Molecular and Cellular Basis of Infection
Molecular Plant Biology and Biotechnology
Molecular Science and Engineering of Interfaces
Nanomaterials
Photonics
Plastic Electronic Materials
Structural Molecular Biology
Synthesis in Medicine
Systems and Synthetic Biology

Master of Business Administration (MBA)

Master of Education (MEd)
Surgical Education
University Learning and Teaching

Master in Public Health (MPH)

Certificate of Advanced Study (CAS)
Allergy
Industrial Pharmaceutical Chemistry
Learning and Teaching
Perioperative Specialist Practitioners
Preventive Cardiology
Surgical Care Practitioners

Master of Science (MSc)

Actuarial Finance

Additional Entry Requirements

Applicants must be literate in modern finance and will ideally have one or two years' work experience as an actuarial trainee. They must also have:

A good degree (normally equivalent of a UK Upper Second Class Honours Degree or equivalent) ideally in mathematics, statistics, mathematical economics or finance, engineering, or a natural science subject, and must normally have attempted, passed or have exemption from at least four of the five Institute and Faculty of Actuaries examinations CT1, CT3, CT4 and CT5.

Curriculum

(a) *Compulsory Courses*
Actuarial Practice
Quantitative Methods
Corporate Finance
Business Economics
Investments
Enterprise Risk Management
Derivatives
Advanced Enterprise Risk Management

(b) *Summer Courses*
Accounting (e-learning)
Business Communications

(c) *Two of the following field options*
Advanced Finance
General Insurance
Life Insurance
Pensions

(d) *Two of the following summer options*
Healthcare
Personnel Economics
Further ERM Topics
(Further options may be introduced later; not all will necessarily be offered each year.)

(e) Students will also undertake one of the following:
An individual research project on an approved topic
A Financial Management Project and an extra summer option.

Duration of Course of Study

Part-time: Two calendar years

Examination

Assessment of all courses will be based on a combination of examinations and coursework with the exception of the accounting course, which is assessed by examination alone, and the business communications course, which is assessed by coursework alone. Examinations for each of the compulsory courses will be of three hours' duration.

Each field option will have two three-hour examinations (one for each sub-module) and each summer option will have a two-hour examination.

In addition, assessment of project report/Financial Management Project and an oral examination at the Examiners' discretion.

Dates of Examination

Written papers	December, March and July in year one, and, October, January, April and July in year two. (NB in academic year 2010/11 both year one and year two students will have exams in December, March and July)
Coursework	Continuous assessment
Project Report	September of year two

A student who has failed one or more of the written examinations may apply to the course director to be permitted to take their one permitted re-sit within the same academic year.

Advanced Chemical Engineering

Additional Entry Requirements

Normally an Upper Second Class Honours degree in Chemical Engineering. Candidates with degrees in other branches of engineering or the physical sciences and appropriate experience may also be considered.

Curriculum

Students follow one of the streams listed below:-
Advanced Chemical Engineering
Advanced Chemical Engineering with Biotechnology
Advanced Chemical Engineering with Process Systems Engineering
Advanced Chemical Engineering with Structured Product Engineering

Candidates must complete ten taught technical modules from lists of general, management and specialised courses and these may include a coursework component.

General Modules
Typical modules include:
Advanced Reaction Engineering (counts as two modules)
Energy, Fuels, Combustion and Pollution
Environmental Engineering
Fluids Engineering
Introduction to Nuclear Technology
Modelling of Thermophysical Properties of Fluids
Process Heat Transfer
Safety Engineering (counts as two modules)
Strategy of Process Design

Up to two of the ten modules can be taken from the following management modules list:-

Management Modules
Typical modules include:
Behaviour in Industrial Organisations
Business Strategy
Information Management
International Business
Introduction to Operational Research
Finance and Financial Management
Marketing
Project Management
The National Economy

Students on the specialised streams must take four of their modules from a list of specialised courses (only a subset of these modules will be offered each year):-

Specialised Modules

Typical modules are listed below:
Biotechnology
Biological Water Treatment
Biomechanics
Biomodelling
Cell Biology and Physiology
Fundamentals of Biotechnology
Mammalian Cell Biotechnology
Physical Treatment of Wastewater
Separations in Biotechnology
Process Systems Engineering
Advanced Process Control
Advanced Process Synthesis
Control of Uncertain Systems
Dynamic Behaviour of Process Systems
Flexible Plant Operation
Nonlinear and Mixed-Integer Optimisation
Procedural Control
Supply Chain Management
Structured Product Engineering
Chemistry and Engineering of Polymers
Introduction to Colloid and Interface Science
Flexible Plant Operation
Fluid and Particle Mechanics
Formulation Engineering

Students will also undertake an individual research project on an approved topic and will submit a report thereon. Students will start working on their research project in the first month of the course. Where students have chosen a specialisation the research project must be relevant to that area of specialisation.

Students will be required to attend a series of professional skills workshops to enhance the development of their general research, personal and transferable skills.

Duration of Course of Study

Full-time: One calendar year

Examination

Each taught module will normally be examined by a one-and-a-half-hour written paper (where relevant part or all of a module may be assessed by means of a project which could be completed in teams); two modules may be combined in a three-hour written paper.

The research project is assessed through a literature review, an oral presentation and a dissertation.

To be awarded the MSc degree, students must pass the taught module *and* the research project component, and must attend all professional skills workshops, unless otherwise agreed with the MSc coordinator.

Dates of Examination

Written papers	January, May and June
Literature Review	January/February
Oral Presentation	July
Dissertation	Late September

Depending on the options chosen students will graduate with the MSc in Advanced Chemical Engineering or the MSc in Advanced Chemical Engineering with Biotechnology or the MSc in Advanced Chemical Engineering with Process Systems Engineering or the MSc in Advanced Chemical Engineering with Structured Product Engineering.

Advanced Computing

Additional Entry Requirements

Normally a First Class Honours degree in Computer Science or in Mathematics with a substantial computing element.

Curriculum

The course consists of taught lecture and practical modules in the autumn and spring terms, and a substantial individual project undertaken in the period from May to September. The project is expected to contain some element of original work. The project may involve a period of up to three months spent outside the College, during which regular contact would be maintained with the project supervisor.

The course comprises nine modules, including at least seven taught options and one practical option. The ninth module may be either a taught option or a second practical option or an Individual Study Option (ISO). The project includes a literature survey in the Spring term.

The taught options cover a range of options organised within *six* main areas of specialisation:

Logic and artificial intelligence
High performance computing
Mathematical computing
Parallel and distributed systems
Software engineering
Computational management

A list of the available taught options and their pre-requisites will be published by the Department from time to time.

Duration of Course of Study

Full-time: One calendar year

Examination

Unseen written papers totalling at least six hours but not exceeding 16 hours.
Assignments and open book examinations where appropriate.
Assessment of coursework.
A dissertation on the individual project.
An oral examination at the examiners' discretion.

Dates of Examination

Written papers	April/May
Report	Submitted by 25 September

Advanced Computational Methods for Aeronautics, Flow Management and Fluid Structure Interaction

Additional Entry Requirements

Normally at least an Upper Second Honours degree in Mathematics, Physics, Aeronautical Engineering or Mechanical Engineering. Applications from graduates in Civil or Chemical Engineering may also be considered.

Curriculum

Students must pass 12 units from the following modules: fundamental of fluid mechanics (2 units); experimental fluid dynamics (2 units); finite difference methods (2 units); finite element methods (1 unit); linear algebra (2 units); Navier-Stokes equations and turbulence modelling (2 units); computational methods for compressible flow (2 units); hydrodynamic stability (1 unit); structural dynamics (2 units); separated flows (1 unit); aeroelasticity (1 unit); control theory (1 unit); technology of sensors and actuators (3 units).

In addition, students will undertake an individual project over approximately 5 months and write a report of 12,000 to 15,000 words thereon.

Duration of Course of Study

Full-time:	One calendar year
Part-time:	Two calendar years

Examination

Written papers: one hour per 1-unit module; two hours per 2-unit module; three hours per 3-unit module.
Report on research project.
Oral examination at the discretion of the examiners.

For students following the course part-time the written examinations will be divided between the first and final years in accordance with modules completed. Students will normally submit their project report in the final year of study.

Dates of Examination

Written examinations	Early in the Spring term for modules delivered in the Autumn term Early in the Summer term for modules delivered in the Spring term
Report on research project	23 September
Oral examination (if required)	September

Advanced Mechanical Engineering

Additional Entry Requirements

A degree in science or engineering. Industrial experience, while not essential, would be an advantage.

Curriculum

The course will include examined taught courses in subjects which will be grouped primarily according to subject. The groups from which subjects will be chosen are as follows:

(a) Dynamics
(b) Materials and stress analysis
(c) Thermodynamics and fluid mechanics
(d) Ungrouped subjects
(e) Management

The particular subjects within each group and contact hours for each subject will be decided from time to time by the Department. Each subject will comprise either 20 or 40 nominal contact hours. Students will be required to achieve a satisfactory standard in taught courses of at least 140 nominal contact hours in total. No more than one management subject may be chosen.

Students will also be required to undertake an individual project and submit a report thereon, which shall not normally exceed 50,000 words in length. This, subject to the approval of the course tutor, may involve a period of up to three months spent outside the College, during which time regular contact will be maintained with the course tutor. Each student will present two seminars on the project during the summer. Students following the course part-time will present their seminars and project reports at the end of their period of study.

Duration of Course of Study

Full-time:	One calendar year
Part-time:	Two or three calendar years

Examination

Unseen written papers totalling at least six hours but not exceeding 12 hours.
Assignments and open book examinations where appropriate.
Assessment of coursework.
Report on the project.
An oral examination at the discretion of the examiners.

Students following the course part-time must take the examinations in the subjects they have studied that year, and will normally submit their dissertation in the final year of study.

Dates of Examination

Written papers	Spring term
Project report	By 25 September

Advanced Methods in Taxonomy and Biodiversity

Additional Entry Requirements

Normally a degree of at least an Upper Second Class Honours which should preferably be in a biological subject (including agriculture and horticulture).

Curriculum

The course will be offered at Imperial College in collaboration with the Natural History Museum where the majority of the teaching will take place. Lecture courses are organised mainly in modules and cover the following subject areas:

Principals of taxonomy; introduction to computing; key construction and identification; phylogeny reconstruction; molecular systematics; relating phylogeny to coevolution and biogeography; collections management; palaeontology and stratigraphy; phonetic techniques in taxonomy; biodiversity assessment and underlying theory.

Students will also attend research seminars, undertake coursework and follow a field course in sampling and identification exercises.

In addition, all students will undertake an individual project and write a report thereon. The report will not normally exceed 15,000 words in length. The project may involve a period of up to four months spent outside the College during which contact will be maintained with the course tutor. All students will attend an oral examination on the project.

Duration of Course of Study

Full-time: One calendar year

Examination

Two three-hour written papers covering core course subjects.
Two oral presentations and two written reports on the coursework.
Project report and oral examination.

Dates of Examination

Written papers	May
Coursework essays and oral presentations	December and April
Project report	Early September
Oral examination	September

Allergy

Additional Entry Requirements

Normally a degree in Medicine or Dentistry or at least an Upper Second Class Honours in a healthcare related subject, typically Nursing, Dietetics, Immunology/Physiology or Biomedical Science.

AND

Normally three years' experience in a healthcare field.

Curriculum

Students will study three compulsory taught modules covering the following areas: the scientific basis of allergy; diagnosis and treatment of allergic disease; and the cutting edge of allergy. All students will undertake a research methods module, followed by an individual research project or systematic review which will be written up in the form of a dissertation. Projects can either be carried out at Imperial or at the student's own institution provided appropriate supervision can be established. All students undertake four optional taught modules selected from options in the following areas: allergic airways disease; rhinitis and hayfever; allergic skin disease; allergic gastrointestinal disease; food hypersensitivity; and paediatric allergy. The modules cover both scientific theory and practical clinical aspects of allergic disease. Candidates will attend lectures and clinics, and will be expected to undertake self-directed learning and complete assignments throughout the course via the Web.

Duration of Course of Study

Part-time: Two or three calendar years

Examination

Taught modules will be assessed by a combination of essays and reports, written or oral assignments, case presentations, and written and practical examinations. Candidates will also be required to maintain an electronic learning portfolio including a reflective log of their clinical activities and skills. In addition, students will write a dissertation of no more that 10,000 words, and undergo oral examination.

Dates of Examination

The scientific basis of allergy (Module 1)	December, Year 1
Diagnosis and treatment of allergic disease (Module 2)	March, Year 1
The cutting edge of allergy (Module 3)	June, Year 1
Optional modules	Individual assessment on completion of the module in Year 2
Dissertation and oral	By 15 September in the final year of study

Analogue and Digital Integrated Circuit Design

Additional Entry Requirements

Normally at least a good Upper Second Class Honours degree, or equivalent, in Engineering, Physics, Mathematics or another relevant subject.

Curriculum

Students are assessed on eight modules chosen from the examinable modules provided that at least four of the eight are core modules. Additional courses may be followed on a 'not-for-credit basis' at the discretion of the Course Organiser. The list of examinable modules is updated and published each year.

Students also undertake coursework and laboratory work associated with their studies.

Students also undertake an individual project occupying three months part-time (January to March) and four months full-time (June to September). A project may be undertaken as an intern within a company or other university, provided the topic is suitable, but only with the agreement of the Course Organiser. A student doing such a project may spend up to five months away from the College placed at the external organisation during the project period.

Duration of course of study

Full-time: One calendar year

Examination

Each of the eight examinable modules is assessed by written examination. Students will also undertake assessed laboratory work and an individual project that will be assessed through the means of a dissertation and an assessed oral presentation.

Dates of Examination

Written exams	Start of Summer term
Assessed laboratory work	Autumn and Spring terms
Project dissertation	by September

Applied Mathematics

Additional Entry Requirements

A first degree, normally of at least Upper Second Class Honours in Mathematics or Physics.

Curriculum

Students will follow eight courses of which at least three must be chosen from core courses in the area of continuum mechanics, nonlinear dynamics and numerical analysis/advanced mathematical methods. The other five courses will comprise option courses in the same areas or in related subjects. No more than three courses, which must be from final year level, may be chosen from the curriculum for the MSci course.

With the permission of the course organiser and subject to timetabling constraints a student may select some option courses from an approved list of subjects offered by King's College London, Queen Mary University of London and the Taught Course Centre in Mathematical Sciences (TCC).

Each student will also carry out an individual research project and submit a report of 10,000 words thereon.

Duration of Course of Study

Full-time:	One calendar year
Part-time:	Two calendar years

Examination

Eight written papers totalling not less than 16 hours, coursework, a report on the project and an oral examination at the examiners' discretion. Students following the part-time course will take four written papers in the first year and four in the second year. Students wishing to take more than four courses in the first year may only do so with the approval of the Course Organiser.

Dates of Examination

Written papers	May
Coursework	Continuous assessment
Project report	By 23 September of the final year

Applied Photonics

Additional Entry Requirements

Normally at least an Upper Second Class Honours degree in Physics or a related discipline from a UK university [or overseas equivalent].

Curriculum

Students attending Imperial College in Year 1 choose three of the foundation courses, four of the advanced course options and follow a language course to help support their second year of study in continental Europe. In addition, in Year 1 they undertake three modules of laboratory training. Students attending Imperial College in Year 2 follow two of the foundation courses (the choice depending on the previous year's programme of study), three advanced option courses and a laboratory familiarisation course. In Year 2 students must undertake a major research project on which they must submit a dissertation. Each year of study also includes business/entrepreneurship courses.

Foundation courses

Imaging
Lasers
Optical Communications Physics
Optical Measurement and Devices

Advanced course options (two marked are double modules)*

Nonlinear Optics
Opto-electronic Components and Devices
Fibre Optics
Photonic Structures
Optical Displays
Laser Technology
Biomedical Optics
Laser Optics
Quantum Optics
Optical Design*
Optical Design Laboratory*

Duration of Course of Study

Full-time: Two academic years with one of the academic years spent at Imperial College and the other spent at one of the Erasmus Mundus Master in Optics in Science and Technology partner institutions.

Examination

Each Foundation subject is examined by a one hour written paper.

Each optional subject will be examined by a half-hour written paper.
The language course is examined by continuous assessment, oral exam, and written paper.
Laboratory work is assessed by students' records of their laboratory work, and laboratory reports throughout the year.
A project dissertation for Year 2 students.

Examinations at the partner institution follow the local rules and regulations of that institution.

Dates of Examination

Written papers *Foundation courses*	January
Written papers *Advanced courses*	May/June
Project dissertation	To be submitted by the end of term 3

A student who has failed one or more of the written examinations may apply to the course director to be permitted to take their one permitted re-sit within the same academic year.

Bioinformatics and Theoretical Systems Biology

Additional Entry Requirements

A first degree in a biomedical or computing/mathematics subject. All students will be required to be confident in basic computer operations and to have a solid knowledge of mathematical and statistical methods underlying bioinformatics and theoretical systems biology.

Curriculum

Students will follow a core curriculum including courses in the areas of bioinformatics, systems biology, mathematics and statistics and computing. In addition, students will complete three research projects (10-12 weeks) and will submit a report on each, followed by a presentation or *viva voce* examination.

Duration of Course of Study

Full-time: One calendar year

Examination

Written and practical examination, computer-based assessment, coursework, written report on two research projects and web based assessment of the third project, presentation or *viva voce* following each research project and an oral examination examining all aspects of the course.

Dates of Examination

Written paper and practicals	January
Computer-based assessment	January
Computer-based assessment (practicals)	Continuous assessment
Coursework	Continuous assessment
Report and presentation or *viva voce*	March, June and September
Oral examination	September

Biomedical Engineering

Additional Entry Requirements

Engineering track (Medical Physics, Biomechanics, Biomaterials and Neurotechnology streams): A degree in engineering, physics, computer science or a cognate subject. Some training in biology would be an advantage. For the Biomechanics stream, introductory knowledge of solid, fluid and continuum mechanics is also required.

Medical track *(currently suspended)*: A degree in medicine, physiology or a cognate subject. Some training in mathematics and/or physics would be an advantage. The medical track is currently suspended until further notice.

Curriculum

(a) Engineering and medical track students follow some separate lecture courses in terms 1 and 2 and common courses throughout the year as follows:

Term 1
Engineering track (Medical Physics stream)
Statistics and Data Analysis *(compulsory)*
Biomedical Imaging *(compulsory)*
Systems Physiology *(compulsory)*
Physiological Monitoring *(compulsory)*
Computational Neuroscience *(optional)*
Biomechanics *(optional)*
Biomaterials *(optional)*
Health & Safety and Regulatory Requirements for Medical Devices *(compulsory)*
Journal Club *(compulsory)*

Engineering track (Biomechanics stream)
Statistics and Data Analysis *(compulsory)*
Biomedical Imaging *(compulsory)*
Systems Physiology *(compulsory)*
Biomechanics *(compulsory)*
Biomaterials *(optional)*
Health & Safety and Regulatory Requirements for Medical Devices *(compulsory)*
Journal Club *(compulsory)*

Engineering track (Biomaterials stream)
Statistics and Data Analysis *(compulsory)*
Biomedical Imaging *(compulsory)*
Systems Physiology *(compulsory)*
Biomaterials *(compulsory)*
Biomechanics *(optional)*
Health & Safety and Regulatory Requirements for Medical Devices *(compulsory)*

Journal Club *(compulsory)*

Engineering track (Neurotechnology stream)
Statistics and Data Analysis *(compulsory)*
Biomedical Imaging *(compulsory)*
Systems Physiology *(compulsory)*
Computational Neuroscience *(compulsory)*
Health & Safety and Regulatory Requirements for Medical Devices *(compulsory)*
Journal Club *(compulsory)*

Medical track (currently suspended)
Mathematics *(compulsory)*
Introductory Mechanics *(compulsory)*
Electronics and instrumentation *(compulsory)*
Computer principles *(compulsory)*
Biomedical Imaging *(compulsory)*

Term 2
Engineering track Medical Physics stream (students choose 4 out of the following 8 options over the two terms)
Biomechanics *(optional – in term 1)*
Biomaterials *(optional - in term 1)*
Computational Neuroscience *(optional - in term 1)*
Advanced medical imaging *(optional)*
Radiotherapy and radiobiology *(optional)*
Nuclear medicine *(optional)*
Image processing *(optional)*
Health economics and decision making in healthcare industries *(optional)*

Engineering track Biomechanics stream (students choose 4 out of the 6 options over the two terms):
Cellular biomechanics *(optional)*
Neuromuscular control *(optional)*
Orthopaedic Biomechanics *(optional)*
Microsystems & nanotechnology *(optional)*
Biomaterials *(optional - in term 1)*
Health economics and decision making in healthcare industries *(optional)*

Engineering track Biomaterials (There are 3 compulsory modules and students choose 1 out of 4 optional stream modules over the two terms)
Advanced Biomaterials *(compulsory)*
Tissue Engineering *(compulsory)*
Orthopaedic Biomechanics *(compulsory)*
Advanced medical imaging *(optional)*
Image processing *(optional)*
Biomechanics *(optional- in term 1)*

Engineering track Neurotechnology (There is 1 compulsory module and students choose 3 out of 6 optional stream modules this term)
Brain Machine Interfaces *(compulsory)*
Neuromuscular control *(optional)*
Advanced medical imaging *(optional)*
Image processing *(optional)*
Microsystems & nanotechnology *(optional)*
Advanced biological modelling *(optional)*

Medical track (currently suspended) (students choose 4 out of the following 10 courses)
Computer programming *(compulsory)*
Introductory signal processing *(compulsory)*
Image processing *(optional)*
Biomechanics *(optional)*
Advanced imaging *(optional)*
Radiotherapy and radiobiology *(optional)*
Nuclear medicine *(optional)*
Biomaterials & Tissue Engineering *(optional)*
Orthopaedic Biomechanics *(optional)*
Computational neuroscience *(optional)*

Term 3
Engineering track stream (Medical Physics, Biomechanics, Neurotechnology stream)
Design-Led Innovation (compulsory)

Engineering track (Neurotechnology stream)
Sensory neural coding laboratory *(compulsory)*

(b) Seminars/Journal Clubs, Study groups, tutorials, laboratory sessions, library projects, computing assignments.
(c) Site visits.
(d) Submission of a report on an individual research project.

The project may, subject to the course director's approval, involve a period of up to three months' study outside the College, during which regular contact would be maintained with the supervisor.

Duration of Course of Study

Full-time:	12 months
Part-time:	24 months

Examination

One written paper for each module, an oral presentation and an essay for the seminars/journal clubs, a library project, a report on the project, and an oral examination at the examiners' discretion.

Dates of Examination

	Full-time	*Part-time*
Written papers:	January and June	January and June
Project report:	By 25 September	By 25 September of final year

Cardio-Respiratory Nursing

Additional Entry Requirements

A professional nursing registration, either the RGN (Registered General Nurse) or the RSCN (Registered Sick Children's Nurse), and at least 12 months' experience in cardio-respiratory nursing.

Curriculum

Core course subjects of study will include qualitative and quantitative research, specialist areas in cardio-respiratory care, evidence-based health care and practice development.

Students will follow three optional courses chosen from the following fields: Clinical examination; heart failure; managing the care of individuals with cystic fibrosis; lung failure; thoracic nursing; smoking cessation programmes; health behaviours and psychology; and advanced life support.

In addition, all students will undertake an individual project and write a dissertation. The report will not normally exceed 12,000 words in length. All students will attend an oral examination on the project.

Duration of Course of Study

Part-time: Two calendar years

Examination

Written and practical examinations, coursework, dissertation and oral examination

Dates of Examination

Unseen written paper	June of first year
Pre-disclosed written paper	June of second year
Coursework	Continuous assessment
Project Report	September of the final year
Oral examination	September of the final year

Communications and Signal Processing

Additional Entry Requirements

Normally at least a good Upper Second Class Honours degree or equivalent in Engineering, Physics, Mathematics or another relevant subject.

Curriculum

Students are assessed on eight modules chosen from the examinable modules, provided that at least four of the eight are core modules. Additional courses may be followed on a 'not-for-credit basis' at the discretion of the Course Organiser. The list of examinable modules is updated and published each year.

Students also undertake coursework and laboratory work associated with their studies.

Students also undertake an individual project occupying three months part-time (January to March) and four months full-time (June to September). A project may be undertaken as an intern within a company or other university provided the topic is suitable but only with the agreement of the Course Organiser. A student doing such a project may spend up to five months away from the College placed at the external organisation during the project period.

Duration of course of study

Full-time: One calendar year.

Examination

Each of the eight examinable modules is assessed by written examination. Students will also undertake assessed laboratory work and an individual project that will be assessed through the means of a dissertation and an assessed oral presentation.

Dates of Examination

Written exams:	Start of Summer term
Assessed laboratory work:	Autumn and Spring terms
Project dissertation:	by September

Composites: the Science, Technology and Engineering Application of Advanced Composites

Additional Entry Requirements

A degree in Engineering, Metallurgy, Materials Science, Physics or Chemistry.

Curriculum

1 Production and properties of fibres and composites
2 Selection of composite systems
3 Analytical techniques and physical properties
4 Engineering properties and design
5 Design study/essay
6 Laboratory programme

Students are required to attend all courses, which include a laboratory programme and preparation of a design study/essay (assessed by written report and oral presentation); in the latter part of the course, students will undertake a research project and submit a report thereon and give an oral presentation. The project may, subject to the agreement of the course director, involve a period of up to three months spent outside the College, during which regular contact will be maintained with the project supervisor. Students following the course part-time are expected to undertake the bulk of their project in industry.

Duration of Course of Study

Full-time:	One calendar year
Part-time:	Two calendar years

Examination

Four three-hour written papers, assessment of coursework (including laboratory reports and report on design study and essay), report on project and oral presentation. Students studying part-time over two calendar years will sit two written papers in the first year with the remaining papers in the second and final year; coursework will be submitted in both years as directed; the report on the project will be submitted in the second and final year.

Dates of Examination

Written papers	Beginning of Summer term
Design study and essay	End of Spring term
Report on project	By 25 September
Oral presentation	Early September

Computing for Industry

Additional Entry Requirements

Current employment in a professional computing position. At the discretion of the Departmental Admissions Committee, candidates may be required to follow specific courses as a condition of acceptance.

Curriculum

Students will follow eight modules in the areas of artificial intelligence, programming, databases, software engineering, knowledge management, algorithms and multi-agent systems among others. A list will be published by the Department from time to time. Selection of modules will be agreed with the course director in order to ensure a coherent study programme.

Each student will also carry out an individual project, normally after completing at least six modules, and submit a report thereon within two years of commencement of the project.

Duration of Course of Study

Part-time: Two to four calendar years

Examination

Written papers totalling not less than 16 hours, assessment of coursework, a report on the project and an oral examination at the examiners' discretion.

Dates of Examination

Written papers	Normally April/May
Coursework	Continuous assessment
Project report	Normally by 23 September of the final year
Oral examination	September

Computing Science

Additional Entry Requirements

Normally an Upper Second Class Honours degree in Engineering, Mathematics or Physics. Some experience in programming is expected; students without a strong mathematical background or with a less relevant degree will be expected to have considerable industrial experience.

Curriculum

The course involves a series of lecture courses, coursework and laboratory work during the Autumn and Spring terms. Each student is assigned an individual project to which he/she will be expected to devote his/her time during May to September. Each student must also participate in a group project during the Spring term. The lecture courses will be as follows:

(i) A compulsory two-week introduction to programming
(ii) Compulsory courses introducing essential concepts
(iii) Options (five to be taken)

Autumn term compulsory courses
Computer systems and architecture
Operating systems concepts
Programming and programme design
Integrated laboratory
Introduction to formal logic and declarative programming

Spring term option courses which may vary from year to year (five to be selected)
A list of the available options and their pre-requisites will be published by the Department from time to time.

Duration of Course of Study

Full-time: One calendar year

Examination

Unseen written papers totalling at least 12 hours but not exceeding 16 hours.
Assignments and open book examinations where appropriate.
Assessment of coursework.
A dissertation on the individual project.
An oral examination at the examiners' discretion.

Dates of Examination

Written papers	April/May
Project	Submitted by 25 September

Computing with Specialisation

Additional Entry Requirements

Normally an Upper Second Class Honours degree in Computer Science or a course with a substantial computing element, Information Technology or Mathematics. Candidates with a degree in other disciplines coupled with substantial relevant industrial or other experience may also be considered.

Curriculum

The course consists of taught lecture and practical modules in the Autumn and Spring terms, and a substantial individual project in the specialist area undertaken in the period from May to September. The project may involve a period of up to three months spent outside the College, during which regular contact would be maintained with the project supervisor.

Students will follow one of the following specialisations:

Theory
Artificial Intelligence
Computational Management Science
Creative Industries
Visual Information Processing
Architecture
Distributed Systems
Software Engineering
Biomedical Applications
Performance Modelling

The Department may add or delete specialisations from this list from time to time.

The course comprises nine modules, including seven options or required modules from an appropriate list for the specialisation and two options selected freely from those offered. One of the seven options may be substituted by an Individual Study Option (ISO) in the specialist area. The project includes a literature survey in the Spring term.

A list of the available options and required courses for each specialisation and their pre-requisites will be published by the Department from time to time.

Duration of Course of Study

Full-time: One calendar year

Examination

Unseen written papers totalling at least six hours but not exceeding 18 hours.
Assignments and open book examinations where appropriate.

Assessment of coursework.
A dissertation on the individual project.
An oral examination at the examiners' discretion.

Dates of Examination

Written papers	April/May
Report	Submitted by 25 September

Depending upon which option courses are chosen, candidates will be awarded one of the following:

MSc in Computing (Theory)
MSc in Computing (Artificial Intelligence)
MSc in Computing (Computational Management Science)
MSc in Computing (Creative Industries)
MSc in Computing (Visual Information Processing)
MSc in Computing (Architecture)
MSc in Computing (Distributed Systems)
MSc in Computing (Software Engineering)
MSc in Computing (Biomedical Applications)
MSc in Computing (Performance Modelling)

Concrete Structures

Additional Entry Requirements

Normally at least an Upper Second Class Honours degree in Civil or Structural Engineering. Candidates with degrees in other branches of engineering or the physical sciences and appropriate experience may also be considered.

Curriculum

Candidates must undertake six modules in each of the Autumn and Spring terms: Business Management and Sustainable Development count as two modules in each term.

The following compulsory modules will be taken:

Autumn Term
Reinforced Concrete I
Prestressed Concrete
Finite Element Analysis
Structural Analysis

Spring Term
Concrete Materials
Reinforced Concrete II
Design and Construction

The following elective modules will be taken:

Autumn Term
Structural Dynamics
Business Management I or Sustainable Development I

Spring Term
Durability of Concrete Structures
Time and Temperature Behaviour of Concrete Structures
Seismic design of concrete structures
Structural Reliability Theory
Non linear structural analysis*
Design of Bridges
Business Management II or Sustainable Development II

* Not with Business Management or Sustainable Development

Students will also undertake an individual research or design related investigative project on an approved topic and will submit a report thereon.

Part-time Students

Attendance of Autumn term in year one and Spring term in year two. The individual research or design related investigative project is undertaken, under regular guidance from a College supervisor, by private study or by arrangement at their place of employment.

Duration of Course of Study

Full-time:	One calendar year
Part-time:	Two calendar years

Examination

15-24 hours of written papers (including some MCQs).
Assessment of coursework including design projects.
Individual research or design related investigative project.
Oral examination at the discretion of the examiners.

Dates of Examination

Written paper	January and April/May
Individual research or design project	By 1 September
Oral	September

Depending on the options chosen students will graduate with the MSc in Concrete Structures or the MSc in Concrete Structures and Business Management or the MSc in Concrete Structures and Sustainable Development.

Conservation and Forest Protection

Additional Entry Requirements

Normally a degree in science, engineering or agriculture.

Curriculum

Candidates will study the following modules:
1. Introduction to ecology and species identification
2. Insect and mite systematics
3. Anthropogenic damage, forest pathology and forest pests
4. Conservation in action
5. Population ecology – demography and management
6. Biological and chemical control methods
7. Decision tools
8. Soils, sites and nutrition
9. Experimental design and statistical computing
10. Forest ecology, management and conservation
11. Synthesis and review

Students will also undertake a research project and submit a report thereon, which shall not normally exceed 10,000 words in length. Normally this will be at Silwood Park, but in special circumstances research may be at an outside institute.

Duration of Course of Study

Full-time:	One calendar year
Part-time:	Three calendar years

Examination

Three three-hour papers, a project report, assessment of coursework and oral examination at the discretion of the examiners.

Students following the part-time course enter the examination in two parts. In the second year they enter the written papers and are assessed on coursework. At the end of the third year the project report is examined.

Dates of Examination

Written papers	One in January, two in April/May
Project reports	By 14 September

Conservation Science

Additional Entry Requirements

Normally an Upper Second Class honours degree, or better, in an appropriate subject.

Curriculum

The course is delivered in conjunction with the Institute of Zoology of the Zoological Society of London, the Durrell Wildlife Conservation Trust and the Royal Botanic Gardens, and consists of 20 weeks of taught material followed by a 23 week research project. The taught component course has four themes - a framework for analysis, techniques in conservation science, case studies and conservation action. In the second part of the course students undertake a research project designed to give practical experience of desk-based or field research and provide the opportunity to learn a wide range of skills. The project will be drawn broadly from the areas of conservation science covered in the course. The project will be based at the site of the most appropriate of the four partner institutions, and may be conducted, in part or in whole, at external research institutions or agencies in the UK or overseas during which regular contact would be maintained with the course tutor.

Duration of Course of Study

Full-time: One calendar year

Examination

Two 3.5-hour written examinations, coursework and written report (15,000 words).

Dates of Examination

Written papers	January and April
Coursework	Continuous Assessment
Project report	By 14 September

Control Systems

Additional Entry Requirements

Normally at least a good Upper Second Class Honours degree or equivalent in Engineering, Physics, Mathematics or another relevant subject.

Curriculum

Students are assessed on eight modules chosen from the examinable modules, provided that at least 4 of the 8 are core modules. Additional courses may be followed on a 'not-for-credit basis' at the discretion of the Course Organiser. The list of examinable modules is updated and published each year.

Students also undertake coursework and laboratory work associated with their studies.

Students also undertake an individual project occupying three months part-time (January to March) and four months full-time (June to September). A project may be undertaken as an intern within a company or other university provided the topic is suitable but only with the agreement of the Course Organiser. A student doing such a project may spend up to five months away from the College placed at the external organization during the project period.

Duration of course of study

Full-time: One calendar year

Examination

Each of the eight examinable modules is assessed by written examination. Students will also undertake assessed laboratory work and an individual project that will be assessed through the means of a dissertation and an assessed oral presentation.

Dates of Examination

Written exams	Start of Summer term
Assessed laboratory work	Autumn and Spring terms
Project dissertation	By September

Crop Protection

Additional Entry Requirements

Normally a degree in science, engineering or agriculture.

Curriculum

(A) All candidates will study the following core courses

1 Introduction to ecology and species identification
2 Population ecology – demography and management
3 Biological and Chemical control methods
4 Decision tools
5 Experimental design and statistical computing

In addition candidates will be required to select from the following (B) (C) (D) or (E)

(B) Entomology:

1 Insect and mite systematics
2 Glasshouse pests and virus vectors
3 Biotechnology
4 Economic and ecological decision making
5 Agricultural and forest entomology

(C) Insect Conservation and Diversity:

1 Insect and mite systematics
2 Insect diversity and evolution
3 Conservation in action
4 Ecology, practical taxonomy and population modelling
5 Theory and practice of biological control

(D) Plant Pathology:*

1 Biology of plant nematodes
2 Fungi, bacteria and viruses (including vectors)
3 Biotechnology
4 Economic and ecological decision making
5 Epidemiology of plant pathogens and Nematode-plant interactions

(E) Integrated Pest Management:

1 Insect and mite systematics
2 Fungi, bacteria and viruses (including vectors)
3 Biotechnology
4 Economic and ecological decision making
5 Theory and practice of biological control

The title of the degree awarded will be dependent upon the courses selected by the candidate as follows:

Courses selected	Degree awarded
AB	Entomology
AC	Entomology
AD	Plant Pathology*
AE	Integrated Pest Management

Students will also undertake a research project and submit a report thereon, which shall not normally exceed 10,000 words in length. Normally this will be at Silwood Park, but in special circumstances research may be at an outside institute.

Duration of Course of Study

Full-time:	One calendar year
Part-time:	Three calendar years

Examination

Three three-hour papers, a project report, assessment of coursework and oral examination at the discretion of the examiners.

Students following the part-time course enter the examination in two parts. In the second year they enter the written papers and are assessed on coursework. At the end of the third year the project report is examined.

Dates of Examination

Written papers:	One in January, two in April/May
Project reports:	By 14 September

*New admissions to the Plant Pathology pathway are suspended from entry in October 2008.

Earthquake Engineering

Additional Entry Requirements

Normally at least an Upper Second Class Honours degree in Civil Engineering. Candidates with degrees in other branches of engineering, or a suitable related subject and appropriate experience may also be considered.

Curriculum

The following compulsory modules will be taken:

Autumn Term
Engineering Seismology
Structural Dynamics
Reinforced Concrete I
Steel and Composite Design
Finite Element Analysis
Structural Analysis

Spring Term
Steel Design for Dynamic Loads
Seismic Design of Concrete Structures
Nonlinear Structural Analysis

The following elective modules will be taken:

Autumn Term (Candidates choose one module)
Prestressed Concrete
Structural Stability

Spring Term (Candidates choose three modules)
Earthquake Geotechnical Engineering
Structural Reliability Theory
Reinforced Concrete II
Design of Bridges
Plated Structures

Students will undertake a major final project on an approved topic and will submit a report thereon.

Part-time Students

For students attending over two years: attendance of Autumn term in Year 1 and Spring term in Year 2; alternatively, attendance may be arranged on average for two days per week in the first year, and one day per week in the second year of study. The final project or dissertation is undertaken, under regular

guidance from a College supervisor, by private study or by arrangement at the student's place of employment.

For students attending over three years: attendance of one day per week on average. The final dissertation is undertaken, under regular guidance from a College supervisor, by private study or by arrangement at the student's place of employment.

Duration of Course of Study

Full-time:	One calendar year
Part-time:	Two or three calendar years

Examination

12 two-hour written papers
Assessment of Coursework
Project/dissertation
Oral examination at the discretion of the examiners

Dates of Examination

Written paper	January and April/May
Project/dissertation	By 1 September
Oral	September

For students taking the part-time course, the written examinations and coursework assessment will take place in the year in which the particular courses are taken; the final project report assessment will take place in the final year of study.

Ecological Applications

Additional Entry Requirements

Normally at least an Upper Second Class Honours degree in science, engineering or agriculture.

Curriculum

In the first part of the course students take a mixture of core and option modules covering the following topics:

1. Introduction to course
2. Insect and mite systematics of pests and natural enemies
3. A choice of
    a) Anthropogenic damage, forest pathology and forest pests
    b) Diversity and Evolution of Insects
    c) Integrated Pest Management
    d) i. Pollution Ecology + ii. Global Diversity
4. Conservation in Action
5. Population Ecology
6. Biological and Chemical Control Methods
7. Decision tools
8. A choice of
    a) Economic and Ecological Decision Making
    b) Evolutionary analysis, macroevolution, and phylogeny reconstruction
9. Statistics and Experimental Design
10. A choice of
    a) Forest Ecology, Management and Conservation
    b) Theory and Practice of Biological Control
    c) i. Forest Ecology + ii. Macroecology + iii. Biodiversity and Ecosystem Function
11. Synthesis and Review of taught component

In addition to the formal teaching, students are expected to attend two weekly seminar series designed to complement their experience and expose them to a range of professions and disciplines. In the second part of the course, students undertake a research project on an advanced topic selected from the Entomology, Conservation and Forest Protection, Integrated Pest Management or Ecology, Evolution and Conservation portfolios. Normally the research will be conducted at Silwood Park, but in special circumstances the project may, with the agreement of the Course Director, involve a period of up to six months spent outside the College, during which time regular contact must be maintained with the Course Director. Students will write up the project in the form of a dissertation which shall not normally exceed 10,000 words in length. A *viva voce* is held with the External Examiner following the project.

Duration of Course of Study

Full-time: One calendar year

Examination

Three three-hour written papers; a project report; assessment of coursework, including an oral examination.

Dates of Examination

Written papers	One in January, two in April/May
Coursework	Continuous assessment
Project report	By 14 September

Ecology, Evolution and Conservation

Additional Entry Requirements

Normally a degree in a science subject.

Curriculum

The first part of the course consists of lectures and seminars covering the biological, analytical and modelling techniques essential for understanding ecology and evolution and their application in conservation. In the second part of the course students undertake a research project designed to give practical experience of laboratory and field research and provide the opportunity to learn a wide range of skills.

Part-time students

Flexible attendance is possible for students taking the course on a part time basis. Students will take the first five weeks of the taught course in Year 1 and then the remainder of the taught course either taken as term 1 in Year 1 and term 2 in Year 2 or as alternating weeks taken in Year 1 and Year 2. Students taking the course over two years will undertake the research project during Years 1 and 2. Students taking the course over three years will undertake the research project during Years 2 and 3.

Duration of Course of Study

Full-time:	One calendar year
Part-time:	Two or three calendar years

Examination

Two three-hour and one two-hour written examinations; coursework; written report (8,000 words) in the form of a scientific paper and *viva voce*.

Dates of Examination

Written papers	January and March
Coursework	Continuous assessment
Project report and *viva voce*	By 14 September and 23 September respectively

For students taking the part-time course, the written examinations and coursework assessment will take place in the year in which the particular components are taken; the project report assessment and *viva voce* will take place in the final year of study.

Engineering Geology for Ground Models

Additional Entry Requirements

Normally at least an Upper Second Class Honours degree in either geology or earth science, provided the latter contains at least 75% geology. Candidates with degrees in other sciences and in engineering, and/or appropriate experience, may also be considered.

Curriculum

Students are required to complete the following modules:

Basic competences in Engineering Geology
The Engineering Geology of Rocks and Soils
Ground Investigation
Soil Mechanics
Engineering Rock Mechanics
Hydrogeology
Geographic Information Systems for Ground Models
Use of commercial software for Ground Models
Hazard Quantification and Risk Analyses for Ground Engineering
Hydrology for Contaminated Land
Professional Practice
Case Histories in Engineering Geology

In addition students will undertake an individual three-month project and submit a report thereon.

Part-time Students

For students attending over two years: attendance of Autumn term in Year 1 and Spring term in Year 2. The dissertation is undertaken, under regular guidance from a College supervisor, by private study or by arrangement at the student's place of employment.

Duration of Course of Study

Full-time: One calendar year
Part-time: Two calendar years

Examination

The modules are assessed by 18 hours of unseen examination papers set as five written examinations, the last six hours of which represent the fifth exam and take the form of an open-book paper practical.
Continuous assessment of course and practical work.
A project report.
An oral examination at the discretion of the examiners.

Dates of Examination

Written papers	April
Course and practical work	Continuous assessment
Project report	To be submitted at the end of August

For students taking the part-time course, the written examinations and coursework assessment will take place in the year in which the particular courses are taken; the dissertation will be assessed in the final year of study.

Engineering Geology for Ground Models and Business Management

Additional Entry Requirements

Normally at least an Upper Second Class Honours degree in either geology or earth science, provided the latter contains at least 75% geology. Candidates with degrees in other sciences and in engineering, and/or appropriate experience, may also be considered.

Curriculum

Students are required to complete the following modules:

Basic competences in Engineering Geology
The Engineering Geology of Rocks and Soils
Ground Investigation
Soil Mechanics
Engineering Rock Mechanics
Hydrogeology
Geographic Information Systems for Ground Models
Use of commercial software for Ground Models
Hazard Quantification and Risk Analyses for Ground Engineering
Hydrology for Contaminated Land
Professional Practice
Case Histories in Engineering Geology
Business Management 1, 2, 3, and 4

In addition students will undertake an individual three-month project and submit a report thereon.

Part-time Students

For students attending over two years: attendance of Autumn term in Year 1 and Spring term in Year 2. The dissertation is undertaken, under regular guidance from a College supervisor, by private study or by arrangement at the student's place of employment.

Duration of Course of Study

Full-time: One calendar year
Part-time: Two calendar years

Examination

The modules are assessed by 18 hours of unseen examination papers set as five written examinations, the last six hours of which represent the fifth exam and take the form of an open-book paper practical.
Continuous assessment of course and practical work.
A project report.
An oral examination at the discretion of the examiners.

Dates of Examination

Written papers	April
Course and practical work	Continuous assessment
Project report	To be submitted at the end of August

For students taking the part-time course, the written examinations and coursework assessment will take place in the year in which the particular courses are taken; the dissertation will be assessed in the final year of study.

Engineering Geology for Ground Models and Sustainable Development

Additional Entry Requirements

Normally at least an Upper Second Class Honours degree in either geology or earth science, provided the latter contains at least 75% geology. Candidates with degrees in other sciences and in engineering, and/or appropriate experience, may also be considered.

Curriculum

Students are required to complete the following modules:

Basic competences in Engineering Geology
The Engineering Geology of Rocks and Soils
Ground Investigation
Soil Mechanics
Engineering Rock Mechanics
Hydrogeology
Geographic Information Systems for Ground Models
Use of commercial software for Ground Models
Hazard Quantification and Risk Analyses for Ground Engineering
Hydrology for Contaminated Land
Professional Practice
Case Histories in Engineering Geology
Sustainable Development 1 and 2

In addition students will undertake an individual three-month project and submit a report thereon.

Part-time Students

For students attending over two years: attendance of Autumn term in Year 1 and Spring term in Year 2. The dissertation is undertaken, under regular guidance from a College supervisor, by private study or by arrangement at the student's place of employment.

Duration of Course of Study

Full-time: One calendar year
Part-time: Two calendar years

Examination

The modules are assessed by 18 hours of unseen examination papers set as five written examinations, the last six hours of which represent the fifth exam and take the form of an open-book paper practical.
Continuous assessment of course and practical work.
A project report.
An oral examination at the discretion of the examiners.

Dates of Examination

Written papers	April
Course and practical work	Continuous assessment
Project report	To be submitted at the end of August

For students taking the part-time course, the written examinations and coursework assessment will take place in the year in which the particular courses are taken; the dissertation will be assessed in the final year of study.

Environmental Engineering

Additional Entry Requirements

Normally at least an Upper Second Class Honours degree in Civil Engineering, Physics, Mathematics or another relevant science or engineering degree. Candidates with degrees in other branches of engineering or the physical sciences and appropriate experience may also be considered.

Curriculum

The following compulsory modules will be taken:

Autumn Term
Microbiology for Environmental Engineering
Mathematical and Statistical Modelling
Hydroinformatics
Chemistry for Environmental Engineering
Environmental Fluid Mechanics
Urban Hydrology and Urban Drainage

Spring Term
Water and Wastewater Treatment
Water, Wastes and Health in Developing Countries
Water Supply and Distribution
Solid Waste Management
Air Pollution Control
Contaminated Land and Groundwater

The following modules will also be taken:

Autumn Term
EITHER
Environmental Analysis
Landfill Engineering

OR
Business Management I or Sustainable Development I

Spring Term
EITHER
Advanced Water and Wastewater Treatment
Environmental Engineering Design Project

OR
Business Management II or Sustainable Development II

Students will also undertake an individual research project on an approved topic and will submit a report thereon.

Each student is required to attend a study tour in the UK and/or Europe.

Part-time Students

Flexible attendance is possible for students attending the course on a part-time basis. For students taking the course over three years, attendance of lectures for one day per week in the Autumn and Spring terms is normally required in each year.

For students taking the course over two years, attendance at Autumn and Spring term lectures could be for two days per week in the first year and one day per week in Year 2 or equivalent.

Alternatively full-time attendance for the 11 week Autumn term in Year 1 could be followed by full-time attendance for the 11 week Spring term in Year 2. The dissertation is normally undertaken, under regular guidance from a College supervisor, by private study or by arrangement at the student's place of work.

Duration of Course of Study

Full-time:	One calendar year
Part-time:	Two or three calendar years

Examination

Between 12 and 20 hours of written papers
Assessment of Coursework
Dissertation
Oral examination at the discretion of the examiners which may be used to replace one or more of the written papers

Dates of Examination

Written papers	April/May
Dissertation	By 1 September
Oral	September

For students taking the part-time course, the written examinations and coursework assessment will take place in the year in which the particular courses are taken; the project report assessment in the final year of study.

Depending on the options chosen students will graduate with the MSc in Environmental Engineering or the MSc in Environmental Engineering and Business Management or the MSc in Environmental Engineering and Sustainable Development.

Environmental Technology

Additional Entry Requirements

A degree in science or engineering subjects.

Curriculum

A core course of lectures, practicals and seminars, compulsory for all students on the course, will be provided during the Autumn and Spring terms. The course will cover:

1. Introduction to environmental technology and management
2. The physical environment
3. Principles of applied ecology
4. Primary mineral production and energy
5. Urban technology
6. Resource economics and environmental policy
7. Application of operations research to environmental problems
8. Sources and choices of technology
9. Seminars on environmental technology and management

In the Spring term students will be able to select one option from the following for further study:

1. Ecological management
2. Environmental physics
3. Land use/transport planning and management
4. Mineral production and the environment
5. Pollution management
6. Pollution control and safety engineering
7. Water management
8. Energy policy
9. Environmental analysis and assessment
10. Business and the environment
11. Global environmental change and policy
12. Environmental economics and policy

[Not all specialist options will be offered each year.]

The Summer term will be devoted to a dissertation project stemming from one of the specialist options. The project will normally be undertaken at the College but may involve a period of up to four months spent outside the College, during which regular contact would be maintained with the course tutor.

Duration of Course of Study

Full-time:	One calendar year
Part-time:	Two calendar years

Examination

Two three-hour written papers on the core course and one three-hour written paper on the selected option; assessment of coursework; a project report or dissertation; an oral examination at the discretion of the examiners.

A student following the course part-time will:

(i) enter for all three written papers in the first year.
(ii) enter the remaining parts of the examination in the second year.

Dates of Examination

Written papers	*Core course*	End of Autumn term
	Selected option	End of Spring term
Project report or dissertation		By mid-September

Finance

Additional Entry Requirements

Normally at least an Upper Second Class Honours degree or equivalent in economics, science, engineering or mathematics.

Curriculum

(a) *Compulsory Courses*

Introduction to Accounting
Introduction to Finance
Ethics and Professional Standards in Finance
Business Valuation
Investments and Portfolio Management
Mathematics for Finance
Corporate Finance
Financial Econometrics
Financial Modelling
Markets and Securities
The Finance Industry
Asset Pricing and Derivatives
Advanced Financial Econometrics
Visual Basic (VBA)

(b) *Three of the following electives*

Applied Corporate Finance
Structured Credit and Equity Products
Advanced Numerical Finance with C++
Advanced Options Theory
Corporate Finance in Regulated Industries
Credit Risk
Fixed-Income Securities
Hedge Funds and Alternative Investment Strategies
International Finance
Introduction to Numerical Finance with C++
Investment/Consumption Models and Incomplete Markets
Mathematical Option Pricing
Mergers and Acquisitions
Numerical Stochastics
Pricing Kernel Approach to Hybrid Modelling
Private Equity and Entrepreneurial Finance
Spectral Theory for Mathematical Finance
Stochastic Differential Equations and Interest Rate Models
Topics in Financial Engineering
Venture Capital Finance and Innovation

Banking
Advanced Portfolio Management

Further electives may be introduced later; not all electives will necessarily be offered each year.

(c) Students will also undertake one of the following:
An individual project on an approved topic
The Applied Financial Research taught course and an additional elective

Duration of Course of Study

Full-time: One calendar year (starting September)

Examination

On-line tests for the Accounting, Introduction to Finance, Ethics and Professional Standards and VBA courses, three-hour written papers for the remaining core courses and two-hour written papers for the electives (with the exception of two electives which are assessed by coursework only), project report or applied financial research report and an oral examination at the examiners' discretion.

Dates of Examination

Written papers:	December, March, June
On-line accounting test:	October with re-sit opportunities throughout the year
On-line Introduction to Finance test	October
On-line ethics test:	June
Coursework:	Continuous assessment
Project Report:	August

A student who has failed one or more of the written examinations may apply to the Programme Director to be permitted to take their one permitted re-sit within the same academic year.

General Structural Engineering

Additional Entry Requirements

Normally at least an Upper Second Class Honours degree in Civil, Mechanical, Structural or Aeronautical Engineering. Candidates with degrees in other branches of engineering or the physical sciences, Metallurgy or Materials Science and appropriate experience may also be considered.

Curriculum

The following compulsory modules will be taken:

Autumn Term
Reinforced Concrete I
Steel and Composite Design
Structural Analysis

Spring Term
Design and Construction
Design of Steel Buildings

The following elective modules will be taken:

Autumn Term (Candidates choose four modules)
Structural Stability
Plastic Collapse and Fatigue
Prestressed Concrete
Concrete Materials
Structural Steel Technology
Structural Dynamics
Finite Element Analysis (FEA)

Spring Term (Candidates choose four modules)
Plated Structures
Reinforced Concrete II
Design of Bridges
Time and Temperature Behaviour of Concrete Structures
Structural Reliability Theory
Cold-formed Steel Design
Nonlinear Structural Analysis

Students will undertake an individual project on an approved topic and will submit a report thereon.

Part-time Students

For students attending over two years: attendance of Autumn term in Year 1 and Spring term in Year 2. Alternatively, students may attend on average two days per week in Year 1 and one day per week in Year 2.

For students attending over three years: attendance of on average one day per week in each of the years. The dissertation is undertaken, under regular guidance from a College supervisor, by private study or by arrangement at the student's place of employment.

Duration of Course of Study

Full-time:	One calendar year
Part-time:	Two or Three calendar years

Examination

24 hours' worth of examinations through the year.
Assessment of coursework in individual modules.
End of year project option for: Major Design Project or Research Dissertation.
Oral examination at the discretion of the examiners.

Dates of Examination

Written papers:	January and April/May
End-of-year project:	By first week in September
Oral examination:	September

For students taking the part-time course, the written examinations and coursework assessment will take place in the year in which the particular courses are taken; the project report assessment in the final year of study.

History of Science, Medicine and Technology
Science, Technology, Medicine and Society
(Joint courses with UCL)

Additional Entry Requirements

Normally at least an Upper Second Class Honours degree (or approved equivalent) in science, technology, history or a relevant social science.

Curriculum and Assessment

The Course comprises three parts: A, B and C (see below). In the first term students take a common Core Course (A) for which they must submit four essays and sit one written examination. In the second and third terms students select three from the various Option Courses (B) offered. Students must write two essays for each Option Course. From June until late September students must write an original Dissertation (C).

Part A: Core Course
Introduction to the history, philosophy and sociology of science, technology and medicine.

Part B: Option Courses
1. Science, Technology and Medicine in Antiquity
2. The Scientific Revolution, 1450-1750
3. Ideas of Health and Sickness
4. The Sciences in the Age of Industry, 1750-1920
5. History of the Human Sciences
6. Philosophy of Science
7. Science, Technology and Global History
8. Science, Technology and Medicine in the 20th Century
9. Sociology of Science and Technology
10. Science, Governance and the Public
11. In exceptional circumstances an agreed course by a similarly modularised MSc in the University of London.

In terms 2 and 3 full-time students will take three options from the list. Each option course will involve ten two-hour sessions in term 2 and tutorials assisting with the research and writing of substantial essays in term 3. Part-time students will take one or two options in the first year and the remainder in the second year.

Students passing at least two of the options from courses 1–8 above will qualify for the **MSc in History of Science, Medicine and Technology**. Students passing at least two of the options from courses 8–10 above will qualify for the **MSc in Science, Technology, Medicine and Society**. If a student is eligible for both degrees, the choice will be decided by the Board of Examiners based on the subject of the dissertation. Students may state a preference but the final decision rests with the Board of Examiners.

Part C: Dissertation
All students are required to undertake an individual research project on an approved topic and to submit a dissertation (10-15,000 words) thereon by 20 September in the final year of study.

Duration of Course of Study

Full-time: One calendar year
Part-time: Two calendar years

Overall Assessment

Part A: Students submit four essays, each 2,500 words in length, of which only the best three count towards the final mark. Students also sit a three-hour written examination in January (of the second year in the case of part-timers).

Part B: Students write two essays, 5,000 words in length, to be completed by an agreed date in May.

Part C: A 10-15,000 word dissertation to be completed by 20 September. An oral examination may be given at the examiners' discretion.

Students following the course part-time take the core course exam in their second year by which time they must have completed all their core course essays. They must take two option courses in one of their two years and one option course in the other. Their dissertation must be completed by 20 September in their second year of study.

Human Molecular Genetics

Additional Entry Requirements

Normally a first degree in biological, chemical or biochemical science, or related subjects.

Candidates with medical or nursing degrees, or with other backgrounds, may be considered.

Curriculum

Students will follow a programme of seminars and lectures covering the following topics: fundamentals of human molecular genetics; approaches to study of human genetic disease; cytogenetics and molecular diagnostics; monogenic and complex disease; statistical genetics and computing, animal models; developmental and comparative genetics; cancer genetics and immunogenetics; introduction to clinical genetics. In addition, students will undertake a six-month research project and complete a project report.

Duration of Course of Study

Full-time:	One calendar year
Part-time:	Two calendar years

Examination

Three three-hour written papers, coursework assessment, project report and a *viva voce* examination with the external examiners, examining the taught part of the course and the project work.

Dates of Examination

Written papers	February
Project report	First week of September
Viva voce	By 23 September

Hydrology and Water Resources Management

Additional Entry Requirements

Normally at least an Upper Second Class Honours degree in an Engineering or Science subject. A good GCE A level in Mathematics is a minimum requirement.

Curriculum

The following compulsory modules will be taken:

Autumn Term
Hydrogeology and Groundwater
Hydroinformatics
Hydrological Processes
Urban Hydrology
Mathematical and Statistical Modelling
Chemistry for Hydrologists
Environmental Fluid Mechanics

Spring Term
Contaminated Land and Groundwater
Stochastic Hydrology
Rainfall-runoff Modelling and Flood Hydrology
Water Quality Modelling
Water Resources Management
Water, Wastes and Health in Developing Countries

The following modules will also be taken:

Autumn Term
EITHER
Hydrometry
Climate Change (half module)
Irrigation (half module)
OR
Business Management I and II or Sustainable Development I

Spring Term
EITHER
Groundwater Flow and Quality Modelling
Design Project

OR
Business Management III and IV or Sustainable Development II

Students will also undertake an individual research project on an approved topic and will submit a report thereon.

Each student is required to attend a study tour in the UK and/or Europe.

Part-time Students

Flexible attendance is possible for students attending the course on a part-time basis. For students taking the course over three years, attendance of lectures for one day per week in the Autumn and Spring terms is normally required in each year.

For students taking the course over two years, attendance at Autumn and Spring term lectures could be for two days per week in the first year and one day per week in Year 2 or equivalent. Alternatively full-time attendance for the 11 week Autumn term in Year 1 could be followed by full-time attendance for the 11 week Spring term in Year 2.

The dissertation is normally undertaken, under regular guidance from a College supervisor, by private study or by arrangement at the student's place of work.

Duration of Course of Study

Full-time:	One calendar year
Part-time:	Two or three calendar years

Examination

Between 12 and 20 hours of written papers.
Assessment of Coursework.
Dissertation.
Oral examination at the discretion of the examiners, which may be used to replace one or more of the written papers.

Dates of Examination

Written papers	April/May
Dissertation	By 1 September
Oral	September

For students taking the part-time course, the written examinations and coursework assessment will take place in the year in which the particular courses are taken; the project report assessment in the final year of study.

Depending on the options chosen students will graduate with the MSc in Hydrology and Water Resources Management or the MSc in Hydrology and Business Management or the MSc in Hydrology and Sustainable Development.

Immunology

Curriculum

The course consists of:

A five-month course of lectures, practicals and seminars covering academic and practical aspects of cellular, molecular and clinical immunology.

A six-month specialised laboratory research study of an approved topic and the preparation of a report.

Duration of Course of Study

Full-time: One calendar year

Examination

Three two-hour written papers; one three-hour practical examination; assessment of the research report; and an oral examination covering all aspects of the course.

Students whose performance in the written examinations is unsatisfactory may be required to withdraw from the course.

Dates of Examination

The written papers and the practical examination will be held in February. The research report must be submitted by 5 September and the oral examination will be held later in the same month.

Infection Management for Pharmacists

Additional Entry Requirements

A degree in pharmacy (BSc, BPharm, MPharm) ***and*** at least two years' postgraduate experience either in a hospital pharmacy, an NHS pharmacy advisory role or in the pharmaceutical industry.

Curriculum

The course consists of a 12-month programme of taught modules followed by a 12-month research project. In the first year students will study six compulsory taught modules covering the following areas: Understanding Microbiology and Infection; the Basics of Antibiotic Resistance; Industrial Aspects; Principles of Good Prescribing; Therapeutics of Major Clinical Syndromes; Strategies, Policies and the Future. In the second year students will undertake a research project which may be clinical, laboratory-based or pharmacoeconomic.

In addition, taught sessions on the future role of the Pharmacist and changing prescribing behaviour will be included in the second year.

Duration of Course of Study

Part-time: Two calendar years

Examination

Written papers totalling not more than six hours, assessment of course work, a project dissertation and a *viva voce* examination.

Dates of Examination

Written papers	September of the first year
Dissertation	By 25 September of the second year
Viva voce	By 25 September of the second year

Innovation Design Engineering (joint MA/MSc with the Royal College of Art)

Additional Entry Requirements

The minimum qualification for admission is normally an Upper Second Class Honours degree from a UK academic institution or an overseas equivalent. Candidates wishing to apply who do not meet these criteria but are able to demonstrate significant attributes relevant to the degree are invited to apply and their case may be put forward for consideration by the concessions committee of the RCA. All applicants must submit a portfolio of work and a personal statement. All short-listed applicants are interviewed.

Curriculum

The course programme predominantly uses design project modules as the context for learning the skills and knowledge of innovation design engineering. These projects are activities which include lecture series and skills-based modules, as well as staff and visiting tutors for group and solo tutorials.

In the first year there are ten modules, tutorials and a seminar series. Each of these focuses on a particular aspect of innovation design engineering - e.g. environmental considerations, form, manufacturing technologies - and involves practising designing skills, as well as design research activities both within product development itself and in exploring user and broader social issues.

Initially, the course has introductory modules and workshop skills periods. As the students gain experience as designers, the intensity of taught skills is reduced and the modules become more exploratory. Emphasis is placed on generating imaginative ideas, and on testing work-in-progress through three dimensional modelling and feedback from potential users, design and other experts.

The IDE Seminar Series focuses on the following areas:
Creative Business Lecture Series (IDE1+IDE2)
Technology
Drawing and Digital Methods
We Could be Heroes (IDE1+IDE2)

In addition the Critical and Historical Studies and Dissertation (CHS) module provides a unique environment for postgraduate art and design students to reflect upon their own practice, and to engage with students from their own and other disciplines.

The second year of the course consists of a programme of work involving a solo project of the students' own choosing running throughout the year, and a team-based project during the first term and part of the second term, for examination early in the Spring term. The solo project also forms the subject of a solo project report involving a full description of the project development and results.

Group and major solo projects can fall into three categories:
1. Design for Manufacture
2. Experimental Design
3. Design Enterprise

Duration of Course of Study

Full-time: 21 months

Examination

First year:

Interim Examination (May of the first year). This is held during term 3 of the first year to determine whether a student can pass into the second year of the course and is based on a portfolio of selected work since the start of the course.
CHS Dissertation.

Second year:

Final Examination. The examination is held in two parts:

Part One (examination of the group project)	February Year 2
Part Two (the Final Examination)	Late June Year 2

Course Component – Studio (studentship, professional orientation)

The RCA MA is ungraded. However each category of the work in the MA is graded.

The Imperial MSc and RCA MA degrees are awarded together. One cannot be awarded without the other.

Integrative Neuroscience*

Additional Entry Requirements

Normally a first degree or equivalent in medicine, biological science, psychology, dentistry or veterinary medicine or an appropriate science degree.

Curriculum

Students will follow an introductory module and a further three courses covering a wide range of neuroscience topics. Courses will include subjects such as cellular, molecular, developmental, systems and clinical neuroscience. Each student will also carry out an individual research project and submit a report of 10,000 words thereon.

Duration of Course of Study

Full-time: One calendar year

Examination

Three three-hour written papers, coursework including essays and an oral presentation, a report on the research project and an oral examination.

Dates of Examination

Written papers	March
Coursework	Continuous assessment
Project report and oral examination	By 30 August and 25 September respectively

*New admissions suspended for entry in October 2011.

International Health Management

Additional Entry Requirements

Normally at least an Upper Second Class Honours degree or equivalent in medicine, health sciences, social sciences, physical sciences, engineering, informatics or another relevant discipline. It is normally desirable to have a minimum of one year's post graduation work experience.

Curriculum

Students are required to follow the compulsory courses:

(a) Accounting
Business Plan Competition
Contemporary Topics in Healthcare
Entrepreneurship
Evaluating Evidence for Managerial Decision Making
Health Economics
Health Informatics
Health Systems Policy and Financing
Management Challenges of Healthcare Organisations
Managing Change and Innovation in Healthcare
Marketing
Organisational Behaviour and Human Resource Management
Strategic Management

(b) All students will be required to complete the Applications module (Healthcare Sector project and Healthcare essay).

Duration of Course of Study

Full-time: One calendar year

Examination

1. The Evaluating Evidence for Managerial Decision Making, Entrepreneurship and Business Plan courses are assessed by coursework only. All other courses are assessed by a combination of examination papers and coursework. The Evaluating Evidence for Managerial Decision Making course is assessed by group assignment.
2. The Applications module is assessed by coursework only.
3. Oral examination at the examiners' discretion.

Dates of Examination

Written papers	January and April/May
Coursework	Continuous assessment

A student who has failed one or more of the written examinations may apply to the course director to be permitted to take their one permitted re-sit within the same academic year.

Management

Additional Entry Requirements

An Upper Second Class Honours degree or equivalent.

Curriculum

a) Students are required to take the following compulsory courses:

Accounting
Business Economics
Business Plan Competition
Business Simulation Exercise
Entrepreneurship
Finance
Innovation Management Fundamentals
International Marketing
Organisational Behaviour and Human Resource Management
Project Management
Strategic Management
Careers and professional development sessions

b) Students choose one of the following pathways:

Digital Business
Globalisation, Business Sustainability and Corporate Social Responsibility
Innovation and Design

c) All students will also be required to complete the Applications module (Consulting Project course and Management essay).

d) All students will be required to attend careers and professional development sessions.

Duration of Course of Study

Full-time: One calendar year

Examination

1. The Business Simulation Exercise, Entrepreneurship and Business Plan courses are assessed by coursework only. All other courses are assessed by a combination of examination papers and coursework. Students must attend 60% of the Careers Workshops (three in the Autumn and three in the Spring term) in order to pass the course.
2. The Applications module is assessed by coursework only.
3. Oral examination at the examiners' discretion.

4. Students are required to pass a Quantitative Skills test.

Dates of Examination

Written papers	January and April/May
Coursework	Continuous assessment

A student who has failed one or more of the written examinations may apply to the course director to be permitted to take their one permitted re-sit within the same academic year.

Mathematics and Finance

Additional Entry Requirements

A first degree, normally of at least Upper Second Class Honours, in a strongly mathematical subject (mathematics, physics, engineering, mathematical economics).

Curriculum

Students must follow four core courses in theory of finance, stochastic processes, scientific computation and mathematical option pricing. In addition, four further courses in the areas of mathematics and finance must be taken, selected from optional courses offered by the Department of Mathematics and the Business School. All students will undertake an individual project and submit a dissertation thereon.

Duration of Course of Study

Full-time:	One calendar year
Part-time:	Two calendar years (suspended until further notice)

Examination

Eight two-hour or three-hour written papers, assessment of coursework, project report and an oral examination at the examiners' discretion. Students following the part-time course will normally take at least four written papers in the first year and the remainder in the second year. Students wishing to take more than four courses in the first year may only do so with the approval of the Course Organiser.

Dates of Examination

Written papers	January/April/May/June
Coursework	Continuous assessment
Project report	By 15 September

Medical Ultrasound

Additional Entry Requirements

A first degree in medicine or a biological, engineering or physical science subject. Students registering for the part-time course must be working at least three days per week in an ultrasound clinic for the duration of the course.

Curriculum

Students will follow a core curriculum including the study of the physics of ultrasound and the clinical use of imaging. Students will then follow one of the specialised disciplines of echocardiography, obstetrics and gynaecology ultrasound or vascular ultrasound. Speciality courses will cover the theoretical and practical aspects of the subject.

Students will also undertake an individual project and submit a report thereon.

Duration of Course of Study

Full-time:	One calendar year
Part-time:	Two calendar years

(The echocardiography speciality is not available on a part-time basis.)

Examination

Two three-hour written papers, clinical examination, project report, and an oral examination on the project.

Dates of Examination

	Full-time	*Part-time*
Written papers	June	June of the first year
Clinical examination	June	June of the second year
Project report	By 31 August	By 31 August of the second year
Oral examination	September	September of the second year

Students who successfully complete the specialty course in echocardiography will be awarded the MSc in Medical Ultrasound (Echocardiography).

Metals and Energy Finance

Additional Entry Requirements

Normally a degree in engineering or the physical sciences or economics with a substantial mathematics element. Appropriate experience, while not essential, would be an advantage.

Curriculum

The course comprises formal classroom based teaching, practical classes and seminars in the Autumn and Spring terms in the areas of Cash Flow Modelling, Mineral Deposits Studies, Petroleum Engineering, Petroleum Geology, Accounting, Mathematical Techniques in Finance, Resource Evaluation, Metals and Energy Project Appraisal and Finance, Management of Projects, Markets and Supplies, Minerals Engineering, Extraction Metallurgy, Quantitative Finance and Strategic Management.

Students with backgrounds in Mathematics will be required to follow a European Language option. Those students who would benefit from supportive teaching in mathematical techniques will be offered this as an alternative.

Students will join the continuing professional development course run in March on Mineral Project Appraisal and Finance.

Students will attend an excursion of at least ten days to a region of active mining, downstream metal and mineral processing and energy development in the Summer term.

During the period July to September students will undertake a dissertation, which may involve a period of up to three months spent outside the College during which contact will be maintained with the course tutor.

Duration of Course of Study

Full-time: One calendar year

Examination

Four three-hour written papers, coursework assessment, dissertation report plus one written paper and an oral examination for the language option.

An oral examination may be held at the discretion of the examiners.

Dates of Examination

Written papers (including language option if applicable):	Summer Term
Coursework:	Continuous assessment
Dissertation:	By 21 September
Oral examination:	September

Modern Epidemiology

Additional Entry Requirements

Normally an Upper Second Class Honours degree, or better. Normally a background in mathematics or statistics, medicine or biological sciences.

Curriculum

The course will provide training in modern epidemiology and biostatistical methods, with a particular focus on environmental epidemiology and spatial statistics, the epidemiology, evolution and control of infectious disease, and Bayesian methods in epidemiology. All students will study the core course which will focus on the fundamental concepts in epidemiology. Students will then choose four modules combining to create one of three specialities: Infectious Disease Epidemiology; Biostatistics; and Environmental and Chronic Disease. Students may, if they wish, elect to study for the broader title of MSc in Modern Epidemiology without reference to specialisation. Students will undertake an individual research project of 18 weeks' duration, selected from a range of research areas. Projects may, or may not, be chosen to fit with a specialism pathway (some students may decide not to specialise in one particular subject area as given above). It is possible, with the agreement of the Course Director, that the project may be carried out in collaboration with external companies or government agencies. In such instances, regular contact must be maintained with the Course Director, and a co-supervisor will be appointed at the external location.

Duration of Course of Study

Full-time:	One calendar year
Part-time:	Three calendar years (one term per year)

Examination

Two two-hour written papers; assessment of three mini-projects (to include a written essay of 3,000 words) and an oral presentation; dissertation of 10,000 words; an oral presentation and oral examination on the dissertation.

Dates of Examination

Full-time

Written papers	January
Mini projects and Oral Presentation	Beginning of the third term
Dissertation	Last Friday in August
Oral Presentation and Oral Examination	Between 10 and 25 September

Part-time

Written papers	January of the first year
Mini projects and Oral Presentation	Beginning of the third term of the second year
Dissertation	Last Friday in August of the third year
Oral Presentation and Oral Examination	Between 10 and 25 September of the third year

Students who successfully complete the Biostatistics pathway will be awarded the MSc in Modern Epidemiology – Biostatistics

Students who successfully complete the Environmental and Chronic Disease pathway will be awarded the MSc in Modern Epidemiology – Environmental and Chronic Disease

Students who successfully complete the Infectious Disease pathway will be awarded the MSc in Modern Epidemiology – Infectious Diseases

Students may, if they wish, elect to be awarded the broader title of MSc in Modern Epidemiology without reference to specialisation.

Molecular Biology and Pathology of Viruses

Additional Entry Requirements

A first degree in a biological science or medicine or veterinary science.

Curriculum

The course has an integrated approach to the understanding of the nature of viruses and their role in disease pathogenesis, with the emphasis on the understanding of these processes at the molecular level. Topics which are covered in depth include: fundamentals of molecular and cell biology, the structure of viruses and their genomes, the interaction of viruses with cells, virus gene expression, modes of replication and transmission, the pathogenesis of virus infections, the detection, prevention and treatment of virus Infections, virus epidemiology, genetics and evolution of viruses.

Duration of Course of Study

Full-time: One calendar year

Examination

Two three-hour written papers, assessment of coursework and practical work, an individual project report (15,000 to 20,000 words) and an oral examination covering both the taught course and the research project.

Dates of Examination

Written papers	Late February
Project report	End of August
Oral Examination	Mid September

Molecular Medicine

Additional Entry Requirements

A degree in medicine, dentistry, veterinary medicine or an appropriate basic science discipline.

Curriculum

The course provides an advanced academic, laboratory and research training in modern molecular and cellular biology as applied to medicine. The course comprises a five-month taught module followed by a seven-month laboratory based research project. Students will be provided with advanced academic knowledge and laboratory training in the field of molecular biology and molecular medicine.

Duration of Course of Study

Full time: One calendar year

Examination

(a) Three written examinations and assessment of coursework.
(b) Assessment of project report and oral examination.

Dates of Examination

(a) The written examinations will be held in the last week of February or the first two weeks of March. These will include essay, practical and short answer question based examinations and a critique of a scientific paper. Assessed coursework will include a poster presentation and research presentation.
(b) The project report must be submitted by the end of the first week of September. The oral examination will be held in the third or fourth weeks of September.

Nuclear Engineering

Additional Entry Requirements

Normally a First or good Upper Second Class Honours BEng or MEng degree or equivalent overseas qualification in Mechanical, Chemical or Civil Engineering. Alternatively a First or good Upper Second Class Honours BSc or MSci degree or equivalent overseas qualification in Physics, Chemistry or Materials Science.

Curriculum
The following compulsory modules will be taken:

Autumn Term
Introduction to Nuclear Energy
Nuclear Thermal Hydraulics
Materials for Reactor Systems
Modelling for Nuclear Engineers

Journal Club with personal tutor

Spring Term
Nuclear Chemical Engineering
Reactor Physics
Nuclear Safety Management
Nuclear Waste Management and Decommissioning

Literature review and project plan for the research topic.

Students will undertake an individual research project on an approved topic. Some of these may be in collaboration with partners in the nuclear industry and involve placement with the partner for some, or all, of the project.

Students will be required to attend a series of workshops to enhance the development of their general research, personal and transferable skills.

Summer Term
Students will work full-time on their research project and will submit a report thereon.

Duration of Course of Study

Full-time: One calendar year

Examination

Introduction to Nuclear Energy is assessed by a 1 hour exam;

Written papers of a minimum of 2 hours and a maximum of 3 hours will be set for the core modules of Nuclear Thermal Hydraulics, Materials for Reactor Systems, Nuclear Chemical Engineering, Reactor Physics, Nuclear Safety Management, Nuclear Waste Management and Decommissioning;
Assessment of lab based work by report;
Assessment of literature review by report and oral presentation;
Project work by dissertation.

Dates of Examination

Introduction test (middle of Nov).
Written papers for other core modules (first week of summer term).
Dissertation oral by end of Spring term.
Dissertation by end of September.

Optics and Photonics

Additional Entry Requirements

Normally at least a Second Class Honours degree in the Physical Sciences, Mathematics or a relevant engineering discipline. Candidates with degrees in other subjects and appropriate experience may also be considered.

Curriculum

The following compulsory modules will be taken:

Autumn Term
Imaging
Lasers
Optical Measurement and Devices
Laboratory

Spring Term
Laboratory
Self-study project

The following optional modules will be taken:

Spring Term (Candidates choose from 80 hours worth of modules)
Laser Technology
Laser Optics
Non-linear Optics
Optical Fibres
Photonic Structures
Biomedical Optics
Optical Communications
Opto-electronic Components and Devices
Quantum Optics
Optical Displays
Optical Design
Optical Design Laboratory

Students will also undertake an individual research project on an approved topic and will submit a report thereon. For part-time students, this will be during the summer of their final year of study.

Students will be required to attend a series of workshops to enhance the development of their general research, personal and transferable skills.

Part-time Students

For students attending over two years: attendance at two compulsory lecture courses and 40 hours of optional lecture courses in Year 1, with the remaining courses undertaken during Year 2. The dissertation is undertaken, under regular guidance from a College supervisor, by arrangement at the student's place of employment.

Duration of Course of Study

Full-time:	One calendar year
Part-time:	Two calendar years

Examination

Three two to four hour written papers (which may be taken in parts).
Assessment of laboratory work by report.
Self-study project report and presentation.
Dissertation and presentation.

Dates of Examination

Written papers	January and April/May
Dissertation	By 15 September
Oral	By 28 September

For students taking the part-time course, the written examinations and coursework assessment will take place in the year in which the particular courses are taken; the project report assessment in the final year of study.

A student who has failed one or more of the written examinations may apply to the course director to be permitted to take their one permitted re-sit within the same academic year.

Petroleum Engineering

Additional Entry Requirements

A degree in engineering or science subjects.

Curriculum

The subjects to be studied are:

Main subjects
Reservoir engineering Production engineering
Drilling engineering Exploration sciences
Subsidiary subjects
Hydrocarbon thermodynamics Petroleum economics
Petrophysics Petroleum laws and regulations
Hydrocarbon processing Numerical analysis

In addition candidates are required to carry out a research project, which, subject to the approval of the course director, may involve a period of up to five months spent outside the College, during which regular contact will be maintained with the course tutor.

Duration of Course of Study

Full-time: One calendar year

Examination

Five or more written papers, amounting to at least 15 hours but not exceeding 21 hours, an oral and written report on the project and an oral examination at the examiners' discretion.

Dates of Examination

Written papers	January and May
Project report	Mid-September

A student who has failed one or more of the written examinations may apply to the course director to be permitted to take their one permitted re-sit within the same academic year.

Petroleum Geophysics

Additional Entry Requirements

An Upper Second Class Honours degree from a UK academic institution or an overseas equivalent.

Curriculum

The courses to be taken are:

Term 1
Introduction to Petroleum Geology
Rock Properties
Basic Petroleum Geophysics
Petroleum Engineering
Petroleum Geology
Seismic Techniques
Petrophysics
Geostatistics
Signal Processing and Inverse Theory
Wessex Basin Fieldtrip
Production Geoscience Group Project

Term 2
Advanced Seismic Acquisition and Survey Design
Advanced Seismic Data Processing and Imaging
Basin Analysis
Seismic Interpretation of Sedimentary Basins
Rock Physics
Quantitative Seismic Analysis and Inversion
Reservoir Characterisation
Near-Surface and Non-Seismic Geophysical Methods
Petroleum Economics
Petroleum Geophysics Group Project

Term 3
Summer Independent Project

Students will attend all formal lectures, problem classes, laboratory and computer exercises on a full-time, structured basis from October to March during the normal academic terms.

Two group exercises will be undertaken. The first involves an integrated study of the evaluation and development of part of an oil field (e.g. the Wytch Farm field in the UKCS). This interrelates separate subjects taught by informal lectures. The second involves processing or quantitative analysis of a seismic dataset.

After formal examinations at the end of April, students will work on individual research projects. These are submitted at the beginning of September and are examined both as a report and by oral presentation to an industrial audience in mid-September.

Duration of Course of Study

*Full-time***:** One calendar year

Examination

Five three-hour written papers on subjects covered during the course (Petroleum Geology and Perophysics; Exploration Geoscience; Petroleum Engineering; Petroleum Geophysics; Advanced Seismic Methods); assessment of laboratory reports; a Dissertation, Presentation and Poster relating to the Individual Research Project.

Dates of Examination

Written papers	April/May
Laboratory Reports	December/March
Dissertation, Presentation and Poster	September

A student who has failed one or more of the written examinations may apply to the course director to be permitted to take their one permitted re-sit within the same academic year.

Petroleum Geoscience

Additional Entry Requirements

A degree in geological or earth sciences.

Curriculum

All students must attend courses in the following areas:

Development geology and reservoir modelling
Seismic techniques
Petroleum structural geology
Petrophysics
Petroleum engineering
Geostatistics
Characterisation of fractured reservoirs
Applied sedimentology
Exploration and production geochemistry
Basin analysis
Seismic interpretation of sedimentary basins
Modelling of petroleum systems
Economics

Students will undertake two major fieldwork courses. There will also be two major group projects.

All students will undertake an individual project and submit a report thereon, of between 12,000 and 20,000 words in length. The project may involve a period of up to three months spent outside the College, during which contact will be maintained with the course tutor.

Duration of Course of Study

*Full-time***:** One calendar year

Examination
Five three-hour written papers; assessment of coursework and practical work; assessment of group projects; project report. An oral examination may be required at the discretion of the examiners.

Dates of Examination

Written papers	April/May
Group projects	December and February/March
Individual project	Mid-September
Oral examination	Late September

A student who has failed one or more of the written examinations may apply to the course director to be permitted to take their one permitted re-sit within the same academic year.

Physics

Additional Entry Requirements

Normally at least an Upper Second Class Honours degree from a UK university or overseas equivalent.

Curriculum

Students take all compulsory courses and must choose five optional courses. In addition, they undertake (a) a self study project on an agreed area of physics; (b) selected transferable skills workshops from the GSEPS list; and (c) a project on which they must submit a literature review and a dissertation.

Compulsory courses

- Advanced Classical Physics (unless already covered at Bachelors level, in which case one further option is taken).
- Advanced Mathematical Techniques.
- Research Skills training.

Optional courses (any five may be taken except that no more than two at Level 3 may be chosen: with the agreement of the Course Director up to three options may be selected from options offered in other MSc courses).

Undergraduate Level 3 Options (maximum two courses):

- Astrophysics
- Computational Physics
- Dynamical Systems and Chaos
- Foundations of Quantum Mechanics
- Group Theory
- Instrumentation
- Lasers, Optics and Holography
- Medical MRI and Ultrasound
- Plasma Physics
- Statistical Mechanics

Undergraduate Level 4 Options:

- Advanced Particle Physics
- Atmospheric Physics
- Biophysics of Nerve Cells and Networks
- Cosmology
- Device Physics
- General Relativity
- Laser Technology

- Optical Communications Physics
- Quantum Theory of Matter
- Quantum Field Theory
- Quantum Optics
- Research Interfaces
- Space Physics
- Unification

Duration of Course of Study

Full-time: One calendar year

Examination

Two-hour written papers on each of the compulsory and option courses.
A self study report and presentation.
A project literature review, presentation, dissertation and poster.

Dates of Examination

Written papers	January and May/June
Self Study Project (Report and Presentation)	December
Project Literature Review and Project Plan	April
Project Dissertation, Presentation and Poster	September

Plant Science and Biotechnology*

Additional Entry Requirements

Normally at least an Upper Second Class Honours degree in an appropriate science subject from a UK university or an overseas qualification of equivalent standard.

Curriculum

Two major components of the curriculum are: i) taught course and ii) research project.

The taught element is an intensive course to acquire essential background knowledge and practical skills, and promote critical research planning. Teaching will be based on lectures, tutorials, bioinformatics sessions and practicals. Major lecture modules will include: introduction to molecular and systems biology of plants; molecular mechanism of plant hormone action and responses to abiotic stress; root and shoot architecture, plant nutrition, flowering, systemic signalling; plant secondary metabolism, medicinal plants and use of plant products in medicine and pharmacology; biotic interactions: pathogens and pests; biofuels and bioenergy crops. Students will undertake a tutored dissertation and complete practical write-ups.

The taught course will be followed by a 6 month **research project** on a selected topic.

Duration of Course of Study

Full-time: One calendar year

Examination

Mid-term assessment
Two three-hour written papers covering core course subjects
Essay on a selected topic
Tutored dissertation (4,000 words)
Written practical reports
Two oral presentations on the research project
Project report (max 10,000 words) and oral examination

Dates of Examination

Mid-term assessment - November
Essays – December
Practical reports – December
Written papers - January
Tutored Dissertation - February
Project Presentations – April and August
Project report - Early September
Oral examination - September

*****Admissions to this course are suspended from entry in October 2010.

Preventive Cardiology

Additional Entry Requirements

Normally a medical degree or equivalent, or at least an Upper Second Class Honours degree in nursing, dietetics, physiotherapy or an appropriate basic science discipline

AND

Candidates must normally be registered health professionals (e.g. state registered nurse, dietitian, physiotherapist, pharmacist, physician) or Level 4 for the register for exercise professionals.

Curriculum

Students will study the principles of preventive cardiology and practical applications across hospital, community health care and leisure based settings. Students will study three core compulsory modules which will include subjects such as preventive cardiology theory and practice, research methods and reflective clinical practice. Students will also follow three optional modules chosen from the following fields: smoking cessation interventions; nutrition and weight management in CVD prevention; physical activity and exercise in CVD prevention; risk estimation; prevention and management of diabetes; medical management of blood pressure and lipids. Students with a nursing background may follow one of the optional modules offered from the MSc in Cardiorespiratory Nursing Programme.

In addition, all students will complete a dissertation on a topic of original research in preventive cardiology that will not normally exceed 8,000 words in length. All students will attend an oral examination on the project.

Duration of Course of Study

Full-time:	One calendar year
Part-time:	Two calendar years

Examination

Each module (including those delivered as blended learning) will be assessed by a combination of assessment types, including written papers and essays, case presentations, written reports, poster presentation or group debate. In addition, students develop a portfolio of reflective practice which is presented at the end of the course.
Dissertation (up to 8,000 words) and oral examination.

Dates of Examination

Written papers	January
Practical Assessments	January
Coursework	By continuous assessment
Dissertation and viva	By 21 September

For students taking the part-time course, the written and practical examinations and course work assessment will take place in January of the final year of study; the dissertation and viva will be assessed in the final year of study.

Pure Mathematics

Additional Entry Requirements

A first degree, normally of at least Upper Second Class Honours, in an approved subject.

Curriculum

Students will follow eight courses of which at least three must be chosen from core courses in the areas of analysis; topology, geometry and number theory; and algebra and combinatorics. The other five courses will comprise option courses in the same areas or in related subjects. No more than two courses, which must be from final year level, may be chosen from the curriculum for the MSci course.

With the permission of the course organiser and subject to timetabling constraints a student may select some option courses from an approved list of subjects offered by King's College London, Queen Mary University of London and the Taught Course Centre in Mathematical Sciences (TCC).

Each student will also carry out an individual research project and submit a report of 10,000 words thereon.

Duration of Course of Study

Full-time:	One calendar year
Part-time:	Two calendar years

Examination

Eight written papers totalling not less than 16 hours; coursework; a report on the project and an oral examination at the examiners' discretion. Students following the part-time course will take four written papers in the first year and four in the second year. Students wishing to take more than four courses in the first year may only do so with the approval of the Course Organiser.

Dates of Examination

Written papers	May
Coursework	Continuous assessment
Project report	By 23 September of the final year
Oral examination	September of the final year

Quality and Safety in Health Care

Additional Entry Qualifications

Normally a degree in medicine or an Upper Second Class Honours degree, or better, in a healthcare related subject or equivalent and three years' of experience in healthcare.

Curriculum

The course comprises two parts, a taught component and a research component. The taught component consists of seven core modules and one optional module which are taught in the first six terms, and will include lectures, workshops and tutorials. The research component normally takes place in Year two, during which time students undertake a research project drawn from the areas covered in the taught modules. The research project will normally be based within Imperial, but may be carried out at the student's own institution, during which regular contact would be maintained with the course tutor.

Duration of Course of Study

Part-time: Two calendar years

Examination

The taught part of the course will be examined by two three-hour written papers and by in-course assessment, including some or all of the following: essays and reports (2,000-2,500 words); oral and poster presentations. The research project will be examined by a written report (10,000 – 15,000 words). At the end of the year, students will be examined by *viva voce*.

Dates of Examination

Written papers	November and June, Year 2
Coursework	Continuous Assessment
Project report and *viva voce*	By 21 September, Year 2

Quantitative Biology

Additional Entry Requirements

Normally at least an Upper Second Class Honours degree in a Biological, Ecological, or Life Sciences-based subject or equivalent **and** an A level in Mathematics or equivalent. Candidates with mathematical, statistical or computational backgrounds will also be considered if they show evidence of an abiding interest in biology.

Curriculum

In the first two terms of the course, students take modules covering the following topics:

Primer in mathematical methods in biology; the evolution of genetic and ecological systems; a quantitative approach to co-evolutionary host-pathogen systems; models of cooperation; primer in statistical methods in biology; stochastic population dynamics; confronting mechanistic models of population dynamics with data; food webs: from static empirical to dynamic theoretical and integration.

In addition to the formal teaching, students are expected to attend weekly seminar series designed to complement their experience and expose them to a range of disciplines. After the taught part of the course, students undertake a research project on an advanced topic selected from portfolios of projects put forward by Imperial College staff in the biology and mathematics departments and outside collaborators. Most research projects will be conducted at an Imperial College campus, but in special circumstances the project may, with the agreement of the Course Directors, involve a period of up to six months spent outside the College, during which time regular contact must be maintained with the Course Director and with a within-College supervisor. Students will write up the project in the form of a dissertation which shall not normally exceed 10,000 words in length. A *viva voce* is held with the external examiner following the project.

Duration of Course of Study

Full-time: One calendar year

Examination

Three three-hour written examinations; a project report and *viva voce*; assessment of coursework, including an oral examination and a presentation of research results from the thesis.

Dates of Examination

Written papers:	One after term one, two after term two
Coursework	Continuous assessment
Project report	In week 50 of the course, date TBD

Quantum Fields and Fundamental Forces

Additional Entry Requirements
Normally a degree in Physics or Mathematics.

Curriculum
Students take all compulsory courses and must choose four optional courses. In addition, they undertake a project on which they must submit a dissertation.

Compulsory courses
Advanced quantum field theory
Quantum electrodynamics
Electro-weak unification

Optional courses (any four may be taken except that no more than two marked may be chosen)*
Topics in classical and quantum gravity
Supersymmetry
Cosmology and particle physics
Differential geometry
Gauge theories and lie algebras
Kac-Moody algebras and string theory
Special topics
Quantum mechanics III*
Cosmology*
Dynamical systems and chaos*
General relativity*
Group theory*
Quantum Information*

Duration of Course of Study

Full-time:	One calendar year
Part-time:	Two calendar years

Examination
Three two-hour written papers on the compulsory subjects.
Each optional subject will be examined by a two- or three-hour written paper or by an open examination paper to be answered in the student's own time within a specified time limit.
A project dissertation.
An oral examination at the examiners' discretion.
Students following the course part-time will normally take at least one of the compulsory papers and two others in each year and submit the project dissertation in the second year.

Dates of Examination

Written papers *Compulsory courses*	May/June
Written papers *Optional courses*	May/June
Project dissertation	To be submitted by 25 September

Reproductive and Developmental Biology

Additional Entry Requirements

A degree in a biomedical science, veterinary science or medicine.

Curriculum

The course will explore in depth the processes of normal human reproduction and development, as well as the linked abnormalities, from both scientific and clinical perspectives. Emphasis will be placed on understanding the basic mechanisms underlying reproduction and development.

Duration of Course of Study

Full-time: One calendar year

Examination

(a) Two three-hour written examinations and one four-hour data handling/practical examination.
(b) Assessment of course work.
(c) Assessment of the research project and an oral examination.

Students whose performance in the written examinations is unsatisfactory may be required to withdraw from the course.

Dates of Examination

(a) The written and data handling/practical examinations will be held in March.
(b) The project report must be submitted by the end of August.
(c) The oral examination will be held in September.

Risk Management and Financial Engineering

Additional Entrance Requirements

Applicants will be expected to have an Upper Second Class quantitative degree which has included a significant element of instruction in mathematics and statistics.

Curriculum

(a) *Compulsory courses*

Introduction to Accounting
Introduction to Finance
Ethics and Professional Standards in Finance
Visual Basic (VBA)
Financial Modelling
Financial Statistics
Markets and Securities
Mathematical Finance
The Finance Industry
Advanced Financial Statistics
Corporate Finance
Investments and Portfolio Management
Stochastic Calculus and Quantitative Portfolio Management

(b) *Four of the following electives*

Applied Corporate Finance
Banking
Structured Credit and Equity Products
Advanced Numerical Finance with C++
Advanced Options Theory
Hedge Funds
Advanced Portfolio Management
Credit Risk
Fixed Income Securities
International Finance
Introduction to Numerical finance with C++
Private Equity and Entrepreneurial Finance
Venture Capital Finance
Enterprise Risk Management

Further electives may be introduced later; not all electives will necessarily be offered each year.

(c) Students will also undertake one of the following:

An individual project on an approved topic
The Applied Financial Research taught course and an additional elective

Duration of Course of Study

Full-time: One calendar year (starting in September)

Examination

On-line tests for the Accounting, Introduction to Finance, Ethics and Professional Standards in and VBA courses, three-hour written papers for the remaining core courses and two-hour written papers for the electives (with the exception of two electives which are assessed by coursework only), assessment of coursework, project report or applied financial research report and an oral examination at the examiners' discretion.

Dates of Examination

On-Line Accounting	October
On-Line Introduction to Finance	October
On-Line VBA	May
On-Line Ethics	June
Written papers	December, March, June
Coursework	Continuous assessment
Project Report	August

A student who has failed one or more of the written examinations may apply to the Programme Director to be permitted to take their one permitted re-sit within the same academic year.

Science Communication

Additional Entry Requirements

A first degree in science, engineering or medicine. Graduates in other disciplines, with at least three years' relevant professional experience in the field of science communication, may also be considered. Evidence of potential to be a science communicator (through undertaking an aptitude assignment) will also be sought.

Curriculum

Students follow core courses in: science and its social contexts; the media representation of science; and introduction to practical communication.

Students follow three additional optional academic courses, drawn from a wider pool.

The options currently available are: narrative; documentary film; rhetoric of science; science in a fictional context; ethics in science and the media; scientific controversies and science policy; science and the child; science and the web.

Students also undertake, related to their academic programme, a short, small group project with an educational or artistic outcome.

In addition, students choose to undertake two practical options from a selection of five: print journalism; radio production; television production; museum studies; and website construction and design. In the latter part of the course students undertake a piece of dissertation research, on which they submit a written report with a guide length of 10,000 words. Students also undertake an internship or placement of four to six weeks' duration in a professional organisation concerned with communication and/or the media.

Duration of Course of Study

Full-time:	One calendar year
Part-time:	Two calendar years

Examination

Two three-hour written papers; assessment of academic and practical coursework; and a written report on a dissertation project.

Dates of Examination

Written papers	Beginning of the summer term
Academic coursework	Continuous assessment
Practical coursework	Continuous assessment
Dissertation report	By 25 September

Part-time students will take one written examination paper in the summer term of their first year and the other in the summer term of their second year. Their dissertation reports must be submitted by 25 September of their second year.

Science Media Production

Additional Entry Requirements

A first degree in science, engineering or medicine. Graduates in other disciplines, with at least three years' relevant professional experience in the field of media production, may also be considered. Evidence of potential to be a science media producer (through undertaking an aptitude assignment) will also be sought.

Curriculum

Students will follow core courses in the areas of: science and its social contexts; the history of communication in science and society; and the writing of scripts and stories as well as practical courses in the areas of spoken and written communication, television production and radio production. Students will also follow two optional courses chosen from a group which may include: documentary film; radio; television and new media industries; ethics, law and regulation in science and the media; sounds and signs and meanings in radio; and the visual representation of science in films, photography, graphics and illustrations.

Students will follow an internship programme of four to six weeks with a media company.

In addition, all students will undertake a production project, which must be either a 15 minute television programme or a 30 minute radio programme, and write a critique of 4,000 words thereon.

Duration of Course of Study

Full-time:	One calendar year
Part-time:	Two calendar years

Examination

Two three-hour written papers; assessment of coursework; assessment of practical work; production project and the critique thereon; and an oral examination at the discretion of the examiners.

Dates of Examination

Written papers	May/June
Coursework	Continuous assessment
Practical coursework	Continuous assessment
Project and critique	By 25 September
Oral examination	By 30 September

Scientific, Technical and Medical Translation with Translation Technology

Additional Entry Requirements

Normally a degree of Upper Second Class Honours or better in a science, technological or medical subject and proven linguistic ability in one of the language pairs offered by the College in a given year.

Graduates holding a degree of Upper Second Class Honours or better in a language subject, and with a background in science or technology, may be considered as may graduates in other disciplines with a strong language and science and/or technology background. Candidates in these categories will be considered by the appropriate College committees in all cases.

Curriculum

Students will follow a core curriculum including topics in the area of the study of language and linguistics; information technology; languages and translation; translating practice; and research tools and techniques. Students will also choose three optional courses in the areas of translation theories; the history of translation; publishing skills; translation and automation; subtitling; dubbing and voiceover; and accessibility to the media.

In addition, students will undertake a dissertation. This will normally be undertaken at the College but may, with the agreement of the course tutor, involve a period of up to four months spent outside the College, under the Erasmus scheme, during which regular contact will be maintained with the course tutor. In such instances, a co-supervisor will be appointed at the external location.

Duration of Course of Study

Full-time:	One calendar year
Part-time:	Two calendar years

Examination

Written papers on the compulsory courses totalling six hours; coursework consisting of one essay and oral presentation or, if appropriate, projects for each of the core and optional courses; translation exercises; a dissertation; and an oral examination at the discretion of the examiners.

Dates of Examination

	Full-time	*Part-time*
Written papers	May, June	May, June of the year the course is taken
Coursework	Continuous assessment	Continuous assessment
Report	By mid September	By mid September of the final year
Oral examination	September	September of the final year

Shock Physics

Additional Entry Requirements

Normally at least an Upper Second Class Honours degree in Physics or other physical science or engineering subject with a strong mathematical and theoretical content. Candidates with degrees in other subjects and appropriate experience may also be considered.

Curriculum

The following compulsory modules will be taken:

Autumn Term
Introduction to Shock Physics
Fundamentals of Shock Physics
Shock Waves in Context
Hydrodynamics and Shocks
Literature review project

Spring Term
Current Trends in Shock Studies
Explosives Technology course (at Cranfield University)
Computational skills and data modelling training
Project plan
Plus an optional course from elsewhere in the College

In each term students will be required to attend a series of workshops to enhance the development of their general research, personal and transferable skills.

Summer Term
Students will complete their research topic and will submit a report and presentation thereon. This may, subject to the agreement of the course director, involve a period of up to six months spent outside the College, during which time regular contact must be maintained with the course director.

Duration of Course of Study

One calendar year (full time) or two calendar years (part time)

Examination

Assessment of lecture courses by examination
Assessment of Literature Review by report and viva
Assessment of computational classes by assessed problem sheets
Assessment of Explosives course by examination
Project work by dissertation and presentation

Students following the course part-time must take examinations in the subjects that they have studied that year and will normally submit their dissertation in the final year of study.

Dates of Examination

Written papers in January and May/June
Dissertation by 26 September
Oral by 28 September

Soil Mechanics

Additional Entry Requirements

Normally at least an Upper Second Class Honours degree in Civil or Structural Engineering.

Candidates will find industrial experience prior to starting the course of benefit to their studies. Candidates with degrees in geology, mathematics, or other natural sciences and engineering, and who possess appropriate experience, may also be considered.

Curriculum

The following compulsory modules will be taken:

Consolidation and Seepage
Ground Profiles and Ground Investigation
Analysis and Constitutive Models
Laboratory and Field Techniques
Strength and Deformation
Engineering Geology of Soils and Rocks
Rock Strength and Failure
Earth Pressures
Geotechnical Processes
Foundations
Stability of Slopes
Embankments and Earthworks
Applied Engineering Geology Coursework
Advanced Soil Properties
Partly Saturated Behaviour
Advanced Constitutive Modelling
Laboratory Practical Classes

Students will also undertake an individual research project on an approved topic and will submit a formal record of the work as a dissertation.

Fieldwork is an essential component of the course. There will be three field visits during the course, each of two to seven days' duration in the UK and mainland Europe.

Part-time Students

Attendance of Autumn term in Year 1 and Spring term in Year 2. The dissertation is undertaken, under regular guidance from a College supervisor, by private study or by arrangement at the student's place of employment.

Duration of Course of Study

Full-time:	One calendar year
Part-time:	Two calendar years

Examination

A total of 12-20 hours of written examinations
Assessment of coursework including field and laboratory work
Dissertation
Oral examination at the discretion of the examiners

Dates of Examination

Written papers	January and/or April/May
Dissertation	By 1 September
Oral	April/May and/or September

For students taking the part-time course, the written examinations and coursework assessment will take place in the academic year in which the particular courses are taken; the dissertation will be assessed in the final year of study.

Soil Mechanics and Business Management

Additional Entry Requirements

Normally at least an Upper Second Class Honours degree in Civil or Structural Engineering.
Candidates will find industrial experience prior to starting the course of benefit to their studies. Candidates with degrees in geology, mathematics, or other natural sciences and engineering, and who possess appropriate experience, may also be considered.

Curriculum

The following compulsory modules will be taken:

Consolidation and Seepage
Ground Profiles and Ground Investigation
Analysis and Constitutive Models
Laboratory and Field Techniques
Strength and Deformation
Engineering Geology of Soils and Rocks
Earth Pressures
Geotechnical Processes
Foundations
Stability of Slopes
Embankments and Earthworks
Applied Engineering Geology Coursework
Laboratory Practical Classes
Business Management I, II, III, IV

Students will also undertake an individual research project on an approved topic and will submit a formal record of the work as a dissertation.

Fieldwork is an essential component of the course. There will be three field visits during the course, each of two to seven days' duration in the UK and mainland Europe.

Part-time Students

Attendance of Autumn term in Year 1 and Spring term in Year 2. The dissertation is undertaken, under regular guidance from a College supervisor, by private study or by arrangement at the student's place of employment.

Duration of Course of Study

Full-time:	One calendar year
Part-time:	Two calendar years

Examination

A total of 12-20 hours of written examinations
Assessment of coursework including field and laboratory work
Dissertation
Oral examination at the discretion of the examiners

Dates of Examination

Written paper	January and/or April/May
Dissertation	By 1 September
Oral	April/May and/or September

For students taking the part-time course, the written examinations and coursework assessment will take place in the academic year in which the particular courses are taken; the dissertation will be assessed in the final year of study.

Soil Mechanics and Engineering Seismology

Additional Entry Requirements

Normally at least an Upper Second Class Honours degree in Civil or Structural Engineering.
Candidates will find industrial experience prior to starting the course of benefit to their studies. Candidates with degrees in geology, mathematics, or other natural sciences and engineering, and who possess appropriate experience, may also be considered.

Curriculum

The following compulsory modules will be taken:

Consolidation and Seepage
Ground Profiles and Ground Investigation
Analysis and Constitutive Models
Strength and Deformation
Basic Dynamics and Analysis of Strong Motion Data
Engineering Seismology
Earth Pressures
Foundations
Stability of Slopes
Embankments and Earthworks
Laboratory and Field Techniques
Applied Engineering Geology Coursework
Advanced Soil Properties
Earthquake Geotechnical Engineering
Laboratory Practical Classes

Students will also undertake an individual research project on an approved topic and will submit a formal record of the work as a dissertation.

Fieldwork is an essential component of the course. There will be three field visits during the course, each of two to seven days' duration in the UK and mainland Europe.

Part-time Students

Attendance of Autumn term in Year 1 and Spring term in Year 2. The dissertation is undertaken, under regular guidance from a College supervisor, by private study or by arrangement at the student's place of employment.

Duration of Course of Study

Full-time: One calendar year
Part-time: Two calendar years

Examination

A total of 12-20 hours of written examinations
Assessment of coursework including field and laboratory work
Dissertation
Oral examination at the discretion of the examiners

Dates of Examination

Written papers	January and/or April/May
Dissertation	By 1 September
Oral	April/May and/or September

For students taking the part-time course, the written examinations and coursework assessment will take place in the academic year in which the particular courses are taken; the dissertation will be assessed in the final year of study.

Soil Mechanics and Environmental Geotechnics

Additional Entry Requirements

Normally at least an Upper Second Class Honours degree in Civil or Structural Engineering. Candidates will find industrial experience prior to starting the course of benefit to their studies. Candidates with degrees in geology, mathematics, or other natural sciences and engineering, and who possess appropriate experience, may also be considered.

Curriculum

The following compulsory modules will be taken:

Consolidation and Seepage
Ground Profiles and Ground Investigation
Engineering Geology of Soils and Rocks
Analysis and Constitutive Models
Strength and Deformation
Waste Management and Landfill Engineering
Earth Pressures
Foundations
Stability of Slopes
Geotechnical Processes
Embankments and Earthworks
Partly Saturated Behaviour
Laboratory and Field Techniques
Applied Engineering Geology Coursework
Contaminated Land and Groundwater
Laboratory Practical Classes

Students will also undertake an individual research project on an approved topic and will submit a formal record of the work as a dissertation.

Fieldwork is an essential component of the course. There will be three field visits during the course, each of two to seven days' duration in the UK and mainland Europe.

Part-time Students

Attendance of Autumn term in Year 1 and Spring term in Year 2. The dissertation is undertaken, under regular guidance from a College supervisor, by private study or by arrangement at the student's place of employment.

Duration of Course of Study

Full-time:	One calendar year
Part-time:	Two calendar years

Examination

A total of 12-20 hours of written examinations
Assessment of coursework including field and laboratory work
Dissertation
Oral examination at the discretion of the examiners

Dates of Examination

Written papers	January and/or April/May
Dissertation	By 1 September
Oral	April/May and/or September

For students taking the part-time course, the written examinations and coursework assessment will take place in the academic year in which the particular courses are taken; the dissertation will be assessed in the final year of study.

Soil Mechanics and Sustainable Development

Additional Entry Requirements

Normally at least an Upper Second Class Honours degree in Civil or Structural Engineering. Candidates will find industrial experience prior to starting the course of benefit to their studies. Candidates with degrees in geology, mathematics, or other natural sciences and engineering, and who possess appropriate experience, may also be considered.

Curriculum

The following compulsory modules will be taken:

Consolidation and Seepage
Ground Profiles and Ground Investigation
Analysis and Constitutive Models
Strength and Deformation
Engineering Geology of Soils and Rocks
Applied Engineering Geology Coursework
Earth Pressures
Geotechnical Processes
Foundations
Stability of Slopes
Embankments and Earthworks
Laboratory and Field Techniques
Laboratory Practical Work
Sustainable Development I and II

Students will also undertake an individual research project on an approved topic and will submit a formal record of the work as a dissertation.

Fieldwork is an essential component of the course. There will be three field visits during the course, each of two to seven days' duration in the UK and mainland Europe.

Part-time Students

Attendance of Autumn term in Year 1 and Spring term in Year 2. The dissertation is undertaken, under regular guidance from a College supervisor, by private study or by arrangement at the student's place of employment.

Duration of Course of Study

Full-time:	One calendar year
Part-time:	Two calendar years

Examination

A total of 12-20 hours of written examinations
Assessment of coursework including field and laboratory work
Dissertation
Oral examination at the discretion of the examiners

Dates of Examination

Written papers	January and/or April/May
Dissertation	By 1 September
Oral	April/May and/or September

For students taking the part-time course, the written examinations and coursework assessment will take place in the academic year in which the particular courses are taken; the dissertation will be assessed in the final year of study.

Structural Steel Design

Additional Entry Requirements

Normally at least an Upper Second Class Honours degree in Civil, Mechanical, Structural or Aeronautical Engineering. Candidates with degrees in other branches of engineering or the physical sciences, Metallurgy or Materials Science and appropriate experience may also be considered.

Curriculum

Candidates must undertake six modules in each of the Autumn and Spring terms. Business Management and Sustainable Development count as two modules in each term.

The following compulsory modules will be taken:

Autumn Term
Structural Steel Technology
Steel Components
Structural Stability
Finite Element Analysis
Structural Analysis

Spring Term
Design of Steel Buildings

The following elective modules will be taken:

Autumn Term
Structural Dynamics
Business Management I or Sustainable Development I

Spring Term
Plated Structures
Design of Bridges
Structural Reliability Theory
Nonlinear Structural Analysis*
Seismic Design of Steel Structures*
Cold-formed Steel Design
Business Management II or Sustainable Development II

* Not with Business Management or Sustainable Development

Students will undertake an individual project on an approved topic and will submit a report thereon.

There is a compulsory field trip within the UK over the Easter break.

Part-time Students

For students attending over two years: attendance of Autumn term in Year 1 and Spring term in Year 2. Alternatively, students may attend on average two days per week in Year 1 and one day per week in Year 2.

For students attending over three years: attendance of on average one day per week in each of the years.

The dissertation is undertaken, under regular guidance from a College supervisor, by private study or by arrangement at the student's place of employment.

Duration of Course of Study

Full-time:	One calendar year
Part-time:	Two or three calendar years

Examination

24 hours' worth of examinations through the year
Assessment of coursework in individual modules
Option for: Major Design Project or Research Dissertation
Oral examination at the discretion of the examiners

Dates of Examination

Written papers	January and April/May
End-of-year project	By first week in September
Oral examination	September

For students taking the part-time course, the written examinations and coursework assessment will take place in the year in which the particular courses are taken; the project report assessment in the final year of study.

Depending on the options chosen students will graduate with the MSc in Structural Steel Design or the MSc in Structural Steel Design and Business Management or the MSc in Structural Steel Design and Sustainable Development.

Surgical Science

Additional Entry Requirements

A medical qualification and evidence of postgraduate experience in surgery.

Curriculum

The course will consist of a series of lectures and seminars in which all the candidates will be given instruction in the basic sciences that apply to the whole of Surgery (stem programme). During this period, the candidates will register with one of the main topic areas (modules) in Surgery and will devote their time to study in this area, which will include a particular aspect of clinical or applied research.

The stem programme will consist of a series of tutorials in infectious diseases, principles of management of intensive care (including immediate care), surgical immunology, principles of molecular biology as applied to surgery, the principles of medical statistics, the basics of computing, imaging and general principles of laboratory practice. Modules will be offered in General Surgery, Cardiovascular Surgery, Urology, and Orthopaedic and Accident Surgery.

Duration of Course of Study

Full-time:	One calendar year
Part-time:	Two calendar years

Examination

Assessment of coursework.
A paper on problem-solving, lasting two hours and made up of 30 questions, with questions common to the stem programme.
A two-hour written essay-style paper related to the principles of surgical science and practice.
A 20 minute clinical *viva* related to the speciality the candidate has selected.
One *viva* session on the principles of surgical science and practice, the latter related to the candidate's specialism. Candidates will be given a surgical paper in advance to discuss critically during the *viva voce*.
Assessment of research project (a *viva* on the project report will normally be required for each candidate).

Dates of Examination

Written examinations will be held in May, clinical and oral examinations will be held in June. The project report will be submitted in August and the dissertation viva/oral in September.

For students taking the course part-time, written, clinical and oral examinations will be held in May and June of the second year. The project report will be submitted in August and dissertation viva/oral in September in the second year.

Surgical Technology

Additional Entry Requirements

Normally a degree in medicine or in an appropriate science subject. Medical graduates will be required to have at least one year's clinical experience. Science graduates will be required to have at least one year's experience in an area related to surgery or surgical equipment technology. All students will be required to be confident in basic computer use.

Curriculum

Students will study seven compulsory core modules: introductory module; endoscopy and new technology; information technology; biomaterials and biomechanics; energy sources and imaging; artificial organs and life support; research module; and will study one further module chosen from a number of supplementary modules available from other departments. Students will also be expected to undertake self-directed learning and complete assignments throughout the course via the Web. In addition, students will undertake a dissertation in the form of a research/literature project.

Duration of Course of Study

Full-time:	One calendar year
Part-time:	Two calendar years

Examination

Modules will be assessed by a combination of written essay, coursework and web-based assignments at the end of each module. There will be a three-hour written examination at the end of the course. In addition, students will write a dissertation of 10,000-15,000 words, followed by an oral examination.

Dates of Examination

Individual module assessment	on completion of the module
Written examination	September
Dissertation	by 25 September
Oral examination	September

For students taking the course part-time, individual module assessment will take place on completion of the module. The written examination, submission of the dissertation and the oral examination will take place by 25 September of the second year.

Sustainable Energy Futures

Additional Entry Requirements

A good first degree (equivalent to Upper Second Class Honours degree) in a numerate discipline (engineering or physical sciences) is normally required. Consideration may also be given to excellent applicants with degrees in life sciences and economics, where this included an adequate component of mathematics, or candidates with extensive relevant post-degree experience.

Curriculum

Students are required to follow:

(a) The following compulsory modules:
Energy Systems Technology
Methods for the Analysis of Energy Systems
Energy Economics and Policy

(b) A Seminars Course

(c) Five modules from a selection including:
Urban Energy Systems
Clean Fossil Fuels
Low Carbon Technologies
Energy Storage and Transmission
Sustainable Transport
Selected Topics in Sustainable Energy
Entrepreneurship in Renewable Energy

(d) Students are required to participate in a number of Transferable Skills workshops.

(e) Students are required to undertake a research project. This will include completing a critical literature survey report, an oral presentation based on the interim results and a written final dissertation. To ensure interdisciplinarity, each project will have two supervisors from distinct departments. Regular contact will be made with the supervisors during the project.

Duration of Course of Study

Full-time: One calendar year

Examination

Students must complete all course requirements and pass separately the course and research assessment components.

1. The Seminars Course will be pass/fail, with a pass requiring mandatory attendance to all seminars. Each lecture module (except the Seminars Course) to be assessed by an unseen examination paper (2 hour paper for compulsory modules, 1.5 hour for optional modules). (An aggregate exam mark will be calculated using a relative weight of 1 for optional courses, 1.5 for compulsory courses).

2. The research component will comprise a 10% weight for the literature survey report, 10% for the interim research presentation and 80% for the final dissertation.

Dates of Examination

Written papers	January April
Research Project	Literature review: February Oral presentation: June Final Dissertation: By mid-September

Theory and Simulation of Materials

Additional Entry Requirements

Normally at least a First Class Honours degree in Physics or another discipline in the Physical Sciences or Engineering with a strong mathematical content.

Curriculum

Autumn Term
The following compulsory modules will be taken:

Mathematics for Theory of Materials
Transformations of Matter
Equilibrium in Materials
Electronic Structure of Materials

Spring Term
The following compulsory modules will be taken:

Classical Field Theory of Materials
Methods of Simulating Materials

Two options will be taken from a selection

Summer Term
Students will undertake a research project and will submit a report thereon.

Duration of Course of Study

Full-time: One calendar year

Examination
Twelve to Sixteen hours of written papers.
Continuous assessment of problem sets, computational exercises and computational mini-projects.
Project work by dissertation and presentation.

Dates of Examination
One written paper in January (Mathematics for Theory of Materials)
Remaining written papers in May
Dissertation by 26 September
Oral by 28 September

Transport (joint course with UCL)

Additional Entry Requirements

Normally at least an Upper Second Class Honours degree or approved equivalent qualification in any subject relevant to transport.
Relevant professional experience would be an advantage.

Curriculum

(a) The following subjects will be studied by all students on the course:

1. Transport and its context
2. Quantitative methods
3. Transport engineering and operations
4. Transport economics
5. Transport demand and its modelling
6. Transport Policy

(b) In addition to the common modules, students will be required to study four modules selected from a range of options such as:

7. Highway engineering
8. Road traffic theory and its application
9. Public transport
10. Transport safety
11. Quantitative techniques for transport engineering and planning
12. Transport in developing countries
13. Transport infrastructure project management
14. Advanced transport modelling
15. Understanding and modelling travel behaviour
16. Transport and the environment
17. Transport telematics
18. Railway policy, management and engineering
19. Design of accessible transport systems
20. Freight transport
21. Asset management, project planning and maintenance
22. Design of roads, rail, bridges, tunnels and embankments
23. Air traffic management

(c) During the course students will carry out design or field exercises individually or collectively.

(d) Each student will be required to select an appropriate subject for an individual study and report to be completed in the latter part of the course; this may, subject to the course director's approval, involve a period of up to three months spent outside the College, during which regular contact will be maintained with the course tutor.

Transport and Business Management
Transport and Sustainable Development

Students undertaking the above programmes of study will undertake the following core Transport modules

T1, T2, T4, T5

And two modules from the list of elective modules in addition to the core Business Management or Sustainable Development modules, as appropriate.

Duration of Course of Study

Full-time:	One calendar year
Part-time:	Two or three calendar years

Examination

Students taking the Transport course sit five two-hour written papers on the common modules, four two-hour written papers on the optional modules (each of which may be replaced by a design study or a case study or a long essay), coursework assessment and a project report.

Students taking the Transport with Business Management course sit three two-hour written papers on the common transport modules, two two-hour papers in the business management modules and two two-hour written papers on the optional transport modules (each of which may be replaced by a design study or a case study or a long essay), coursework assessment and a project report.

Students taking the Transport with Sustainable Development course sit three two-hour written papers on the common transport modules, one three-hour paper in the sustainable development modules and two two-hour written papers on the optional transport modules (each of which may be replaced by a design study or a case study or a long essay), coursework assessment and a project report.

For students taking the part-time course, the written examinations and coursework assessment will take place in the year in which the particular courses are taken; the project report assessment in the final year of study.

A candidate following the part-time course who fails in the written examination papers and/or the coursework assessment may at the examiners' discretion proceed with the course. The candidate will then be required to re-enter all the written examination papers and submit the coursework for re-assessment in the final year of study unless at the examiners' discretion exempted from either part in which the candidate was successful.

Dates of Examination

Written papers	April-May
Report	By 15 September

Depending on the options chosen students will graduate with the MSc in Transport or the MSc in Transport and Business Management or the MSc in Transport and Sustainable Development.

Master of Research (MRes)

Advanced Computing

Additional Entry Requirements

Normally a First Class Honours degree in Computer Science or in Mathematics with a substantial computing element.

Curriculum

The course consists of taught lecture modules and individual mini-projects in the Autumn and Spring terms, and a substantial project undertaken in the period from May to September. The project is expected to contain some element of original work.

The course comprises the equivalent of nine modules, including four taught options, two mini-projects (each equivalent to two modules) and a critical reading course. Students should also attend a minimum of four research skills courses. The substantial project includes a literature survey in the Spring term.

The taught options cover a range of options organised within six main areas of specialisation:

Logic and artificial intelligence
High performance computing
Mathematical computing
Parallel and distributed systems
Software engineering
Computational management

A list of the available taught options and their pre-requisites will be published by the Department from time to time.

Duration of Course of Study

Full-time: One calendar year

Examination

Unseen written papers totalling at least six hours but not exceeding 10 hours
Assignments and open book examinations where appropriate
Assessment of coursework
Report and presentation of each mini-project
A dissertation on the individual project
An oral examination at the examiners' discretion

Dates of Examination

Written papers	April/May
Report	Submitted by 25 September

Biochemical Research

Additional Entry Requirements

Normally an Upper Second Class Honours degree, or better, in Biochemistry or a related subject.

Curriculum

Students will undertake three individual research projects, each of 13 weeks' duration, and will write a report and give a presentation on each, followed by an oral examination. In addition, students will follow a course of lectures chosen from the areas of Cell Signalling and Protein Sorting, Damage and Repair in Biological Systems, Macromolecules in 3D, Genetics and Genomics, Neurochemistry, Mechanisms of Gene Expression, Medical Glycobiology, Bioanalytical Technology, Molecular Neurobiology, Molecular Basis of Disease, Molecular Basis of Development, Bioreactors and Bioprocessing Technology, Biochemical Pharmacology and Drug Action, Protein Engineering and Drug Design, Molecular Basis of Infection and Molecular Parasitology. Students will also attend seminars appropriate to their individual needs and receive training in specific research techniques. Courses in professional and transferable skills will also be taken.

Duration of Course of Study

Full-time: One calendar year

Examination

A written report (approximately 7,000 words) and an oral presentation on each of the three projects and a *viva voce* examining the taught part of the course and the project work.

Dates of Examination

Report	January, May, and the final report by 25 September
Oral presentation	January, May, September
Viva voce	September

Bioimaging Sciences

Additional Entry Requirements

Normally an Upper Second Class Honours degree or better in a physical sciences-based subject. Candidates with degrees in other sciences and/or appropriate experience may also be considered.

Curriculum

(a) Students are required to follow six lecture modules to be chosen from the following:

Chemistry of Imaging
Positron Emission Tomography (PET)
Magnetic Resonance Imaging (MRI)
Optical Imaging
Image Computation
Ultrasound and Microwave Imaging
Anatomy and Physiology
Pharmacology of Imaging

(b) Students are required to write a literature review on an imaging-related topic, during which regular contact will be made with the supervisor.

(c) Students are required to undertake a short 'group project' via supervised workshops.

(d) Students are required to undertake a research project and prepare a final report on the project, during which regular contact will be made with the project supervisors. Students will also give an oral presentation based on the project work.

Duration of Course of Study

Full-time: One calendar year

Examination

Lecture modules to be assessed by two three-hour unseen examination papers.
Literature review (5,000 – 10,000 words in length).
Assessment of group project work.
Report on individual research project and oral presentation.

Dates of Examination

Written papers	January
Literature review	Mid-December
Group project work	Mid-February
Project report	Early September
Oral presentation	Late September

Biomedical Physical Chemistry

Additional Entry Requirements

Normally a degree in a physical science subject.

Curriculum

Students will follow courses in the areas of bioinformatics and structural genomics; macromolecular structure and dynamics; chemical mechanisms in the life sciences; protein engineering and design; and bioanalytical science and technology; and in transferable skills subjects such as safety awareness, intellectual property management, time and project management and presentation and communication skills. They will also undertake a literature survey and write a report thereon.

There will also be a series of practical demonstrations organised and delivered jointly with relevant companies.

In addition students will undertake an individual research project throughout the course and submit a dissertation thereon.

Duration of Course of Study

Full-time: One calendar year.

Examination

A literature survey, two three-hour written papers, coursework including a computational practical and a laboratory practical, dissertation and oral examination on the research project.

Dates of Examination

Literature Survey	December
Written papers	January
Coursework	Continuous assessment
Dissertation	By 10 September
Oral	By 23 September

Biomedical Research

Additional Entry Requirements

Normally an Upper Second Class Honours degree, or better, in an appropriate science subject.

Curriculum

Students will undertake two individual research projects, each of 20 weeks' duration, selected from a range of research areas within one of the four different streams that run within the course: (i) the Biomedical Research (BMR) stream; (ii) the Microbial Pathogenesis stream; (iii) the Cardiovascular Science, Technology and Medicine (CSTEM) Stream; and (iv) the Personalised Healthcare stream. The format of the streams and assessment is the same for all students. Students will undertake a literature survey to assess the research area and will write-up both projects, one in the form of a written report and one in the form of a scientific paper. On completion of the first project, students will present their research as a poster, and on completion of the second project, students will present their research as an oral presentation. In addition, students will follow a core programme which will include a lecture series to introduce research areas and fundamental techniques, journal discussion seminars, research seminars from invited speakers and training in research methods. Students will additionally complete a grant writing exercise as part of the core programme.

Duration of Course of Study

Full-time: One calendar year

Examination

A written report (8,000 words) and a poster presentation of the first project, a written report (in the form of a scientific paper) and an oral presentation of the second project, a grant writing exercise and a *viva voce* examining the core programme and the project work.

Dates of Examination

Written report	March, September
Grant writing exercise	May
Poster presentation	March
Oral presentation	September
Viva voce	September

Students who successfully complete the Biomedical Research stream will be awarded the MRes in Biomedical Research.

Students who successfully complete the Cardiovascular Science, Technology and Medicine stream will be awarded the MRes in Biomedical Research – Cardiovascular Science, Technology and Medicine.

Students who successfully complete the Microbial Pathogenesis stream will be awarded the MRes in Biomedical Research – Microbial Pathogenesis.

Students who successfully complete the Personalised Healthcare stream will be awarded to MRes in Biomedical Research – Personalised Healthcare.

Biosytematics

Additional Entry Requirements

Normally an Upper Second Class Honours degree, or better, in a science subject.

Curriculum

Students will undertake three individual research projects, each of 12 weeks' duration, and each selected from three categories of topics. At least one will be carried out at Imperial College and one at the Natural History Museum.

Students will write a report and give a presentation on each project, followed by an oral examination. Students will also follow a programme of key lectures which will include an introduction to the principles of phylogeny reconstruction; the principles of taxonomy; a primer to molecular biology; bioinformatics concepts and tools; an induction to morphometrics; lectures on species and speciation; macroevolution; and fundamentals of phylogenetics. In addition students will attend seminars appropriate to their individual needs and receive training in specific research techniques. Courses in professional and transferable skills will also be taken.

Duration of Course of Study

Full-time: One calendar year

Examination

A written report (approximately 3,000 words), an oral presentation on each of the three projects and a *viva voce* examining the taught part of the course and the project work.

Dates of Examination

Report	January, April, July
Oral presentation	January, April, July
Viva voce	September

Cancer Biology

Additional Entry Requirements

Normally an Upper Second Class Honours degree, or better, in an appropriate medical or science subject.

Curriculum

Students will undertake two individual research projects, each of 19 weeks' duration. Both projects will normally be based in the Department of Surgery and Cancer or related laboratories within Imperial. One of the projects may, with the agreement of the Course Director, be based in a laboratory outside the College, during which time regular contact must be maintained with the Course Director. In such instances, a co-supervisor will be appointed at the external location. The research projects will include a literature survey to assess the research area and presentation of seminars on the research. Students will write-up both projects in the form of a scientific paper. In addition, students will follow a core programme which will include a lecture series to introduce research areas and fundamental techniques, training sessions for transferable skills, journal discussion seminars, research seminars from invited speakers and training in research methods.

Duration of Course of Study

Full-time: One calendar year

Examination

A written report (5,000 words), in the form of a scientific paper, and *viva* examination on each of the two research projects, continuous assessment examining the core programme and a final *viva voce* covering both research projects.

Dates of Examination

Coursework	Continuous assessment
Written report and viva examination	By 25 March and 25 September
Viva voce	September

Chemical Biology of Health and Disease

Additional Entry Requirements

Normally an Upper Second Class Honours degree or better in a physical sciences-based subject.

Curriculum

Students will undertake core taught courses, which cover topics such as: Introduction to Cell Biology, Systems and Chemical Biology, Analytical Tools and Techniques, Physical Techniques in Biology, Molecular Basis of Cancer, Theoretical Approaches to Biology, Imaging in Chemistry and Biology. They will also make assessed presentations at group learning seminars. Assessed Journal Club sessions are also attended in the second term.

A literature report and research proposal will be written at the end of the first term and students will carry out an individual research project throughout the course, submitting a research thesis and presenting their research findings at a one-day MRes Conference in September. Students will also sit an oral viva on their research project.

Duration of Course of Study

Full-time: One calendar year.

Examination

A literature report, two written examination papers, group learning seminars, journal club, research thesis and oral examination on the research project.

Dates of Examination

Literature report - by December
Group Learning Seminars – November to December
Written examination papers - January
Journal Club – Febuary to April
Research Thesis – by early September
Oral vivas – by mid September

Clinical Research

Additional Entry Requirements

For the Cellular Pathology and Translational Medicine pathways: normally a degree in Medicine or at least an Upper Second Class Honours in a life science, or equivalent.

For the Clinical Research Design and Management pathway: normally an Upper Second Class Honours degree or above in nursing, pharmacy or a similar health science. Exceptionally, students with a diploma with substantial work experience will also be considered. Any such applicants will be subject to a special qualifying examination. EU and overseas applicants will be required to demonstrate that they are allowed to practise as nurses or allied healthcare professionals in the UK.

Curriculum

The course provides training in and practical experience of designing, implementing, and reporting clinical studies. Students will follow a programme of six taught modules relevant to their pathway in addition to a clinical research project.

Research projects will be identified in the first month of the programme and will normally be carried out on the Hammersmith Campus, but arrangements will be made for students based at other hospitals to undertake their projects at their home institution. In such instances, a co-supervisor will be appointed at the external location and regular contact will be maintained with the course tutor.

Duration of Course of Study

Full-time: One calendar year
Part-time: Two calendar years

Examination

The taught courses will be examined by a variety of assessment methods. The research project will be examined by means of a written thesis and an oral examination.

Dates of Examination

Written examinations	December and July
Written thesis	by the end of the first week of September in the final year of the programme
Oral examination	by the last week of September in the final year of the programme

Students who successfully complete the Cellular Pathology pathway will be awarded the MRes in Cellular Pathology.

Students who successfully complete the Clinical Research Design and Management pathway will be awarded the MRes in Clinical Research Design and Management.

Students who successfully complete the Translational Medicine pathway will be awarded the MRes in Translational Medicine.

The pathways do not have optional modules. There is a prescribed route through each pathway and students who do not complete all modules required for the pathway will not be eligible for the award.

Controlled Quantum Dynamics

Additional Entry Requirements

The minimum qualification for admission will normally be a First Class Honours degree in Physics or a relevant scientific discipline from a UK academic institution or an equivalent overseas qualification.

Curriculum

The following compulsory modules will be taken:

Autumn Term
Mathematical and Computational Methods, LabView and Instrumentation
Quantum Information Theory
QuantumOptics

Plus one relevant course from another Masters level programme in the Department of Physics.

Spring Term
Quantum Physics and Chemistry of Cold Matter
Experimental Realisations of Controlled Quantum Dynamics
Advanced Quantum Information Theory

Students will undertake an outreach project, where they present a lecture on research undertaken in the Doctoral Training Centre in Controlled Quantum Dynamics.

Summer Term + Summer period
Students will undertake their research project and will submit a report thereon.

Duration of Course of Study

Full-time: One calendar year

Examination

Assessment of lecture courses by a mixture of coursework and examinations.
Assessment of Outreach project by presentation.
Assessment of project work by dissertation and presentation.

Dates of Examination

Written papers	January and May
Dissertation	by 26 September
Oral	by 28 September

Ecology, Evolution and Conservation Research

Additional Entry Requirements

Normally an Upper Second Class Honours degree, or better, in an appropriate science subject.

Curriculum

Students will undertake two individual research projects, each of 18 weeks' duration, selected from a range of research areas within ecological modelling and population management; bioinformatics and evolutionary analysis; molecular ecology, phylogenetics and development (lab component); ecology, evolution or conservation field research. Students will write-up both projects in the form of a scientific paper. In addition, students will follow a course of lectures, seminars and practicals that will cover core issues and which reflect the particular needs and interests of the student. Students will also undertake training in a range of transferable skills.

Part-time students

Flexible attendance is possible for students taking the course on a part-time basis. Students will normally take the first five weeks of the taught course and the three week statistics course in Year 1. Students taking the course over two years will undertake the first research project in Year 1 and the second research project in Year 2. Students taking the course over three years will undertake the two research projects between Years 1 and 3.

Duration of Course of Study

Full-time:	One calendar year
Part-time:	Two or three calendar years

Examination

A written report (5,000 words) in the form of a scientific paper and an oral examination on completion of each project and a *viva voce* at the end of the final year examining the taught modules and the research work.

Dates of Examination

Written report and oral examination	March, September
Viva voce	September

For students taking the part-time course, the written reports and oral examination will take place in the year in which the particular components are taken; the *viva voce* will take place in the final year of study.

Entomology

Additional Entry Requirements

Normally a degree of at least an Upper Second Class Honours in biology, ecology, environmental science, biomedical sciences, chemistry or a related science-based subject.

Curriculum

Candidates will study four core modules covering the following topics:

1. Introduction to course
2. Insect and mite systematics
3. Insect diversity and evolution
4. Statistics and Experimental Design

Students will have the opportunity to attend part or all of one of the following topics if they so wish:

a) Population Ecology and Conservation in Action
b) Biological and Chemical Control Methods
c) Decision tools

In addition, students will follow a course of lectures, seminars and practicals that will cover core issues and which reflect the particular needs and interests of the student, with continuous coursework assessment. Students will also undertake training in a range of transferable skills.

Students will undertake two individual research projects, each of 20 weeks' duration, selected from a range of research areas within application technology; applied entomology; biological control; insect conservation; insect evolution; insect physiology; and insect systematics and taxonomy. Students will write-up both projects in the form of a scientific paper.

Normally the research will be conducted in laboratories at Silwood Park or South Kensington, but in special circumstances the project may, with the agreement of the course director, involve a period of up to six months spent outside the College, during which time regular contact must be maintained with the course director.

Part-time students

Flexible attendance is possible for students taking the course on a part-time basis. Students taking the course over three years will normally take the taught components in Year 1 and will undertake the first research project in Year 2 and the second research project in Year 3. Students taking the course over two years may take the taught components in Year 1, or in Years 1 and 2, and will undertake the first research project in Year 1 and the second research project in Year 2.

Duration of Course of Study

Full-time:	One calendar year
Part-time:	Two or three calendar years

Examination

Coursework will be examined in the form of practical write-ups and essays. A written report (5,000 words) in the form of a scientific paper and an oral examination on completion of each project and a *viva voce* at the end of the final year examining the taught modules and the research work.

Dates of Examination

Written report (including coursework) and oral examination	March in the year of study
Written report and oral examination	September in the year of study
Viva voce	By 21 September in the final year of study

Experimental Neuroscience

Additional Entry Requirements

Normally an Upper Second Class Honours degree in a science subject.

Curriculum

Students will follow a programme of lectures, seminars and practicals covering core issues, providing hands on experience of the application of a wide range of core techniques in current areas of neuroscience research coupled with a strong theoretical grounding in the fundamentals of neuroscience. Students will be expected to write three "mini-dissertations" on different topics in neuroscience over the year. Topics will include cellular and molecular neuroscience; introduction to cognitive neuroscience; developmental neuroscience; sensory and motor systems; methods in cognitive neuroscience; neurological and psychiatric disorders; and development adaptation and variation. Courses in personal transferable skills will also be provided. In addition students will undertake three individual research mini-projects, each in different laboratories for a minimum of 10 weeks' duration, and will write a report on each, followed by an oral presentation.

Duration of Course of Study

Full-time: One calendar year

Examination

Three "mini-dissertations" (3,000-5,000 words), a short report (4,000-6,000 words) and an oral presentation on each of the three research mini-projects, continuous assessment of laboratory skills and an oral examination.

Dates of Examination

Mini-dissertation	December, March, June, September
Report	February, May, September
Oral presentation	February, May, September
Written papers	March, September
Oral examination	September

Experimental Physiology and Drug Discovery

Additional Entry Requirements

Normally an Upper Second Class Honours degree, or better, in an appropriate medical or science subject.

Curriculum

The course is delivered in three parts. The first part of the course includes Modules 1-4 of the College-based Home Office training course, together with a 7-week core course designed to equip students for a hands-on in vivo practical training in key techniques. The second part of the course consists of a 16-week programme of mini-projects focused on in vivo research orientated skills. *In this part of the course, students on the bioimaging stream will take specific modules relating to biological and medical imaging.* In the third part of the course, students will complete a 21-week in vivo based research project in one of the following four subject areas: Cardiovascular/Respiratory; Host Defence; Metabolism; Neuroscience, and will produce a written report. *Students on the bioimaging stream will complete a bioimaging based research project and will produce a written report.* The research project will be based either within Imperial or within a pharmaceutical company, during which regular contact would be maintained with the course tutor.

Duration of Course of Study

Full-time: One calendar year

Examination

The first part of the course will be examined by two 2.5-hour written papers. The second part of the course will be examined by in-course assessment, including some or all of the following: written practical reports, problem solving, multiple choice, essays, oral and poster presentations. The research project will be examined by a written report (4,000 – 6,000 words) and an oral presentation. At the end of the year, students will be examined by *viva voce*.

Dates of Examination

Written papers	January
Coursework	January - April
Written report, oral presentation and *viva voce*	By 25 September

Students who successfully complete the Imaging pathway will be awarded the MRes in Experimental Physiology and Drug Discovery (Bioimaging).

Green Chemistry: Energy and the Environment

Additional Entry Requirements

Normally an Upper Second Class Honours degree or better in chemistry. Candidates with degrees in other sciences and/or appropriate experience may also be considered.

Curriculum

Students are required to follow all six of the following lecture modules:

Green Chemistry
Catalysis
Reaction Media
Environmental Chemistry, Economics and Policy
Sustainable Chemical Engineering
Renewable Energy

Students should also attend three optional courses from a selection including:

Biodegradable and Biorenewable Polymers
The Chemistry of Enzymes
Polymerisation Catalysis
Asymmetric Catalysis
Batteries and Full Cells
Ionic Liquids
Biosynthesis and Biomimetic Total Synthesis
Solar Energy
Further Aspects of Biotechnology

Students are required to write a literature review on a relevant area of sustainable chemistry. This undertaking will require regular contact with an appointed academic supervisor.

During the last nine months of the course, students are required to undertake a laboratory-based research project and prepare both a research proposal and a final report on the project, during which regular contact will be made with the project supervisors. Students will also give an oral presentation based on their project work.

In fortnightly small group meetings students will meet with one of the project supervisors to present their recent research and to analyse critically recent literature developments in the field.

Duration of Course of Study

Full-time: One calendar year

Examination

Lecture modules to be assessed by 4 x 3 hour unseen examination papers.
Literature review (10,000 words in length).
Research proposal, quality of practical work, final report on individual research project and oral presentation.

Dates of Examination

Written papers	January, April
Literature review	By mid-November
Project report	By mid-September
Oral presentation	September

Integrated Crop Pest and Disease Management

Additional Entry Requirements

Normally an Upper Second Class Honours degree, or better, in an appropriate science subject.

Curriculum

Students will undertake two individual research projects, each of 20 weeks' duration, selected from a range of research areas within biological control; pesticide science, application and technology; plant pathology and nematology; applied entomology; economics and decision analysis. Students will write-up both projects in the form of a scientific paper. In addition, students will follow a course of lectures, seminars and practicals that will cover core issues and which reflect the particular needs and interests of the student. Students will also undertake training in a range of transferable skills.

Part-time students

Flexible attendance is possible for students taking the course on a part-time basis.

For students taking the course over three years, attendance of taught modules in the Autumn term of the first year is normally required, and completion of one 20 week research project in the second year and completion of one 20 week project in the third year.

For students taking the course over two years, attendance of taught modules and completion of one 20 week project in the first year, and attendance of taught modules and completion of one 20 week project in the second year, is normally required.

Alternatively, for students taking the course over two years, attendance of taught modules and completion of one 20 week project in the first year could be followed by the completion of one 20 week project in the second year.

Duration of Course of Study

Full-time: One calendar year
Part-time: Two or three calendar years

Examination

A written report (5,000 words) in the form of a scientific paper, an oral examination on completion of each project and a *viva voce* at the end of the final year examining the taught modules and the research work.

For students taking the course part-time, the written reports, oral examinations and coursework assessment will take place in the year in which the particular components are taken; the *viva voce* will take place in the final year of study.

Dates of Examination

Written report	March, September
Oral examination	March, September
Coursework	Continuous assessment
Viva voce	September

Integrative Biomedical Sciences*

Additional Entry Requirements

Normally an Upper Second Class Honours degree in a science subject.

Curriculum

Students will follow a programme of lectures and seminars covering core issues and strengthening their knowledge in areas of scientific interest and will receive training in, and hands-on experience of, a wide range of scientific methods and techniques as appropriate, including confocal microscopy, gene arraying, molecular and cellular imaging, proteomics, bioinformatics, protein expression and characterisation, mutational analysis, cell culture, biochemistry and animal handling. Courses in personal transferable skills will also be taken. In addition, students will undertake three individual research mini-projects, each of 12 weeks' duration, and will write a report on each, followed by an oral presentation or *viva voce* examination. Students will undergo a *viva voce* at the end of the course, during which they will be required to discuss the taught part of the course and their project work.

Duration of Course of Study

Full-time: One calendar year

Examination

A short report (2,000 - 3,000 words) on each of the three mini-projects, an oral presentation on two of the three mini-projects, and a *viva voce* examination of the third.

Dates of Examination

Report and oral presentation/*viva voce*	February
Report and oral presentation/*viva voce*	May
Report and oral presentation/*viva voce*	August

*****Admissions to this course are suspended from October 2009.

Molecular and Cellular Basis of Infection

Additional Entry Requirements

Normally an Upper Second Class Honours degree in a science subject.

Curriculum

Students will follow courses in the areas of genomics and bioinformatics, macromolecular structure and function, biological systems and their genetic manipulation, development of infectious organisms, cellular pathology of infection, and intervention: drugs and vaccines. Courses in personal transferable skills will also be taken. In addition, students will undertake three individual research mini-projects, each of 12 weeks' duration, and write a report, give an oral presentation and be examined orally on the work undertaken during the course.

Duration of Course of Study

Full-time: One calendar year

Examination

Three short reports of 4,000-6,000 words, an oral presentation and a *viva voce* examining the taught part of the course.

Dates of Examination

Report	January, May and September
Oral presentation	January, May and September
Viva voce	January, May and September

Molecular Plant Biology and Biotechnology

Additional Entry Requirements

Normally an Upper Second Class Honours degree, or equivalent, in a biological science subject.

Curriculum

Students will undertake two research projects, each of 20 weeks' duration. Research topics will be interdisciplinary and will include two different (but usually related) areas of work. Students will carry out a literature survey of the proposed project areas and present a seminar on the proposed research and background. Students will write a report on each research project, and give both an interim presentation on their work and a final presentation of results, followed by an oral examination.

Students will also follow a programme of lectures on subjects related to plant science and biotechnology, and will attend courses such as Advanced Topics in Plant Molecular Biology, Plant Environmental Physiology and Plant Biotechnology and Sustainability. Students will attend additional lectures and seminars which are relevant to their interests and receive practical training in research methods and transferable skills. In addition, students will attend weekly journal seminars and will give a number of oral presentations relevant to their research area.

Duration of Course of Study

Full-time: One calendar year

Examination

An interim presentation on both research projects, a written report (each maximum 5,000 words excluding figures, tables and references) and an oral presentation on both research projects, followed by a *viva voce* examining the taught part of the course and the project work.

Dates of Examination

Interim Presentation	January and June
Written report	March and September
Oral presentation	March and September
Viva voce	September

Molecular Science and Engineering of Interfaces*

Additional Entry Requirements

Normally at least an Upper Second Class Honours degree in a Physical Science or Chemical Engineering based subject. Candidates with degrees in other sciences and/or appropriate experience may also be considered.

Curriculum

Students are required to follow the following lecture modules:

Introduction to Science of Interfaces
Experimental characterisation of interfacial structures
Theoretical methods in interfacial science
Chemical reactions at interfaces and energy production/conversion
Self-assembled structures at interfaces
Bio-Interfaces
Engineering of Interfaces
Interfacial Molecular Devices

Students are also required to attend specialist lectures on advanced topics of Molecular Science and Engineering of Interfaces.

Students are required to write a literature review on an interfacial science topic. In addition students will undertake an individual research project, prepare a final report on the project and will give an oral presentation based on the research project.

Duration of Course of Study

Full-time: One calendar year

Examination

A literature report (5,000-10,000 words), two three-hour written papers, dissertation and oral examination of the research project.

Dates of Examination

Written papers	January
Literature Review	Mid-December
Project report	Early September
Oral presentation	Late September

***** New admissions to this course are suspended for entry from October 2009

Nanomaterials

Additional Entry Requirements

Normally an Upper Second Class Honours degree or better in an appropriate science or engineering subject.

Curriculum

Students will follow courses in the areas of supramolecular chemistry, nanostructured inorganic materials, macromolecule/nanomaterials interface, bio-nanomaterials, modelling of nanomaterials, nanostructured devices and nanotechnology foresight. There will also be courses in experimental skills training and in personal transferable skills.

Students will also participate in group workshops and practical workshops and in external study visits, some of which will be overseas. In addition, students will undertake an individual project throughout the course and will submit a literature review and dissertation thereon.

Duration of Course of Study

Full-time: One calendar year

Examination

A literature survey, two three-hour written papers (one of which will be open-book), coursework including practical classes, workshop oral presentations and a report on the external study visit, dissertation and oral examination on the research project and the coursework.

Dates of Examination

Literature Survey	December
Written papers	June
Coursework	Continuous assessment
Dissertation	September
Oral examination	September

Photonics

Additional Entry Requirements

Normally at least an Upper Second Class Honours degree in the Physical Sciences, Mathematics or a relevant engineering discipline. Candidates with degrees in other subjects and appropriate experience may also be considered.

Curriculum

The following compulsory modules will be taken:

Autumn Term
Imaging
Lasers
Optical Measurement and Devices
Optical Communications Physics
Optics Laboratory

Spring Term
Literature review and project plan for the research topic.

Students will undertake an individual research project on an approved topic. Students will be required to attend a series of workshops to enhance the development of their general research, personal and transferable skills.

With agreement, students may be permitted to be examined on up to four option courses offered as part of the MSc in Optics and Photonics with a *pro-rata* reduction in the length of their research project.

Summer Term
Students will complete their research topic and will submit a report thereon.

Duration of Course of Study

Full-time: One calendar year

Examination

Two two-hour written papers.
If applicable, up to four 30 minute written papers.
Assessment of Laboratory Work by report.
Assessment of Literature review by report.
Project work by dissertation and presentation.

Dates of Examination

Written papers	January (and May – if option courses taken)
Dissertation	by 26 September
Oral	by 28 September

A student who has failed one or more of the written examinations may apply to the course director to be permitted to take their one permitted re-sit within the same academic year.

Plastic Electronic Materials

Additional Entry Requirements

Normally at least a First Class or high Upper Second Class Honours degree in an appropriate physical science and engineering subject (such as chemistry, physics, materials, electrical engineering and chemical engineering).

Curriculum

Autumn Term
The following compulsory modules will be taken:
a. Molecular and polymer chemistry
b. Molecular physics and materials science applied to macromolecular materials
c. Electronic and optical properties of molecular materials, optoelectronic processes and modelling
d. Device physics and applications of electroactive materials
e. Two practical training courses

Students will complete a literature review and project plan for the major research project.

The students will attend several appropriate professional skills courses.

Spring Term
The following compulsory modules will be taken:
f. Structural, optical and electrical characterisation of molecular materials
g. Design and processing of molecular materials
h. A relevant Master's level lecture course (i.e. from the MSc in Optics and Photonics)
i. Five practical training courses

Students will begin their work on the major research project.

The students will attend several appropriate professional skills courses.

Summer Term
Students will complete their research topic and will submit a report thereon.

Duration of Course of Study

Full-time: One calendar year

Examination

Six hours of written papers:

one three-hour paper on modules a and b
one three-hour paper on modules c and d

Project work by dissertation and presentation

Dates of Examination

Written papers in first week of Spring term.

Structural Molecular Biology

Additional Entry Requirements

Normally an Upper Second Class Honours degree, or better, in a science subject.

Curriculum

Students will undertake two individual research projects, each of 20 weeks' duration, selected from two of the following five categories: Macromolecular structure-function and structural bioinformatics; X-ray crystallography; Biological nuclear magnetic resonance (NMR); Cryo-electron microscopy (cryo-EM); Mass spectrometry (MS).

Students will write a report and give an oral presentation on both projects, followed by a *viva voce* after each. In addition, students will write a dissertation investigating/debating on one or more aspects of structural biology. Students will also follow a programme of lectures covering the principles of various aspects of structural biology, including Macromolecular Structure Principles, Macromolecular Structure Determination and Macromolecular Structure-Function. In addition, students will attend seminars which are relevant to their interests and receive practical training across all key techniques. Courses in professional and transferable skills will also be taken.

Duration of Course of Study

Full-time: One calendar year

Examination

There will be a written report (4-6,000 words), an oral presentation, and a *viva voce* on each of the two projects. Students are required to write a dissertation (approximately 3,000 words) investigating/debating on one or more aspects of structural biology. There will be a final *viva voce* examination with the external examiners, examining the taught part of the course and the project work.

Dates of Examination

Written report	March, September
Oral examination	March, September
Dissertation	July
Viva voce	September

Synthesis in Medicine*

Additional Entry Requirements

Normally an Upper Second Class Honours Degree from a UK academic institution for a course containing some basic synthetic chemistry, or an equivalent overseas qualification.

Curriculum

Students will be examined on six of the following lecture modules:

Advanced synthesis
Advanced problem classes
Advanced heterocyclic chemistry
Biosynthesis and biomimetic total synthesis
Catalytic asymmetric synthesis
Biological molecular recognition
Chemistry of enzymes
Chemistry of gene therapy
Chemistry of medical imaging
Combinatorial and solid phase synthesis
Pharmaceuticals
Protein function
Physical methods in biological chemistry
Solid phase peptide synthesis
Synthesis of phosphorylated biomolecules

Students are required to write a literature review on the medical background to their project, supported by a minimum of fortnightly meetings with their medical supervisor / advisor.

During the whole of the course, students are required to undertake a laboratory-based research project directed by two supervisors, one with expertise in synthetic chemistry, and the other with expertise in an aspect of medical research. Students will write a report and give an oral presentation based on their project work.

Duration of Course of Study

Full-time: One calendar year

Examination

Lecture modules to be assessed by unseen examination papers
Medical review in support of research project (10,000 words in length)
Final report on individual research project
Oral presentation

Dates of Examination

Written papers	January and May (division depending on modules selected)
Medical review	By mid-December
Project report	By early September
Oral presentation	Late September

*New admissions to this course are suspended for entry from October 2009

Systems and Synthetic Biology

Additional Entry Requirements

Normally a degree of at least an Upper Second Class Honours in a Physical, Engineering, Mathematical, or Life/Biomedical Sciences-based subject or an overseas qualification of equivalent standard.

Minimum GCE A/AS level grade A in mathematics will normally be required for entry, or an overseas qualification of equivalent standard.

All candidates will be required to submit an essay (maximum 2,000 words) as formal evidence of multidisciplinary interests and as an additional evaluation tool for overseas students.

Curriculum

Students will follow a core curriculum consisting of six modules, composed of lectures, practicals (computer and wetlab), and case studies. Modules will cover essentials for Life Scientists and for Physical Scientists; molecular biology and functional genetics; biophysics and systems biology; physiological systems; advanced technology and data analysis; and bioengineering and synthetic biology. Each student will conduct two case studies as short research projects.

Students will choose an 8-month long research project supervised by at least two supervisors with different expertise. Students will write a research proposal on their chosen research project, as well as a final project report.

Duration of Course of Study

Full-time: One calendar year

Examination

Two case studies, one presented orally, the other one written up (4-page report (minimum font size 10pt Arial), including figures); research proposal (6-page document (minimum font size 12pt Arial), including figures); written research project report (maximum 40-page document (minimum font size 12pt Arial), including figures and references) and *viva voce*.

Dates of Examination

Two case studies	November-December
Research proposal	January
Project report and viva	By 21 September

Master of Business Administration (MBA)

Management (Full-time Students)

Additional Entrance Requirements

Applicants will be expected to have a minimum of three years' continuous relevant full-time work experience after graduation.

A Graduate Management Admissions Test (GMAT) score of 600 or above is essential for all applications.

Curriculum

Students are required to follow the core courses, the integrative courses, six electives and undertake a research project.

(a) *Core courses* (Weighted at 25%):
Accounting & Management Analysis
Business Economics
Economic Framework
Financial Management
Marketing Management
Organisational Behaviour
Quantitative Methods
Strategic Management

(b) *Integrative Course* (Weighted at 20%):
Innovation, Entrepreneurship & Design

(c) *Six of the following electives* (Weighted at 30%):
Advanced Company Valuation
Advanced Corporate Finance
Brand Management
Breakout Strategy
Consuming and Adopting Innovation
Corporate Social Responsibility
Derivatives
Designing & Innovating Services
Entrepreneurship in Renewable Energy
Hedge Funds
Hi-tech Strategy
Managing & Valuing Intellectual Property
Leadership
Managing Organisational Change
Managing Negotiations
Mergers & Acquisitions

New Ventures in Health Sector
Pricing Strategy
Private Equity: Growth Capital
Private Equity: LBO; Mezzanine: HY Finance
Project Time, Cost and Risk Management
Real Options Analysis
Strategic Management Accounting
Sustainability
Venture Capital Finance

(Further electives may be introduced later; not all will necessarily be offered each year.)

(d) One of the following (Weighted at 25%):
An individual project
Integrative Consultancy Project
Assessed Internship

Duration of Course of Study

Full-Time: One calendar year

Examination

1. Coursework and Examinations
2. Project Report
3. Oral examination at the examiners' discretion.

Dates of Examinations

Written papers	December and January (for the core courses)
Coursework	Continuous assessment
Project Report	mid-September

A student who has failed one or more of the written examinations may apply to the course director to be permitted to take their one permitted re-sit within the same academic year.

Management (Part-time Students)

Additional Entrance Requirements

Applicants will be expected to have a minimum of three years' continuous relevant full-time work experience after graduation.

Curriculum

Students are required to follow the core courses, the integrative courses, six electives and to undertake a research project.

(a) *Core courses* (Weighted at 30%):
Accounting Management Analysis
Business Economics
Economic Framework
Financial Management
Marketing Management
Organisational Behaviour
Quantitative Methods
Strategic Management

(b) *Integrative Course* (Weighted at 15%):
Innovation, Entrepreneurship & Design

(c) *Six of the following electives* (Weighted at 30%):
International Study Tour (compulsory)
Advanced Company Valuation
Advanced Corporate Finance
Brand Management
Breakout Strategy
Consuming and Adopting Innovation
Corporate Social Responsibility
Derivatives
Designing & Innovating Services
Entrepreneurship in Renewable Energy
Hedge Funds
Hi-tech Strategy
Managing & Valuing Intellectual Property
Leadership
Managing Organisational Change
Mergers & Acquisitions
New Ventures in Health Sector
Pricing Strategy
Private Equity: Growth Capital
Private Equity: LBO; Mezzanine; HY Finance

Project Time, Cost and Risk Management
Strategic Management Accounting
Sustainability
Venture Capital Finance

(Further electives may be introduced later; not all will necessarily be offered each year.)

(d) All students will be required to prepare a group or an individual project report which may involve a period of up to three months spent outside the College, during which regular contact will be made with the project supervisor (Weighted at 25%).

Duration of Course of Study

Part-Time:	24 months (commencing each December)
	21 months (commencing each April)

Examination

1. Coursework and examination papers in all subjects with the exception of Quantitative Methods and the Integrative Courses which are assessed by coursework only.
2. Project Report (up to 20,000 words in length).
3. Oral examination at the examiners' discretion.

Dates of Examinations

Written papers	August (Part I) and January/February (Part II)
Coursework	Continuous assessment
Project Report	End of second year

Management (Distance Learning Students)

Curriculum

Students are required to follow the compulsory courses and a specialisation.

(a) *Compulsory courses*

Managing People and Organisations
Managing Processes and Products
Information Systems Management
Economics for Business
Managing Finance and Accounts
Managing Markets and Competition
Decision-Making
The Imperial Edge

(b) *One of the following specialisations*

Entrepreneurship
Customer Focused Strategy
Investment and Risk
Health Management
Telecommunications

(c) Students will also undertake an individual research project on an approved topic and will submit a report thereon.

Duration of Course of Study

Distance Learning: Minimum period of two academic years and a maximum period of four academic years.

Examination

Eight three-hour written papers
Project Report

Dates of Examination

Written papers	May each year
Coursework	Continuous assessment
Project Report	Deadline for submission is 21 May each year

Master of Education (MEd)

Surgical Education

Additional Entry Requirements

Normally a degree in medicine or at least an Upper Second Class Honours degree in a science, engineering, computing, healthcare or education subject and

Basic computing experience and

Normally three years of relevant experience in a healthcare field (not necessarily surgery) and/or relevant teaching/education development and research experience.

Curriculum

Students will follow a core course consisting of five compulsory taught modules covering the following areas: policy and context of surgical education; theory and practice of learning and teaching; theory and practice of technology and simulation in surgery and education; and the purposes and application of assessment and appraisal within learning. All students will undertake a taught research methods module, followed by an individual research project. All students will normally undertake one optional taught module selected from options in the following areas: surgical technology; health management; history and archaeology of medicine and disease; quality and safety in healthcare. Taught modules will be examined primarily by summative written work, with some assessed coursework also being admissible, and the research project will be written up in the form of a dissertation.

Duration of Course of Study

Full-time:	One calendar year
Part-time:	Two calendar years

Examination

Taught modules will be assessed by summative essays of specified length, normally between 3,600-4,400 words. Students will write a dissertation of 15,000-20,000 words. A *viva voce* examination may be given at the discretion of the examiners.

Dates of Examination

Summative essays	By module, normally within three months of completion of teaching
Coursework	Continuous assessment by module
Dissertation	By 25 September in the final year of study
Viva voce (discretionary)	By 25 September in the final year of study

University Learning and Teaching

For students registered before 1 September 2011.

Additional Entry Requirements

Normally an Upper Second Class Honours degree in any subject from a UK academic institution or an equivalent overseas qualification

AND

Possession of 24 'M' level credits achieved at Imperial College London and recognised by the HEA

AND

Candidates must be employees of Imperial College London at the time of enrolling onto the course.

Entry Routes

Entry Route 1
For those who have taken successfully, within five years of the proposed date of entry to the MEd, the four modules that comprise CASLAT, but have not been awarded the CASLAT qualification;

Until 2011 those who were awarded the CASLAT qualification before January 2009 will also enter by this route.

Requirements: Possession of the four modules that comprise CASLAT, totalling 24 ECTS.

Entry Route 2
For those who have obtained HEA Fellowship through the experienced/professional recognition route, within five years of the proposed date of entry to the MEd;

For those who started CASLAT in or after January 2009 and have opted to be awarded the CASLAT qualification, within five years of the proposed date of entry to the MEd.

Requirements: 12 hours of workshop attendance, summary of current role in supporting learning, and/or teaching and/or supervision, and submission of a critical review of a set educational paper, totalling 24 ECTS.

Entry Route 3
For experienced staff without HEA Fellowship through the experienced/professional recognition route;

For those whose Fellowship, or CASLAT, or four equivalent modules fall more than five years prior to entry to the programme and therefore cannot considered within the College's APL arrangements.

Requirements: As for Route 2 plus submission of a teaching portfolio, totalling 24 ECTS.

Curriculum

Normally candidates will have followed a preliminary module for which they have received 24 ECTS credits. Students will then follow a programme consisting of five compulsory modules that total 66 ECTS. These consist of a library based study of student learning in higher education, particularly as relevant to their own teaching discipline, an educational research methods course, with linked dissertation plan and the conduct of a small empirical study and a continuous seminar focused on issues and ideas in education at university level.

Duration of Course of Study

Part-time: Normally 18-48 months in total; Modules B to E must be completed within a maximum of 20 months from the date of registering to start the module, with the whole programme being complete within a period of 48 months. Within the 48 month period there can be periods when students are not registered for a module (other than Module F) without the need to interrupt studies and also periods when they are registered for more than one module (in addition to Module F).

Module B Theory and Reflection: Student Learning Research Project
Module C Educational Research Methods
Module D University Education Project Plan
Module E University Education Research Project
Module F MEd Seminar

Examination

Assessment of Module B is through a project report; assessment of Module D is through a research plan; assessment of Module E is by dissertation; assessment of Module F is through coursework. There is an attendance requirement to be met to gain credit for Modules C and F. All candidates will take a *viva voce* on completion of Module E.

Dates of Examination

Project report of 6,000 – 7,500 words (Module B)	*see below
Research plan (Module D)	*see below
Dissertation of 15,000 – 20,000 words (Module E)	*see below
Coursework (Module F)	by completion of module

There is an attendance requirement to be met to gain credit for Modules C and F.

*The report, plan and dissertation must be completed within a maximum of 20 months of starting the module. The cut off date for work to be submitted to the Examination Board is 25 September each year.

University Learning and Teaching (Postgraduate Certificate, Postgraduate Diploma and MEd)
(+ optional faculty identifier)

For students registered on or after 1 September 2011[1].

Additional Entry Qualifications

Normally an Upper Second Class Honours degree in any subject from a UK academic institution or an equivalent overseas qualification **and** participants must have subject based expertise commensurate with level of their role **and** must have an appropriate range of teaching/supervision duties which can form the practice base of the programme (normally at least two terms or equivalent of significant teaching/supervision experience before registering) **and** be currently (and for the period of registration) teaching and/or supervising in higher education.

Curriculum

Postgraduate Certificate - this comprises three compulsory introductory workshops, together with an induction session, an individually negotiated personal teaching and learning plan and a statement of teaching philosophy. This is followed by a second phase in which students will take topics chosen according to individual interest, need and teaching responsibility, from the following topics: teaching methods; educational design; assessment & feedback; evaluating practice; educational supervision; e-learning; public engagement; research and teaching; the ethical professional; inclusion; education in practice topic: practice-integrated topic.

Postgraduate Diploma – this comprises two separate weeks of teaching and group activities. Week one introduces the Diploma structure and prepares participants to engage more critically with the educational literature, and the second week investigates the main educational theories and considers critical writing skills for education. The last part of the Postgraduate Diploma stage consists of a library-based education project.

Master of Education – this comprises a week of face-to-face teaching and group activities that provides an overview of research methods in education and reinforces understanding of the role and nature of research and evaluation in education. Students will then undertake an individual research project in an appropriate aspect of university education and submit a dissertation of 10,000-20,000 (±10%) words.

Duration of Course of Study
Part-time: Postgraduate Certificate normally 6 - 24 months in total; Postgraduate Diploma normally a further 12 months in total; Master's normally a further 6 - 24 months in total.

Examination

For the **Postgraduate Certificate** each topic has an outcome assignment; this will be submitted for formative assessment at the end of each topic. Having completed the appropriate number of topics from the choice available, the formatively assessed outcome assignments are assembled with a short

[1] Staff registered on the existing Certificate of Advanced Study in Learning and Teaching (p.168) may transfer to the new PG Certificate in Learning and Teaching with effect from May 2011.

explanatory piece to show personal and disciplinary context and links to future development. This is submitted for summative assessment.

For the **Postgraduate Diploma** summative examination is by submission of two essays (2000-3000 words ±10%), one after each of the taught weeks. The major piece of summative assessment for the Postgraduate Diploma is the library or alternative work based education project and students will submit a report of 5,000 - 7,000 words (±10%).

For the **Master of Education** students will undertake an educational enquiry project or appropriate work-based alternative in an aspect of university education and will be examined by dissertation of 10,000-20,000 words (±10%) and by a *viva voce* examination.

Dates of Examination

For the **Postgraduate Certificate** each assignment will normally be submitted 6 weeks following the date of the relevant topic workshop. The summative assessment will be submitted within the normal deadline of the course.

For the **Postgraduate Diploma** each essay will normally be submitted 6 weeks following the relevant taught week. The library project will normally be submitted for final examination a maximum of 6 months after completing the taught component.

For the **Master of Education** the dissertation will be submitted, and students will undergo a *viva voce* examination, within the normal deadline of the course.

Students can graduate with an award at the appropriate level in University Learning and Teaching (+ optional faculty identifier). In order to add the optional faculty identifier, submissions must show critical engagement with discipline specific educational theory and literature as well as disciplinary context.

Master in Public Health (MPH)

Additional Entry Qualifications

Normally a Second Class Honours degree, or better, in a medical, biological science or environmental science subject.

Curriculum

Students will complete a series of compulsory taught modules in the first term, focusing on core concepts and techniques in modern epidemiology, biostatistics and public health. In the second term, students will follow a mixture of compulsory public health modules and more specialised, optional modules which will permit a degree of specialisation either toward chronic disease, infectious disease or organisationally operational public health. In addition, students will undertake two mini-projects which will involve the detailed study of the public health issues relating to either a global health problem or the epidemiology of a specific disease.

Students will then undertake an individual research project. Part-time students will undertake a research project at their place of work and full-time students will undertake a research project within the School of Public Health, the Business School or in collaboration with NHS organisations, external companies or government agencies.

Duration of Course of Study

Full-time:	One calendar year
Part-time:	Two or three calendar years*

Examination

Two 3-hour written examination papers, two mini-projects (each of 4,000 words, excluding references, figure legends and abstract), a research dissertation (of 12-15,000 words, excluding abstract, references and tables and figures captions) and an oral presentation in the final examination.

Dates of Examination

Written examinations	January and May of the relevant year
Mini-projects	December and March of the relevant year
Research dissertation and *viva voce*	September in the final year of study

A student who has failed one or more of the written examinations may apply to the course director to be permitted to take their one permitted re-sit within the same academic year.

*Part-time new admissions are suspended for entry in October 2010.

Certificate of Advanced Study (CAS)

Allergy

Additional Entry Requirements

Normally a degree in Medicine or at least an Upper Second Class Honours in a healthcare related subject, typically Nursing, Dietetics, Immunology/Physiology or Biomedical Science.

Curriculum

The curriculum consists of three taught modules covering the following areas: the scientific basis of allergy; diagnosis and treatment of allergic disease; and the cutting edge of allergy. The modules cover both scientific theory and practical clinical aspects of allergic disease. Candidates will attend lectures and clinics, and will be expected to undertake self-directed learning and complete assignments throughout the course via the Web.

Duration of Course of Study

Part-time Nine months

Examination

Modules will be assessed by a combination of essays and reports with a word limit of 2000-2500 words, written and practical examinations. Candidates will also be required to maintain an electronic learning portfolio including a reflective log of their clinical activities and skills.

Date of Examination

The scientific basis of allergy (Module 1)	December
Diagnosis and treatment of allergic disease (Module 2)	March
The cutting edge of allergy (Module 3)	June

Industrial Pharmaceutical Chemistry

Additional Entry Requirements

The minimum qualification for admission to the Certificate is normally at least an Upper Second Class Honours degree in Chemistry from a UK academic institution or an equivalent overseas qualification. Candidates must have completed any probationary period at GlaxoSmithKline (GSK) prior to entry to the course, and will be required to be and remain GSK employees throughout the programme. If candidates leave GSK, they may not be able to complete the Certificate programme. Imperial will make every effort, on a case-by-case basis, to allow candidates to use work they have already carried out as credit towards alternative Imperial Certificate or Master's qualifications.

In addition, all applicants must satisfy the College's English Proficiency Requirement.

Prior to submitting Imperial College entry forms, prospective candidates will be required to complete a Candidate Nomination Form on which their managers will confirm that their application is supported and that they will have the opportunities to demonstrate the required competencies as part of their GSK employment. Special cases for admission will be considered initially by the course Programme Management Committee and subsequently by Imperial College London.

Curriculum

All Units are compulsory as described in the Programme Specification:

Unit 1: Chemistry for Manufacture (7.5 ECTS credits)
Unit 2: Process and Compliance (5 ECTS credits)
Unit 3: Application and Tools (7.5 ECTS credits)
Unit 4: Chemistry of the Process (at expert level) (7.5 ECTS credits)
Unit 5: Professional Achievement Review (2.5 ECTS credits)

The assessment of the Certificate programme comprises:

Units 1-3

i. Continuous assessment of the competencies within each Unit
ii. Assessment of the Imperial College lecture course via online problem sheets
iii. End of Unit assessments

i. Continuous assessment of competencies
On completion of the elearning training materials, candidates will complete multiple choice questions which will be assessed on-line using the GSK 'My Learning' system. In addition the appropriate GSK manager or expert will evaluate how successfully the candidate has demonstrated that he/she has applied the necessary knowledge, understanding and skills associated with each competence in the workplace. The outcomes will be reported using standard GSK evaluation forms.

The Chemistry of the Process competency will be assessed differently as the elearning training approach with assessment using multiple choice questions would not be suitable. The assessment will include production of a detailed presentation on the chemistry of the process which will be assessed by the Imperial Examiner. This will be sent in advance to Imperial, and the Imperial Examiner will grade it and carry out a viva examination via videoconferencing to test the candidate's understanding.

ii. Assessment via on-line problem sheets
The Imperial College lecture course in Unit 1 will be assessed by a short on-line problem sheet at the end of each lecture, and a synoptic problem sheet which will include a different problem for each student, thus preventing plagiarism.

iii. End of Unit assessments
The candidate will be required to make a written submission showing that he/she has not only understood and applied the individual competencies required for the unit but has also understood how the competencies support each other and do not stand independently in the workplace. This submission of discursive writing should be supported by any relevant reports which have been written at the time of the work. These reports could be project or interim reports written to communicate information to enable management to make decisions on project activity. Copies of the evaluation forms used by managers/supervisors and the printouts of results from the multiple choice questions will also be included. The end of unit assignment would be normally expected to not exceed 1,000 words excluding the attached reports.

Assessment of the end of unit submissions (Units 1, 2 and 3) will be carried out by the Primary Supply Technical Shared Service (PSTSS) Chemistry Lead, the Cork Chemistry Leader and the Jurong Chemistry Leader.

Unit 4

The candidate will be required to produce a presentation summarising the development history of a GSK product which may be the product they are working on. They will also complete a genotoxic risk assessment for a GSK synthetic route which will be provided to them.

This unit will also test candidates' advanced problem solving skills, building on the lecture material in Unit 1. Problem sheets (9 per year) will be set by Imperial teachers. Candidates will be able to submit written solutions via Blackboard by a given deadline. These will be assessed by Imperial and followed by an online problem class to review the solutions and issues arising. Candidates will be required to attain a pass mark in five of these problem sheets.

The candidate will be required to make a written End of Unit assessment submission showing that he/she has not only understood and applied the individual competency required for this unit but has also understood how this competency is supported by others and that it does not stand independently in the workplace. Candidates should demonstrate in this written submission that they have a good understanding of the chemistry of the process they are working on at an expert level. This submission of discursive writing should be supported by any relevant reports which have been written at the time of the work. These reports could be project or interim reports written to communicate information to enable management to make

decisions on project activity. The end of unit assignment would be normally expected to not exceed 1,000 words excluding attached reports.

Assessment of the end of Unit 4 submission would be carried out by the Primary Supply Technical Shared Service (PSTSS) Chemistry Lead, the Cork Chemistry Leader and the Jurong Chemistry Leader with support from GSK product or process specialists.

Unit 5

Unit 5 will comprise two elements of assessment:

i) A final report, supported by appropriate evidence, to demonstrate that the candidate has fully understood the application of the competencies in the workplace. This submission of discursive writing should refer to the end of unit submissions and may reference any of the supporting reports included at the unit level. Other reports may also be attached and referenced. The submission would normally be expected to not exceed 2,000 words, excluding attached reports.

ii) A report referencing the professional attributes/ transferable skills listed in the programme specification and other evidence of technical and professional development. This will be a reflective commentary demonstrating that achievement of the competencies that make up the GSK Primary Supply Chemistry Competency Development framework meet the requirements of the RSC's Professional Attributes (as required for the purpose of achieving CChem/CSci) and to the QAA Benchmark Statement for Chemistry. The commentary will not normally exceed 2,000 words, excluding attached evidence.

Duration of Course of Study

The programme will be part-time and work-based. The duration of the Certificate programme will depend on the number of years of experience of working within the pharmaceutical industry. It is anticipated that recently appointed candidates may take up to three years to achieve the competencies required for the award of the Certificate. Those with more experience will be able to achieve the award in a shorter period of time. The minimum period of registration will normally be one year, and the maximum period will be four years.

There will be four entry points during the year: 1 October, 1 January, 1 April and 1 July.

Examination

There will be no formal examinations in the programme. Candidates must complete all the internal GSK course requirements for demonstrating the required competencies, and must complete the end-of-unit assignments, and the Imperial assessments, to the standards required by the Board of Examiners.

Learning and Teaching

Additional Entry Requirements

Before registering for the full certificate (i.e. the last two of the four modules) the following are required:

Currently teaching (and/or supervising) more than the occasional session (and/or student) and having completed at least two terms of teaching/supervision experience;

Completion, or AP(E)L, of four allowable core workshops for experienced teachers (and five for non-clinical probationary lecturers) in the areas of Communicating Knowledge, Teaching for Learning, Designing for Learning, Supervising Postgraduate Students and Becoming a Personal Tutor. Four core workshops comprise Module 1 for teachers continuing to CAS registration.

Curriculum

The course consists of four modules: the Core Module 1, covering the areas of Communicating Knowledge, Teaching for Learning, Designing for Learning, and either Supervising Postgraduate Students or Becoming a Personal Tutor (approximately 40-45 contact hours); the Options Module 2 covering assessment and areas selected to reflect the participant's interests and discipline (may include six hours from the fifth core workshop when taken) (minimum 12 contact hours); the CASLAT Module 3 that focuses on important contemporary issues in teaching and learning (approximately 15 contact hours); and the CASLAT Assessment Module 4, including as Part 1 two summative observations of teaching and as Part 2 a project portfolio.

Duration of Course of Study

Part-time: Normally 15-20 months in total; Modules 3 and 4 are normally completed in one calendar year, the year of CASLAT registration.

Learning Outcomes

Those completing CASLAT will:

Demonstrate their understanding of the scholarship of how students learn through its impact on the teaching, assessment and course design modes that they employ.

Design a course in their discipline and implement a range of teaching methods. Examine critically the likely advantages and disadvantages of the approaches to teaching employed.
Employ good practice in respect of student support, feedback and assessment, showing due respect for individual learners and their development.

Use and analyse critically the strengths and weaknesses of a range of methods for evaluating teaching.

Be aware of potential uses and the implications of communications and information technology for changing pedagogic practice.

Be constructively critical and reflective about their own pedagogic practice.

Have a working knowledge of the procedures, codes and norms pertaining to educational processes in their department/division, the College and, as appropriate - more widely - in England.

Dates of Examination

Summative Assessment is by:

Part 1. Two successful teaching observations to be completed by November of the year of registration.
Part 2. Written Portfolio, to be completed in early January of the year following registration.

Participants registering for the full CASLAT certificate from January 2009 onwards will, upon successful completion of the programme, have to choose between:

a) Acceptance of the Certificate of Advanced Study in Learning and Teaching

OR

b) Acceptance of a transcript and certificate of completion of CASLAT modules 1-4. (This option is recommended for those considering future registration for the MEd in University Learning and Teaching.)

Progression from CASLAT to the MEd in University Learning and Teaching

(i) Candidates starting CASLAT in or after January 2009 will be able to opt not to be awarded the CASLAT qualification and go on to take the MEd award. In this case they will be awarded 24 ECTS under the College's APL arrangements and this will meet the entry criteria for the MEd. Under the College's APL arrangements, the CASLAT must have been undertaken no more than five years before the proposed date of entry to the MEd.

(ii) If, after five years, candidates who have completed the CASLAT programme have not registered for the MEd, they will be awarded the CASLAT certificate.

(iii) The award of CASLAT will not be made to a candidate who has successfully completed CASLAT but who is subsequently unsuccessful in the MEd programme.

(iv) Candidates starting CASLAT in or after January 2009 who are awarded the CASLAT qualification cannot then use it under the College's APL arrangements for entry to the MEd course.

(v) Candidates who have been awarded the CASLAT qualification before January 2009 will be given a period of three years (until 2011) in which to go on to enter the MEd programme with 24 ECTS. They will keep the CASLAT qualification.

Perioperative Specialist Practitioners*

Additional Entry Requirements

Candidates must be registered healthcare professionals (Nurse, Physiotherapist, Operating Department Practitioner). Evidence of study at first degree level or equivalent is required. Candidates must have the support of a consultant surgeon or anaesthetist as a clinical supervisor for the duration of the course.

Curriculum

The course comprises two parts, a taught component and a clinical component. The taught component consists of nine one-week intensive modules, and will cover the core knowledge, skills and professional attitudes required by the role. The supervised clinical practice will be carried out at the candidate's home trust, which will allow candidates to consolidate and develop this knowledge and skills within their own clinical team. During the clinical component, regular contact would be maintained with the Programme Manager.

Duration of Course of Study

Part-time One academic year

Examination

Each module will be examined by a combination of multiple choice questions and extended matching questions. Scenario-based assessments of clinical procedural skill will be carried out at intervals throughout the course and formal assessments will be held at modules 4 and 8. Candidates will prepare a detailed written case study (approx 5,000 words) relating to the operative and perioperative care of a surgical patient from their speciality, to be completed by the final module. Candidates will be required to maintain a learning portfolio, including an electronic log of their clinical activities and skills.

Dates of Examination

Written examination	End of each module
Scenario based assessment	End of module 4 and 8
Case Study	By end of final module
Learning Portfolio	By end of final module

* New admissions are suspended for entry in October 2010.

Preventive Cardiology

Additional Entry Requirements

Normally a medical degree or equivalent, or at least an Upper Second Class Honours degree in nursing, dietetics, physiotherapy or an appropriate basic science discipline.

AND

Candidates must normally be registered health professionals (e.g. state registered nurse, dietitian, physiotherapist, pharmacist, physician) or Level 4 for the register for exercise professionals.

Curriculum

The course comprises two parts, a core and specialist taught component. The core component consists of one 12 week theory and practice module and the specialist component consists of two specialist optional modules which are selected, one from each of the following fields:

(a)

1. Smoking cessation interventions
2. Nutrition and weight management in CVD prevention
3. Physical activity and exercise in CVD prevention

(b)

4. Risk estimation
5. Medical management of blood pressure and lipids
6. Prevention and management of diabetes

In addition, consolidation and application of theoretical knowledge takes place through a number of arranged clinical observations.

Duration of Course of Study

Part-time: One calendar year

Examination

The core module is assessed by a written exam, a practical exam and a written case presentation. The specialist modules are assessed by a combination of assessment types, including written papers and essays, case presentations, written reports, poster presentation or group debate.

Dates of Examination

Assessment of core module - January
Assessment of optional modules – June

Surgical Care Practitioners*

Additional Entry Qualifications

A clinical background in nursing or one of the allied health professions and at least two years experience working in a surgical environment. Evidence of academic standards above those of a first degree and evidence of advanced professional development is required. Candidates must be employed and have the support of a consultant surgeon mentor for the duration of the course.

Curriculum

The course consists of nine one-week intensive taught modules, enabling students to acquire the core knowledge, skills and professional attitudes required by the role. This will include fundamental surgical techniques, patient safety issues, medical foundations of surgery, relevant anatomy, anaesthetic pre-assessment, clinical examination and team-working. In addition, supervised clinical practice undertaken at the candidate's home trust will allow the participants to develop core and specialist knowledge and surgical skills required to participate in their own surgical team.

Duration of Course of Study

Part-time One calendar year

Examination

Scenario-based assessments of clinical procedural skill will be carried out at intervals throughout the course and formative assessments will be held at modules 4 and 8. There are four parts to the summative assessment in the final module: a short answer exam paper, a scenario-based assessment, reflective writing and a detailed written case study (approx 5,000 words) relating to the operative and perioperative care of a surgical patient from their speciality. Candidates will also be required to maintain a learning portfolio, including a log of their clinical activities and skills.

Dates of Examination

Written case study	Final module
Short answer paper	Final module
Reflective writing	Final module
Scenario based assessment	Final module

* New admissions are suspended for entry in October 2010.