Imperial College

of Science Technology and Medicine

Department of Computing

Undergraduate Studies Committee Report

Imperial College of Science Technology and Medicine

Department of Computing

Undergraduate Studies Committee Report

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1.1 The Future Direction of Undergraduate Teaching in the Department

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1.1 The future direction of undergraduate teaching in the department

Our main teaching goal is to continue to produce the highest quality Computing graduates. They should have the background they require for whatever Computing endeavours they wish to undertake. In order to achieve this goal we plan to maintain the quality of our current provision. Computing is a discipline that is fast moving. We will continue our processes of review and updating to ensure that both our content and our delivery methods are current. We foresee an increase in the breadth of our advanced computing and interdisciplinary courses.

We plan to continue to:

1. Convey an understanding of the foundations of computing and the techniques and skills of application.

2. Enable each student to appreciate changes in the state of the art, and solve problems in applied computing.

3. Develop skills for critical independent scholarship.

4. Place special emphasis on the fundamental principles underlying computing and on the understanding of the engineering considerations involved in computing system design, implementation, application and use.

5. Give a solid background in mathematics relevant to computing and its applications.

6. Provide training in the professional aspects of computing as an engineering discipline.

7. Give students the opportunity to study a wide range of computing topics.

8. Give students extensive practical experience, through a wide range of supporting laboratory and problem solving classes and through project work.

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Quality and Course Development

The Department reviewed its single honours undergraduate computing courses in 1997. In the academic year 1998/99 we had a very successful IEE/BCS accreditation visit. The IEE this year has extended their accreditation until 2003/2004. We have participated in both the "Undergraduate Studies Committee" (1998) and the "HEFCE" (2000) Mathematics reviews for the Mathematics and Computer Science degree.

Course Development Procedures:
Departmental review and approval of courses is the responsibility of the Academic Committee (AC). In practice, course contents are subject to review, revision and approval at several levels, with subcommittees being appointed by the AC as appropriate:

Programme Subcommittees: These undertake periodic major reviews of their programmes. They act as subcommittees to the AC and report their findings to that committee, first in draft form for approval for Department-wide circulation and full discussion, and subsequently for final approval. Last year we are reviewed the first year Computing courses and started the process of reviewing the Joint Mathematics and Computing degrees.

Subject Teams: These undertake periodic review and discussions of courses related to a particular subject area. These are formed to ensure adequate up-to-date coverage of the topic, and to integrate courses so as to minimise any overlap and avoid gaps. Proposals are then brought before the AC.

Course evaluations and revision are regularly instigated by the AC as a result of monitoring performed by the Year or Course (Programme) Co-ordinator, reports from committees such as the Staff-Student Committee and individuals. In fact, the Department has a number of feedback mechanisms for course monitoring, which together cover a wide spectrum of opinion:

Staff-Student Committees
College and Departmental lecturer evaluation questionnaires
Peer review of teaching
External accreditation bodies
External Examiners reports
Undergraduate Studies Committee reviews
Faculty of Engineering Postgraduate Committee reviews
College and University level Committee comment and approval
Alumni and industrial contacts

The Director of Studies and Head of Department consider all comments and recommendations. The Academic Committee, where specific proposals responding to the comments and recommendations are discussed and normally approved, considers

reports from accreditation or review visits. When updating courses, the accreditation and review documents of the current courses are fully considered.

Aims and Learning Outcomes to satisfy the QAA

We have procedures in place for all six of the key aspects of the provision as defined by QAA procedures. Computing has a benchmarking document that is so vague as to provide no guidance to any Computing QAA assessment team. The final benchmarking document in Computing did not reflect our views. That is why we have decided to be assessed against the general Engineering benchmark rather than against the Computing one. We have produced our Programme Specifications for our single honours degree programmes.

Student Population

Demand for our Computing courses remains buoyant at all levels. We could expand our student population slightly in line with an expansion in academic staff. However, we currently have poor student: staff ratios of over 12:1 (counting only undergraduates) and 17:1 (counting all students), Furthermore, we have an urgent need for additional teaching space, in the form of lecture theatres, tutorial rooms, laboratories and PhD rooms. Provided that we can satisfy the above we are confident that we can maintain and even improve our teaching quality, and that we can provide the required advanced computing equipment.

Changes in Undergraduate and Postgraduate Taught Courses Offered

There is a continued high demand for our computing courses. This demand gives us the opportunity to decrease the amount of our teaching administration and provision of introductory courses, and to concentrate our finite teaching effort on broadening our selection of advanced courses.

We are not planning to start any major undergraduate initiatives in the next few years. Last year we agreed that EEE would completely take over the administration and teach the first two years of the ISE degree programmes. We have expanded our intake into our Computing degrees to compensate for the loss of both ISE first and second year student numbers.

Undergraduate Recruitment

Last year we increased our published and actual offer to 3 As. Although total numbers of applicants for places has fallen this year form 16 to 1 to 12 to 1 we strongly feel that the core 600 applications that represent excellent candidates, and to whom we make most of our offers, is stable. We have no reason to believe that applications for the next years should fall so low as to cause any concern.

Of the 600 core applicants many are Cambridge (and some Oxford) candidates. It is not our desire to attract students away from either of these institutions but to ensure that they are aware of the differences (academically and socially) between them and us. To this end we continue to interview the majority of such applicants and have received very positive feedback regarding the frankness of the presentation and individual interviews, and the computing resources that we offer. In many cases this has prompted an individual to carefully reconsider their reasons for applying to other institutions.

The separation of the ISE course from Computing will have an effect on our overall overseas ratio. Traditionally ISE had a larger proportion of overseas applications than Computing. Overseas applications to Computing still demonstrate a lack of understanding of the UK University system as a whole, which results in a large number of inappropriate applications. However there is still a solid core of excellent candidates from which to draw. We would like to see better information and advice given to overseas students to encourage good students and to redirect weaker ones to more appropriate institutions. This, however, is probably outside the scope of the department and possibly the college. We are charging a premium fee for overseas students. We do not believe that this fee has had an adverse affect on our recruitment.

The Joint Maths and Computing applications were good, and we have reluctantly agreed to increase our intake from 30 to 40 as the Mathematics department expressed a need for the extra numbers this year. We will review the situation next year.

As mentioned, any expansion of student numbers is dependent on staff recruitment and additional teaching space in the form of lecture theatres, tutorial rooms, and laboratories.

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1.2 The Objectives and Relevance of Undergraduate Computing Courses

1.2 The objectives and relevance of undergraduate computing courses.

The Department of Computing provides education and professional formation in the applied science and engineering of computation. Our objectives are to develop the intellectual, personal and practical skills of our students, to engage their enthusiasm for computing, and enable them to develop into mature engineers.

Computing is the youngest of the engineering disciplines; it has undergone phenomenal change and development in less than 50 years, and there is every reason to believe that the pace of change will be maintained for many years to come. Consequently our objective is to equip our students with the skills that will enable them to evaluate and assimilate the developments that will inevitably occur during their working lives.

Our courses have therefore been designed to give each student an overview of computing, a deep understanding of the basic concepts and principles, extensive skills in their application and extension, wide practical experience of applied computing, and the ability to appreciate and adapt to changes in the state of the art.

Each of our degree courses provides education and development both in breadth and depth. Breadth is provided by a common set of core courses that introduce a student to all aspects of the subject, and depth by providing a wide selection of optional advanced courses. As one of the largest Computing departments in the country, and with an outstanding record of research achievement, we are uniquely placed to offer a wide variety of courses and an up-to-date view of the subject, taught in depth by leading researchers.

All undergraduate computing courses have a common two year study period: students follow one of the specialist M.Eng courses then select options from a group of advanced courses set down for that specialisation. In this way, the Integrated Engineering Study Scheme in Computing is designed to provide core foundational material to all students while still offering the opportunity to specialise and the flexibility to change.

There is a central "spine" of engineering project and design work running through all years, and a substantial part of the final year (fourth year for M.Eng students, third year for B.Eng students) is devoted to group and individual projects.

A notable feature of all our degree courses is that core lecture courses are supported by an *Integrated Laboratory Course* in each year. These are integrated with the lecture courses and tutorials, reinforcing concepts introduced there, and organised so as to provide a coherent learning progression, which makes uniform demands on student effort and equipment use.

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All M.Eng courses include an approved period of professional formation (either industrial placement or approved extended project work) between Easter of the third year and the start of the fourth year. Students following the M.Eng (European Programme of Study) complete a similar period of professional formation and spend either their third or their forth academic year abroad in an institution of higher education with which Imperial College has an exchange arrangement. These arrangements have been established with comparable institutions in Belgium, France, Germany, Holland, Italy, Norway, Sweden and Switzerland.

The four-year M.Eng degrees were developed in response to a set of emerging needs and imperatives i.e. the development of computing science and software engineering; the requirements for professional recognition both in Europe and in the UK; the requirements for engineers with improved language skills and understanding of international industry; demand from perspective students; opportunities for improved use of resources; College policy.

The understanding of the subject of computing by prospective students has continued to increase. In particular a significant number of students are aware
of, and express interest in, artificial intelligence and management applications of computing. Theses areas, which were always substantial elements in courses, if offered by the Department, are now given appropriate emphasis in tailor made degree opportunities.

We also became increasingly aware of the importance of equipping engineers with the language skills and understanding of international commerce. To this end we introduced the European Programme of study. We wish to exploit the opportunities for the development of suitable programmes of study afforded by the CEC ERASMUS scheme and other international exchange schemes.

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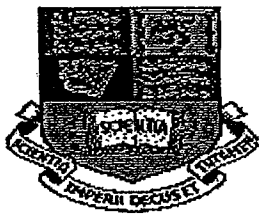

1.3 Course Content and Structure

1.3 Course and Content Structure

Course Description

The scheme is designed to develop the intellectual and practical skills of its students and to engage their enthusiasm for computing. It is based on the four-year MEng courses and the three-year Computing BEng course. These degrees offer a common set of core courses and a variety of specialisations are also available.
BEng Computing G400 provides an education and develops skills in the science and engineering of computation.
MEng Computing G401 provides a general education and professional formation in the science and engineering of computation to an advanced level.
The MEng degree courses with specialisations provide an education and professional formation in the science and engineering of computation and also knowledge of the following specialised fields:
MEng Computing (Software Engineering) G600 provides specialised engineering education in the methods, tools, techniques and processes underlying development of large and complex software.
MEng Computing (Computational Management) G500 provides specialisation in the management of software development and the application of software technology to management and organisational information systems.
MEng Computing (Artificial Intelligence) G700 provides specialisation in artificial intelligence and knowledge engineering; that is, the development of computational and engineering models of complex cognitive and social behaviours.
MEng Computing (European Programme of Study) G402 provides development of linguistic and technical skills through a programme of engineering study in Europe. All courses have a two-year common study period. To give maximum flexibility students may transfer between courses, within the Computing Integrated Engineering Study Scheme, at any time within that period. All students will initially be registered on the MEng Computing course.
Those students who are unsure of their area of specialisation can therefore select MEng Computing and transfer at the end of the second year if desired.

Course structure

The course structure is very flexible providing many option courses. There is also a central spine of engineering project and design work running through all years. A substantial part of the final year (fourth year for MEng Students, third year for BEng students) is devoted to an individual project allowing detailed study of a topic relevant to the student's chosen specialisation. Students following one of the specialised MEng courses will select some of their options from a group of advanced courses set down for that specialisation. All MEng courses include an approved period of professional formation - this will be either industrial placement, extended project work or placement in a European industry or university. It takes place during the period between Easter and the start of the fourth year. The Computing Integrated Engineering Study Scheme has been developed to satisfy the requirements set down by the engineering institutions.

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Accreditation for all courses is give by the Institute of Electrical Engineers (IEE) and British Computer Society (BCS).
Students following the MEng Computing (European Programme of Study) during the fourth year complete one academic year abroad in a recognised institution of higher education (with which Imperial College has an exchange arrangement) within the European Union and EFTA countries.
The scheme has been designed to give each student an overview of computing, an understanding of the basic concepts and principles, skills in their application and extension, the ability to appreciate and to adapt to changes in the state of the art, and practical experience in applied computing. Special emphasis is placed on the fundamental principles underlying computing and on an understanding of the engineering considerations involved in computing system design, implementation and usage. A solid background is given in discrete mathematics (logic, sets, relations and grammars) which is the basic mathematics of computing, as well as in the classical mathematics and statistics relevant to applications engineering and management. Students are introduced to computing architecture and hardware alongside the software which can exploit them. Advanced techniques such as artificial intelligence are presented throughout the scheme. All courses are supported by laboratory and problem solving classes which give 'hands-on' experience.

Lecture Courses

First year :

Term 1	Term 2	Term 3
Declarative Programming I (required)	Databases 1 (required)	Declarative Programming II (required)
Discrete Mathematics 1 (required)	Discrete Mathematics 2 (required)	
Hardware (required)	Programming II (required)	
Logic (required)	Reasoning about Programs (required)	
Programming I (required)		
Terms 1 and 2	**Terms 2 and 3**	
Computer Systems (required)	Directions	
Foreign Language I (required for ME)		
Mathematical Methods and Graphics (required)		

In the above table, ME refers to MEng Computing (European Programme of Study).

Second year:

Term 1	Term 2	Term 3
Algorithms, Complexity and Computability (required)	Architecture II	
Compilers (required)	Artificial Intelligence I (required for MAI)	
Operating Systems II (required)	Computational Techniques (required for MM)	
Software Engineering - Design I (required)	Concurrent Programming (required for MSE)	
Statistics (required)	Networks and Communications (required)	
	Software Engineering - Design II (required)	
Terms 1 and 2	Terms 2 and 3	
Foreign Language II (normally required for ME) In the above table,		

MAI, ME, MM and MSE refer to the MEng Computing streams: Artificial Intelligence, European Programme of Study, Computational Management and Software Engineering, respectively.

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Third year:

Term 1	Term 2	Term 3
Advanced Databases (required for MSE)	Advanced Computer Architecture	
Advances in Artificial Intelligence (required for MAI)	Computational Finance	
Computational Logic	Custom Computing	
Distributed Systems (required for MSE)	Introduction to Bioinformatics	
Knowledge Management Techniques	Decision Analysis	
Operations Research (required for MM)	Graphics	
Quantum Computing	Management - Organisation and Finance (required)	
Simulation and Modelling	Multimedia Systems	
Software Engineering - Methods (required)	Performance Analysis	
The Practice of Logic Programming	Robotics	
	The Practice of Logic Programming (required for MAI)	
	Type Systems for Programming Languages	
Terms 1 and 2	Terms 2 and 3	
Humanities (required for ME)		
Technical Presentation Skills (required for MEng)		

In the above table, MAI, ME, MM and MSE refer to the MEng Computing streams: Artificial Intelligence, European Programme of Study, Computational Management and Software Engineering, respectively..

Fourth year:

Term1	Term2	Term3
Advances in Artificial Intelligence	Advanced Graphics and Visualization	
Advanced Issues in Object Oriented Programming	Automated Reasoning (required for MAI)	
Advanced Operations Research	Complexity	
Computer Vision	Computing for Optimal Decisions (required for MM)	
Intelligent Data and Probabilistic Inference	Domain Theory and Exact Computation	
Modal and Temporal Logic	Grid Computing	
Models of Concurrent Computation	Knowledge Representation (required for MAI)	
Natural Language Processing	Management - Economics and Law (required for MM)	
Network Security (required for MM and MSE)	Multi-agent Systems(required for MAI)	
Program Analysis	Parallel Algorithms	
Software Engineering - Environments (required for MSE)		
Terms1 and2	Terms2 and3	
Humanities		

In the above table, MAI, MM and MSE refer to the MEng Computing streams: Artificial Intelligence, Computational Management and Software Engineering, respectively.

Examinations and assessment

The assessment of student performance is by examination and coursework. This assessment is in four parts (three for the BEng Computing course), one for each year. Each part consists of a group of formal written papers and assessment of laboratory course and project work submitted throughout the year. Students on MEng Computing (European Programme of Study) are assessed during their final year based on their performance in project work, coursework and examinations at their receiving institution.

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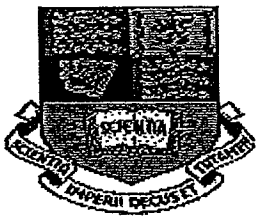

1.5 Details of Course and Student Progression

Details of Course and Student Progression.

Student Progression

The first year of study assumes that the student has little previous knowledge of Computer Science. Much of what is taught and learnt forms a foundation from which the student can build upon in terms of more advanced study in subsequent years. Progression in the first year focuses on three main identifiable areas of competence. By the end of this first year of study we would expect a student to be able to program any problem, which can be solved within a single module (usually with approximately 100 lines of code). They are currently taught Haskell (first), Java, Pentium Assembler and Prolog. They have practical tests in the high level languages, which they are required to pass. We would ensure that they have developed a model of how a computer works in terms of both hardware and software. They have a course in Computer Hardware and in Computer Systems (Architecture and Operating Systems). And finally we would ensure and look for evidence that a student has learnt the underlying Mathematics to be able to cope with the rest of the course. They have a course in Logic, Discrete Mathematics, Mathematical Methods and Reasoning about Programs. Additionally they learn some Graphics and Databases in order to provide relevance for their mathematical courses.

The second year has three objectives each of which expands skills and knowledge established in the first year. By the end of the second year students should be able to solve medium sized problems (usually using several modules), be knowledgeable about the major areas of computing and have been introduced to the major specialisms offered by our department. To develop their problem solving skills they have two courses in Software Engineering (one on design and one on hci and web based programming) and a course on Algorithms and Complexity. Whereas in the first year they have a practical each week, in the second year the lab programme consists of labs that are 2-5 weeks long. In addition to these courses they have a course in Compilers (which builds on both programming and first year mathematics), in Operating Systems (which builds on first year Computer Systems), in Networks and Communications (which builds on first year Hardware and Mathematics) and in Statistics. In order to introduce them to specialisations they also have to choose three options from Architecture II (which builds on Computer Systems), Artificial Intelligence (which builds on Logic), Assured Software (which builds on Discrete Maths and Compilers), Computational Techniques (which builds on Mathematical Methods and Graphics), Concurrent Programming (which builds on Programming and Software Engineering) and a European language.

The third year has three objectives. Firstly, students should be able to solve large programming problems. These include problems that need to be solved by more than one person. All students participate in a group project. BEng students also do an individual project. MEng students have a six-month work placement. Secondly, they should have an understanding of professional issues. They are all required to take a course in Software Engineering, which includes a large component of Ethics and a Management course.

Thirdly, they should have the opportunity of developing a breadth of knowledge across their choice of options. They have a choice of six courses out of approximately twenty.

The fourth year is about developing depth of computing knowledge. Students choose eight courses from approximately twenty-five. These courses reflect the research expertise within the department and students can specialise in certain areas or take a broad range of subjects. At this level almost all of the courses have a fairly large mathematical content. We expect our graduates to be well prepared to undertake research as well as enter whatever Computing area they wish to undertake. These students are normally excellent programmers as well, as can be seen by their individual projects.

1.5 Details of Joint Courses Offered Within the Department

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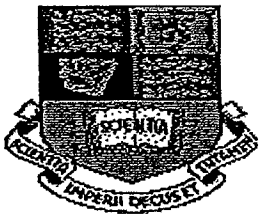

1.5 The Joint Maths & Computing Degrees

Details of Joint Courses Offered Within the Department

The Joint Maths & Computing Degrees.

Entrance requirements

The normal minimum entry requirements, common to all courses within the scheme, are three A levels at A grade, including Mathematics (pure mathematics or a mathematics subject containing an element of pure mathematics) and a hard science subject (such as Physics, Chemistry or Biology). Applications from individuals with suitable non-GCE qualifications, such as Scottish Highers, International, French and European Baccalaureates are also welcomed. Applicants for admission will not be judged by academic ability only but upon a wider profile to assess their potential for success in an engineering career. Applicants for admission to the MEng Computing (European Programme of Study) should normally hold a GCSE in a foreign language at grade B or above, or otherwise be able to demonstrate linguistic competence. Applicants considered likely to receive an offer of admission are invited to attend for interview. The interview is preceded by a talk outlining the major features of the scheme and its constituent courses, and by a tour of the campus conducted by our second year students. The interview has two main purposes: to enable the interviewer to obtain an impression of the candidate's motivation and suitability for the course, and to give candidates the chance to raise questions about the courses or College life in general.

General Notes

The degrees are unit based. You may accumulate up to four units per year, making a maximum of twelve for the BSc and sixteen for the MSci. To proceed to the following year you need generally to have passed at least three units in the preceding year. If you fail to obtain a particular unit or half-unit you may be allowed to resit, either in September or in the following year.

The marks from each discipline are accumulated over the three or four years to obtain two final marks. These are then used to decide the final degree classification. The marks from each year are weighted as follows:

BSc degree: 1 : 3 : 4

MSci degree: 1 : 2 : 3 : 4

There are currently two Joint Departmental prizes for JMC students. One prize is available for a first or second year student, for all round excellence, and the second prize is for a graduating student, again for all round excellence.

The particular structure and regulations for each year are given on the next page.

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First Year

Students take four half-units in Mathematics, assessed by examination and coursework. Coursework contributes 10% to each Mathematics half-unit.
They take two units in Computer Science. Computer Science I, a full unit, is obtained by examination and coursework in the Computing courses: Logic, Reasoning about Programs and Architecture I. There is a half-unit comprising regular Term 1 and Term 2 labwork from Mathematics and Computing, each discipline contributing half the marks and a second half-unit comprising an examination and coursework in programming, together with Term 3 labwork in Prolog and Haskell. Coursework is weighted as one-seventh of the examination/coursework contribution for each Computing course.
Students must obtain three Mathematics half-units and all the Computing units in order to enter the second year. To pass each Mathematics half-unit 30% is required. To pass Computer Science I an average of 40% in the examinations must normally be obtained as well as an overall average, including coursework, of 40%. To pass the half units, 50% must normally be obtained in the lab half-unit and 43% in the programming half-unit.

Second Year

In Mathematics, students offer three compulsory half-units and one half-unit option. Coursework contributes 10% to Mathematics half-units.
In Computing, students offer one compulsory full unit and one optional full unit. The compulsory Computing full unit comprises examination and coursework in Software Engineering - Design and Operating Systems, together with laboratory work. The optional Computing full unit comprises examination and coursework in three Computing courses selected from a specified list of options. Coursework is weighted as one-seventh of the examination/coursework contribution for each Computing course.
Students must obtain three units in total in order to enter the third year. To pass each Mathematics half-unit 30% is required. To pass the compulsory Computing full unit an examination average of 40% is normally needed and an overall average, including coursework, of 43%. To pass the optional Computing full unit, an average of 40% in the examination is normally required, with at least two marks at 30% or more, and 40% overall average, including coursework.

Third Year BSc

Students must offer seven half-unit options, of which at least two must be chosen from Computing and at least two from Mathematics. The remaining three options may include a non-language Humanities course from a specified list. There is a group project in Computing in term 1 and an individual project from either Computing or Mathematics in terms 2 and 3, which together contribute to an eighth half-unit, which has enhanced weighting. The group project contributes one quarter and the individual project three-quarters of this half-unit.

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Each half-unit, except the project half-unit, comprises examination and coursework. Coursework contributes 10% to Mathematics half-units and is weighted as one-seventh of the examination/coursework contribution for each Computing course.
To pass each Mathematics half-unit 30% is required. To pass each Computing half-unit 40% overall is needed. The project half-unit is weighted as if it was 0.9 full unit. (i.e., it counts 1.8 x other third year half-units.)
To obtain an honours degree students must obtain nine units in total over the three years.

Third Year MSci

Students must offer eight half-units, of which two are compulsory, at least two more must be chosen from Computing and at least two more from Mathematics. One of the options may be a non-language Humanities course from a specified list. There is a group project in Computing in terms 1 and 2 and a group project from Mathematics in terms 2 and 3, which together contribute additional marks equivalent to approximately one-half unit.
Each normal half-unit comprises examination and coursework. Coursework contributes 10% to Mathematics half-units and is weighted as one-seventh of the examination/coursework contribution for each Computing course.
To pass each Mathematics half-unit 30% is required. To pass each Computing half-unit 40% overall is needed. To enter the fourth year students must normally obtain three units.

Fourth Year MSci

Students must offer seven half-units, of which at least two must be chosen from Computing and at least two from Mathematics. One of the options may be a non-language Humanities course from a specified list. There is a final project half-unit including an individual project from either Computing or Mathematics, which has enhanced weighting.
Each half-unit, except the project half-unit, comprises examination and coursework. Coursework contributes 10% to both Mathematics and Computing half-units.
Mathematics options chosen in the fourth year must be offered as an M4 unit with advanced study, when this is made available.
To pass each Mathematics half-unit 30% is required. To pass each Computing half-unit 40% overall is needed. The project half-unit is weighted as if it was 0.75 full unit. (i.e., it counts 1.5 x other fourth year half-units.)
To obtain an honours degree students must obtain twelve units in total over the four years.

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First year

The first year of study on both the BSc and MSci courses follows the same curriculum. All courses are compulsory. There is a substantial amount of practical computing work in both the Mathematics and Computer Science disciplines. Teaching is via a mixture of lectures, tutorials and project work.

There are two terms of lectures and structured laboratory work. The third term is taken up with examinations and project work. The outline structure is given below.

Term 1	Term 2	Term 3
Mathematics	*Mathematics*	*Mathematics*
Compulsory:	*Compulsory:*	
Foundations, Analytic Methods and Analysis	Analysis I	
Geometry and Linear Algebra	Linear Algebra	
Mathematical Methods		
Computing	*Computing*	*Computing*
Compulsory:	*Compulsory:*	*Compulsory:*
Declarative Programming 1 (JMC)	Programming II	PROLOG Introduction
Logic	Reasoning about Programs	
Programming I (JMC)		
Terms 1 and 2	Terms 2 and 3	Terms 1, 2 and 3
Computer Systems		Laboratory I

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Second year

The second year of study on both the BSc and MSci courses follows the same curriculum. Some of the courses are compulsory and some optional. There is a substantial amount of practical computing work in both the Mathematics and Computer Science disciplines. Teaching is via a mixture of lectures, tutorials and project work.

There are two terms of lectures and structured laboratory work. The third term is taken up with examinations and project work. The outline structure is given below.

Term 1	Term 2	Term 3
Mathematics	*Mathematics*	*Mathematics*
Compulsory:	*Options from:*	
Probability and Statistics I	Graphs, Algorithms and Optimisation	
Options from:	Nonlinear Equations and Unconstrained Optimisation	
Numerical Analysis I	Rings and Fields	
Groups, Rings and Numbers		
Computing	*Computing*	*Computing*
Compulsory:	*Options from:*	
Software Engineering - Design I	Assured Software	
Operating Systems	Artificial Intelligence I	
Options from:	Concurrent Programming	
Algorithms, Complexity and Computability	Software Engineering - Design II	
Compilers		
Terms 1 and 2	Terms 2 and 3	Terms 1, 2 and 3
		JMC2 Laboratory Laboratory Workshop

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Third year

In the final year, BSc students take seven option courses including at least two, but no more than five, technical courses from each Department, selected from the wide range of topics given below. One of the seven options *may* also be a non-language Humanities course. In addition students complete an individual project.

In their third year, MSci students must take eight courses including the Computing course: *Software Engineering Methods* and the Mathematics course: *Probability and Statistics II*. Their six options must include at least two other technical courses from each Department, selected from the topics given below. One of the six options *may* also be a non-language Humanities course. In addition students complete a group project in both disciplines.

Many of the courses have recommended or compulsory prerequisites. Students are given guidance in planning their third year programme as an integrated whole.

Term 1	Term 2	Term 3
Mathematics	*Mathematics*	*Mathematics*
Applied Probability	Algebraic Number Theory	
Computational Linear Algebra	Biostatistics	
Design of Experiments and Surveys	Discrete Mathematics	
Elementary Number Theory	Finite Element Method	
Finite Difference Methods for Partial Differential Equations	Galois Theory	
Group Theory	Games, Risks and Decisions	
Linear Algebra and Matrices	Graphs, Algorithms and Optimisation	
Numerical Solution of Ordinary Differential Equations	Modern Statistical Methods	
Probability and Statistics II *(compulsory for MSci)*	Nonlinear Equations and Unconstrained Optimisation	
	Optimisation	
	Rings and Fields	
	Statistical Modelling I	

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Term 1	Term 2	Term 3
Mathematics	*Mathematics*	*Mathematics*
	Stochastic Simulation	
	Survival Models and Actuarial Applications	
	Starting a New Venture (available to final year students only)	
	Time Series	
Computing	*Computing*	*Computing*
Advances in Artificial Intelligence	Advanced Computer Architecture	
Advanced Databases	Computational Finance	
Compilers	Computer Networks and Distributed Systems	
Computational Logic	Concurrent and Distributed Programming	
Knowledge Management Techniques	Databases	
Operations Research	Decision Analysis	
Quantum Computing	Graphics	
Simulation and Modelling	Introduction to Bioinformatics	
Software Engineering - Methods *(compulsory for MSci)*	Performance Analysis	
The Practice of Logic Programming	Robotics	
	Starting a New Venture	

Term 1	Term 2	Term 3
Computing	*Computing*	*Computing*
	Type Systems for Computing Languages	
Terms 1 and 2	Terms 2 and 3	Terms 1, 2 and 3
Humanities		Individual Project (compulsory)

.Fourth year

Fourth year MSci students take seven courses in all, including at least two technical courses from each Department, and complete an individual project in an area of their choice. The courses are selected from a wide range of advanced options available at fourth year within the two Departments from the lists given below. A large proportion of the Mathematics courses come both in M3 and M4 versions. MSci fourth year students would normally take the M4 version.

Many of the courses have recommended or compulsory prerequisites. Students are given guidance in planning their fourth year programme as an integrated whole.

Term 1	Term 2	Term 3
Mathematics	*Mathematics*	*Mathematics*
Computational Linear Algebra *	Optimisation *	
Numerical Solution of Ordinary Differential Equations *	Finite Element Method *	
Finite Difference Methods for Partial Differential Equations *	Galois Theory *	
Group Theory *	Algebraic Number Theory *	

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Term 1	Term 2	Term 3
Mathematics	*Mathematics*	*Mathematics*
Group Representation Theory *	Discrete Mathematics *	
Elementary Number Theory *	Number Theory: Elliptic Curves	
Riemann Surfaces	Ring Theory	
Groups and Representations	Mathematics in Molecular Biology	
Representation Theory of Symmetric Groups	Games, Risks and Decisions *	
Design of Experiments and Surveys *	Stochastic Simulation *	
Applied Probability I *	Modern Statistical Methods	
Time Series *		
Linear Algebra and Matrices *		
Term 1	**Term 2**	**Term 3**
Computing	*Computing*	*Computing*
Advanced Issues in Object Oriented Programming	Advanced Computer Architecture	
Advanced Operations Research	Advanced Graphics and Visualisation	
Computer Vision	Automated Reasoning	
Intelligent Data and Probabilistic Inference	Complexity	
Modal and Temporal Logic	Computing for Optimal Decisions	
Models of Concurrent Computation	Computer Networks and Distributed Systems	

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Term 1	Term 2	Term 3
Computing	*Computing*	*Computing*
Natural Language Processing	Domain Theory and Exact Computation	
Network Security	Knowledge Representation	
Program Analysis	Multi-Agent Systems	
Software Engineering - Environments	Parallel Algorithms	
	Performance Analysis	
	Starting a New Venture	
Terms 1 and 2	**Terms 2 and 3**	**Terms 1, 2 and 3**
Humanities		Individual Project (compulsory)

* Fourth year students are expected to choose the "with advanced study" M4 version of these courses

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1.5 The Information Systems Engineering Degrees

Details of Joint Courses Offered Within the Department

Information Systems Engineering Degrees

Computer Engineering, Communications and Electronics

The Information Systems Engineering (ISE) course is a single Honours course run jointly by staff from the Department of Electrical and Electronic Engineering and the Department of Computing. Its objective is to educate students in the theoretical and practical aspects of the design and implementation of modern information systems. This requires graduates to be fully conversant with state-of-the-art techniques in electronics, communications and computing.

The information era is well and truly with us and has brought with it a rapidly growing demand for graduates with a balanced education in both Computing and Electrical Engineering. The ISE course is specifically designed to provide key education in both disciplines. Graduates of the course bring with them expertise in a range of core topics including software engineering, electronics, signal processing, control engineering, computer architecture, communications technology, networking, databases and human-computer interaction

Courses List for ISE, 1st Year

Course Code	Course Type	Course Title
E1.1	Compulsory	Analysis of Circuits
E1.11	Compulsory	Mathematics (I-stream)
E1.13	Compulsory	Introduction to Management
E1.15	Compulsory	Communication Skills
E1.2	Compulsory	Digital Electronics I
E1.4	Compulsory	Analogue Electronics I
E1.6	Compulsory	Communications I
E1.7	Compulsory	Software Engineeirng 1: Introduction to Computing
E1.8	Compulsory	Software Engineering 1: Algorithms and data structures
E1.9	Compulsory	Principles of Computers and Software Engineering
LAB.I1C	Compulsory	ISE1 Computing Lab
LAB.I1E	Compulsory	ISE1 Electronics Lab
PRJ.I1	Compulsory	ISE1 Project

Courses List for ISE 2nd Year

Course Code	Course Type	Course Title
PRJ.I2	Compulsory	ISE2 Project
LAB.I2E	Compulsory	ISE2 Electronics Lab
LAB.I2C	Compulsory	ISE2 Computing Lab
E2.6	Compulsory	Control Engineering
E2.5	Compulsory	Signals and Linear Systems
E2.4	Compulsory	Communications II
E2.16	Compulsory	Managerial Economics (I-stream)
E2.15	Compulsory	Language Processors (I-stream)
E2.14	Compulsory	Operating Systems 2 (I-stream)
E2.13	Compulsory	Computer Architecture (I-stream)
E2.12	Compulsory	Software Engineering 2: Object-orientated SE and real-time and internet programming (I-stream)
E2.11	Compulsory	Mathematics 2 (I-stream)
E2.1	Compulsory	Digital Electronics II
E1.15	Compulsory	Communication Skills

Courses List for ISE 3rd Year BEng

Course Code	Course Type	Course Title
ISE3.1	Compulsory	Human-Computer Interaction
ISE3.2	Compulsory	Databases
ISE3.3	Optional	Communication Systems
ISE3.5	Optional	VHDL and Logic Synthesis
ISE3.7	Optional	Mathematics for Signals and Systems
ISE3.8	Optional	Software Engineering Methods
ISE3.9	Optional	Control Engineering
ISE3.11	Optional	Digital Signal Processing

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Course Code	Course Type	Course Title
ISE3.12	Optional	Multimedia Systems
ISE3.14	Optional	Distributed Systems
ISE3.16	Optional	Graphics
ISE3.17	Optional	Advanced Signal Processing
ISE3.18	Optional	Simulation and Modelling
ISE3.19	Optional	Digital System Design
ISE3.22	Optional	Operations Research
ISE3.23	Optional	Artificial Intelligence
ISE3.25	Optional	Robotics
ISE3.26	Optional	Advanced Computer Architecture
ISE3.27	Optional	Concurrent and Distributed Programming
ISE3.30	Optional	Computational Finance
ISE3.31	Optional	Communication Networks
ISE3.34	Optional	Advanced Knowledge Management Techniques
ISE3.36	Optional	Introduction to Bioinformatics
ISE3.M1	Optional	Accounting
ISE3.M2	Optional	Project Management
ISE3.M3	Optional	Information Management
ISE3.M8	Optional	Starting a New Venture
H.01	Optional	Philosophy I
H.04	Optional	Ethics of science and technology
H.05	Optional	European history: 1870-1989
H.06	Optional	Politics
H.07	Optional	History of science
H.08	Optional	History of technology History of Technology History of Technology
H.09	Optional	History of medicine
H.10	Optional	Modern literature and drama
H.11	Optional	Art and nature
H.12	Optional	Music and Western Civilisation
H.13	Optional	Communication of Scientific Ideas
H.14	Optional	Science, Communication and Society

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Course Code	Course Type	Course Title
H.15	Optional	Humanities essay
H.17	Optional	Roman History
ML3 - 13	Optional	Foreign Language
PROJFIN	Compulsory	Project:final year
PRJ.I3	Compulsory	ISE3 BEng Project

Course Code	Course Type	Course Title
ISE3.1	Compulsory	Human-Computer Interaction
ISE3.2	Compulsory	Databases
ISE3.3	Compulsory	Communication Systems
ISE3.5	Optional	VHDL and Logic Synthesis
ISE3.7	Optional	Mathematics for Signals and Systems
ISE3.8	Optional	Software Engineering Methods
ISE3.9	Optional	Control Engineering
ISE3.11	Optional	Digital Signal Processing
ISE3.12	Optional	Multimedia Systems
ISE3.14	Optional	Distributed Systems
ISE3.16	Optional	Graphics
ISE3.17	Optional	Advanced Signal Processing
ISE3.18	Optional	Simulation and Modelling
ISE3.19	Optional	Digital System Design
ISE3.22	Optional	Operations Research
ISE3.23	Optional	Artificial Intelligence
ISE3.25	Optional	Robotics
ISE3.26	Optional	Advanced Computer Architecture
ISE3.27	Optional	Concurrent and Distributed Programming
ISE3.30	Optional	Computational Finance
ISE3.31	Optional	Communication Networks
ISE3.34	Optional	Advanced Knowledge Management Techniques
ISE3.36	Optional	Introduction to Bioinformatics
ISE3.M1	Optional	Accounting

Course Code	Course Type	Course Title
ISE3.M2	Optional	Project Management
ISE3.M3	Optional	Information Management
H.01	Optional	Philosophy I
H.04	Optional	Ethics of science and technology
H.05	Optional	European history: 1870-1989
H.06	Optional	Politics
H.07	Optional	History of science
H.08	Optional	History of technology History of Technology History of Technology
H.09	Optional	History of medicine
H.10	Optional	Modern literature and drama
H.11	Optional	Art and nature
H.12	Optional	Music and Western Civilisation
H.13	Optional	Communication of Scientific Ideas
H.14	Optional	Science, Communication and Society
H.15	Optional	Humanities essay
H.17	Optional	Roman History
ML3 - 61	Optional	Foreign Language
PRJ.IE	Optional	Industrial Elective (IE) Project
PRJ.J3	Compulsory	ISE3 MEng Project

Courses List for ISE 4th Year MEng

Course Code	Course Type	Course Title
ISE4.2	Optional	Computer Vision
ISE4.3	Optional	Mobile Radio Communication
ISE4.4	Optional	Advanced Databases
ISE4.5	Optional	Management of Telecommunication Networks and Services
ISE4.7	Optional	Digital Signal Processing and Digital Filters
ISE4.8	Optional	Multi-agent Systems
ISE4.10	Optional	Parallel Algorithms
ISE4.11	Optional	Advanced Communication Theory

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Course Code	Course Type	Course Title
ISE4.14	Optional	Network Security
ISE4.15	Optional	Coding Theory
ISE4.16	Optional	Software Engineering Environments
ISE4.17	Optional	Speech Processing
ISE4.18	Optional	Custom Computing
ISE4.19	Optional	Introduction to Digital Integrated Circuit Design
ISE4.20	Optional	Computing for Optimal Decisions
ISE4.21	Optional	Discrete-time Systems and Computer Control
ISE4.23	Optional	Design of Linear Multivariable Control Systems
ISE4.24	Optional	Natural Language Processing
ISE4.25	Optional	Fuzzy Systems
ISE4.27	Optional	Stability and Control of Non-linear Systems
ISE4.29	Optional	Analysis of Neural Network Models
ISE4.33	Optional	Digital Image Processing
ISE4.36	Optional	Optical Communication
ISE4.37	Optional	Advanced Operations Research
ISE4.40	Optional	Advances in Artificial Intelligence
ISE4.41	Optional	Systems Identification
ISE4.42	Optional	Automated Reasoning
ISE4.43	Optional	Synthesis of Digital Architectures
ISE4.44	Optional	Quantum Computing
ISE4.46	Optional	Advanced Graphics and Visualisation
ISE4.48	Optional	Intelligent Data and Probabilistic Inference
ISE4.50	Optional	Performance Analysis
ISE4.52	Optional	Grid Computing
ISE4.M4	Optional	National Economy
ISE4.54	Optional	Complexity
ISE4.M5	Optional	International Business
ISE4.M6	Optional	Marketing
ISE4.M7	Optional	Business Strategy
ISE4.M8	Optional	Starting a New Venture
H.01	Optional	Philosophy I

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Course Code	Course Type	Course Title
H.04	Optional	Ethics of science and technology
H.05	Optional	European history: 1870-1989
H.06	Optional	Politics
H.07	Optional	History of science
H.08	Optional	History of technology History of Technology History of Technology
H.09	Optional	History of medicine
H.10	Optional	Modern literature and drama
H.11	Optional	Art and nature
H.12	Optional	Music and Western Civilisation
H.13	Optional	Communication of Scientific Ideas
H.14	Optional	Science, Communication and Society
H.15	Optional	Humanities essay
H.17	Optional	Roman History
ML3 - 61	Optional	Foreign language
PRJ.J4	Compulsory	ISE4 MEng Project
PROJFIN	Compulsory	Project: final year

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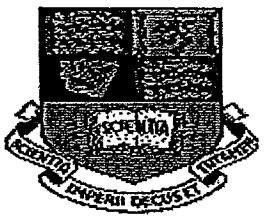

1.6 Student Workload and its Distribution Throughout the Year

Subject	No of Lectures	Tutorials	Laboratories	Students on Course	Total Contact Hours	Student Load
Computer Systems	30	10		112	4480	0.06817006
Databases 1	20	10		112	3360	0.051127545
Declarative Programming I	30	10		112	4480	0.06817006
Discrete Mathematics I	20	5		112	2800	0.042606287
Hardware	20	10		112	3360	0.051127545
Laboratory - Programming and Hardware		26	156	112	20384	0.310173773
Laboratory Support 1	20			112	2240	0.03408503
Logic	20	5		112	2800	0.042606287
Mathematical Methods and Graphics	30	20		112	5600	0.085212575
Programming I	30	15		112	5040	0.076691317
Reasoning about Programs	20	10		112	3360	0.051127545
Personal Programming Tutorials		20		112	2240	0.03408503
Personal Maths Tutorials		20		112	2240	0.03408503
Personal Tutoring		10		112	1120	0.017042515
					0	0
					0	0
					0	0
					0	0
Students are expected to take one option from below list:					0	0
Foreign Language I	40			9	360	0.005477951
Directions	12	6		103	1854	0.028211449
					65718	
						1
Total Contact Hours	65718					
Computing	0.937714					
Maths (2/3 Maths and Graphics)	0.056808					
Humanities	0.005478					
	1					

Computing Year 1 2001/2 Student Load

Subject	No of Lectures	Tutorials	Laboratories	Students on Course	Total Contact Hours	Student Load
Algorithms, Complexity and Computability	20	10		107	3210	0.05726
Compilers	20	10		107	3210	0.05726
Databases I	20	10		107	3210	0.05726
Laboratory Support	20			107	2140	0.038173
Laboratory Specification and Design		20	120	107	14980	0.267214
Networks and Communications	20	10		107	3210	0.05726
Operating Systems II	20	10		107	3210	0.05726
Software Engineering - Design I	20	10		107	3210	0.05726
Software Engineering - Design II	20	10		107	3210	0.05726
Statistics	20	10		107	3210	0.05726
Design Project	18	12		107	3210	0.05726
					0	0
					0	0
					0	0
Students expected to take 3 optional courses					0	0
					0	0
Architecture II	60	30		93	8370	0.149304
Artificial Intelligence I					0	0
Computational Techniques					0	0
Concurrent Programming					0	0
Operational Semantics					0	0
					0	0
Students taking 2 options plus	40	20		14	840	0.014984
					0	0
Foreign Language II	40	20		14	840	0.014984
Total Hours					56060	
						1
Computing	0.92203					
Mathematics (all of stats and 1/10 of Soft Eng. Des. 2)	0.062986					
Humanities	0.014984					
	1					

Computing Year 2 2001/2 Student Load

Subject	No of Lectures	Tutorials	Laboratories	Students on Course	Total Contact Hours	Student Load
Laboratory - Group Projects		20	30	45	2250	0.112472
Management - Organisation and Finance	20	10		45	1350	0.067483
Software Engineering - Methods	20	10		45	1350	0.067483
Individual Project and Presentation		50	30	45	3600	0.179955
Students are expected to choose 6 options (see below)					0	0
	120	60	90	0	0	0
Advanced Computer Architecture					0	0
Advanced Databases					0	0
Advances in Artificial Intelligence					0	0
Computational Logic					0	0
Computational Finance					0	0
Custom Computing					0	0
Decision Analysis					0	0
Distributed Systems					0	0
Graphics					0	0
Multimedia Systems					0	0
Operations Research					0	0
Performance Analysis					0	0
Quantum Computing					0	0
Robotics					0	0
Simulation and Modelling					0	0
The Practice of Logic Programming					0	0
Type Systems for Programming Languages					0	0
					0	0
Students Taking 5 options plus one of	100	50	75	45	10125	0.506123
Humanities	60			2	120	0.005999
Humanities (non-language)	20			8	160	0.007998
Starting a New Venture (Management)	30			35	1050	0.052487
				Total	20005	1
Computing	0.899775					
Humanities	0.013997					
Management (1/2 org and Finance)	0.086228					
	1					

BEng 3 Computing 2001/2 Student Load

Subject	No of Lectures	Tutorials	Laboratories	Students on Course	Total Contact Hours	Student Load
Industrial Placement Presentation and Report	10			65	650	0.048725637
Industrial Placement Presentation and Visit		5		65	325	0.024362819
Laboratory - Group Projects		20		65	1300	0.097451274
Management - Organisation and Finance	20	10		65	1950	0.146176912
Software Engineering - Methods	20	10		65	1950	0.146176912
Technical Presentations Skills	3	10		65	845	0.063343328
					0	0
Students must take 6 optional courses see below	120	60	105	0	0	0
					0	0
Advanced Computer Architecture					0	0
Advanced Databases					0	0
Advances in Artificial Intelligence					0	0
Computational Finance					0	0
Computational Logic					0	0
Custom Computing					0	0
Decision Analysis					0	0
Distributed Systems					0	0
Graphics					0	0
Multimedia Systems					0	0
Operations Research					0	0
Performance Analysis					0	0
Quantum Computing					0	0
Robotics					0	0
Simulation and Modelling					0	0
The Practice of Logic Programming					0	0
Type Systems for Programming Languages					0	0
					0	0
Students Taking 5 options plus one of	100	50	90	22	5280	0.395802099
Humanities	60			15	900	0.067466267
Humanities (non-language)	20			7	140	0.010494753
				Total	13340	1
Management (1/2 Org and Fin)	0.073088456					
Humanities	0.077961019					
Computing	0.848950525					
	1					

MEng Year 3 2001/2 Student Load

Subject	No of Lectures	Tutorials	Laboratories	Students on Course	Total Contact Hours	Student Load
Industrial Placement - Presentation and Report		15		68	1020	0.034859877
Individual Projects and presentation		10	60	68	4760	0.162679426
Project Outsourcing Exercise		50	10	68	4080	0.139439508
					0	0
Students take 8 courses, see below	160	80	90	14	4620	0.157894737
					0	0
Advanced Graphics and Visualisation					0	0
Advanced Issues in Object Oriented Programming					0	0
Advanced Operations Research					0	0
Automated Reasoning					0	0
Complexity					0	0
Computer Vision					0	0
Computing for Optimal Decisions					0	0
Custom Computing					0	0
Domain Theory and Exact Computation					0	0
Intelligent Data and Probabilistic Inference					0	0
Knowledge Representation					0	0
Management - Economics and Law					0	0
Modal and Temporal Logic					0	0
Models of Concurrent Computation					0	0
Multi-agent Systems					0	0
Natural Language Processing					0	0
Network Security					0	0
Parallel Algorithms					0	0
Program Analysis					0	0
Project Outsourcing Exercise					0	0
Quantum Computing					0	0
Software Engineering - Environments					0	0
					0	0
Students taking 7 courses plus humanities/Management	100	50	90	54	12960	0.442925496
Humanities (Language)	60			9	540	0.018455229
Humanities (not-Language)	20			7	140	0.004784689
Starting a New Venture (Management)	30			38	1140	0.038961039
				Total	29260	1
Computing	0.937799					
Humanities	0.02324					
Management (starting a New Venture)	0.038961					
	1					

MEng Computing Year 4 2001/2 Student Load

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1.7 Assessment Methods

1.7 Assessment methods

Assessment Methods - 2002/3 entrants

The assessment of student performance is by examination and coursework. This assessment is in four parts (three for the BEng Computing course), one for each year. Each part consists of a group of formal written papers and assessment of laboratory, course and project work submitted throughout the year.

Students on MEng Computing (European Programme of Study) are assessed during their final year based on their performance in project work, coursework and examinations at their receiving institution.

BEng Computing - 2002/3 entrants

Year 1

Lecture Courses:

Course Code	Description
	Autumn Term
112	*Hardware*
113	*Computer Systems*
120.1	*Declarative Programming I*
121	*Programming I*
140	*Logic*
142.1	*Discrete Mathematics I*
145	*Mathematical Methods and Graphics*
Course Code	Description
	Spring Term
113	*Computer Systems*
123	*Programming II*
130	*Databases*
142.2	*Discrete Mathematics II*
145	*Mathematical Methods and Graphics*

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Year 2

Lecture Courses:

Course Code	Description
	Autumn Term
211	*Operating Systems II*
220	*Software Engineering - Design II*
221	*Compilers*
240	*Algorithms Complexity and Computability*
245	*Statistics*
252	*Foreign Language*
Course Code	Description
	Spring Term
210	*Architecture II*
212	*Networks and Communications*
222	*Software Engineering - Design II*
223	*Concurrent Programming*
231	*Artificial Intelligence I*
233	*Computing Techniques*
242	*Assured Software*
252	*Foreign Language*

NB Not all options may be offered every year.

Examinations:

All examinations, except for Foreign Language II, are of two hours duration.
Students must take examinations in subjects 211, 212, 220, 221, 222, 240 and 245.
Three subjects are selected from subjects 210, 223, 231, 233, 242 and 252.

Total 20 hours (or 18 hours plus the language assessment).

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Coursework:

Each lecture course has assessed coursework associated with it.
There is also supporting laboratory work, which is assessed.

Marks:

Ten two-hour examinations (each contributing 120):	1200
Laboratory work:	200
Coursework:	200
Project work:	100
Total marks:	*1700*

Requirements:

In order to pass the Part II examination and qualify to progress to the third year, the candidate must satisfy the following conditions:

(a) achieved at least 40% in the coursework;
(b) achieved at least 40% in the laboratory work;
(c) achieved at least 40% in the aggregate of written papers;
(d) achieved at least 30% in each of at least nine written papers.

Supplementary Qualifying Tests:

At the discretion of the Examiners, Supplementary Qualifying Tests may be offered to a candidate who marginally fails to achieve the conditions laid down for a pass in the Part II Examination.

Year 3

Students will be offered a choice of courses from the approved course list. Students take eight options, including compulsory professional material, each of which is examined either by a written paper by essay/coursework. Students participate in a group project and must also submit an individual project.

Coursework:

Each lecture course has assessed coursework associated with it.
There is also supporting project work which is assessed.

Marks:

Eight two-hour examinations (each contributing 180):	1440
Coursework:	240
Group Project:	200
Individual Project:	670
Total marks:	*2550*

Honours Classification:

The marks for all components of the three years of the course are aggregated into an overall mark. The class of Honours awarded depends on this overall mark, with the proviso that candidates must normally have achieved at least 50% overall in Part III and at least 30% in their individual project.

For each year, the total possible marks are:

Year 1 total:	850
Year 2 total:	1700
Year 3 total:	2550
Total over 3 years:....	*5100*

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MEng Computing - 2002/3 entrants

Year 1

Lecture Courses:

Course Code	Description
	Autumn term
112	*Hardware*
113	*Computer Systems*
120.1	*Declarative Programming I*
121	*Programming I*
140	*Logic*
142.1	*Discrete Mathematics I*
145	*Mathematical Methods and Graphics*
Course Code	Description
	Spring term
113	*Computer Systems*
123	*Programming II*
130	*Databases 1*
141	*Reasoning about Programs*
142.2	*Discrete Mathematics II*
145	*Mathematical Methods and Graphics*
Course Code	Description
	Summer term
120.2	*Declarative Programming I*

In addition, students select either *Future Directions in Computing* or a foreign language

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Examinations:

Subjects 112, 123, 130, 140, 141 and 142.1 and 142.2 each have written papers of 1.5 hours duration.

Subjects 113 and 145 have written papers of two hours duration.

Subjects 120.1 and 121 are examined by practical examinations.

Total duration of written examination papers: 13 hours.

Coursework:

Each lecture course has assessed coursework associated with it.

There is also supporting laboratory work which is assessed.

Marks:

Six 1.5-hour examinations (each contributing 60):	360
Two two-hour examinations (each contributing 80):	160
One three-hour practical examination	60
One 1.5-hour practical examination	30
Laboratory work:	100
Coursework:	100
Project work or language option:	40
Total marks:	*850*

Requirements:

In order to pass the Part I examination and qualify to progress to the second year, the candidate must satisfy the following conditions:

(a) achieved at least 40% in the coursework;
(b) achieved at least 40% in the laboratory work;
(c) achieved at least 40% in the aggregate of written papers;
(d) achieved less than 30% in no more than one examination.

Supplementary Qualifying Tests:

At the discretion of the Examiners, Supplementary Qualifying Tests may be offered to a candidate who marginally fails to achieve the conditions laid down for a pass in the Part I Examination.

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Year 2

Lecture Courses:

Course Code	Description
	Autumn Term
210	*Architecture II*
211	*Operating Systems II*
220	*Software Engineering - Design I*
221	*Compilers*
240	*Algorithms, Complexity and Computability*
245	*Statistics*
252	*Foreign Language II*
Course Code	**Description**
	Spring Term
212	*Networks and Communications*
222	*Software Engineering - Design II*
223	*Concurrent Programming*
231	*Artificial Intelligence I*
233	*Computational Techniques*
242	*Operational Semantics*
252	*Foreign Language II*

NB Not all options may be offered every year.

Examinations:

All examinations, except for Foreign Language II, are of two hours duration.
Students must take examinations in subjects 211, 212, 220, 221, 222, 240 and 245.
Three subjects are selected from subjects 210, 223, 231, 233, 242 and 252.

Total 20 hours (or 18 hours plus the language assessment).

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Coursework:

Each lecture course has assessed coursework associated with it.
There is also supporting laboratory work which is assessed.

Marks:

Ten two-hour examinations (each contributing 120):	1200
Laboratory work:	200
Coursework:	200
Project work:	100
Total marks:	*1700*

Requirements:

In order to pass the Part II examination and qualify to progress to the third year, the candidate must satisfy the following conditions:

(a) achieved at least 40% in the coursework;
(b) achieved at least 40% in the laboratory work;
(c) achieved at least 40% in the aggregate of written papers;
(d) achieved at least 30% in each of at least nine written papers.

In addition, to qualify for the third year of the MEng degree in Computing, students must obtain an overall mark of at least 55% on their Part II total.

Supplementary Qualifying Tests:

At the discretion of the Examiners, Supplementary Qualifying Tests may be offered to a candidate who marginally fails to achieve the conditions laid down for a pass in the Part II Examination.

Year 3

Students will be offered a choice of courses from the approved course list. Students take eight options, including compulsory professional material, each of which is examined by tests. Students also participate in a group project.

Coursework:

Each lecture course has assessed coursework associated with it.
There is also supporting project work which is assessed.

Marks:

Eight tests (each contributing 150):	1200
Coursework:	240
Group Project with Technical Writing:	260
Total marks:	*1700*

Requirements:

In order to secure a place on the MEng degree course a student must pass the Group Project submitted in the Autumn Term of the third year. Failure in this component of the course will ordinarily lead to discussion and negotiation about transfer to the BEng degree for the remainder of the third year.
To pass Part III and qualify for the fourth year students must obtain an overall mark of at least 50%. Furthermore, they need to obtain a combined mark of at least 50% in their laboratory work, coursework and projects.

Year 4

Students will be offered a choice of courses from the approved course list. Students take eight options, each of which is examined either by a written paper or by essay/coursework. Students must submit an outsourcing report and an individual project, and must also give an individual presentation.

Coursework:

Each lecture course has assessed coursework associated with it.
There is also supporting project work which is assessed.

Marks:

Eight examinations (each contributing 240):	1920
Coursework:	240
Industrial Placement:	100
Outsourcing Exercise:	200
Individual Project:	940
Total marks:	*3400*

Honours Classification:

The marks for all components of the four years of the course are aggregated into an overall mark. The class of Honours awarded depends on this overall mark, with the proviso that candidates must have achieved at least 40% overall in Part IV and normally at least 40% in their individual project.
In addition to these requirements, candidates are normally expected to successfully complete the MEng degree programme in four continuous years.

For each year, the total possible marks are:

Year 1 total:	850
Year 2 total:	1700
Year 3 total:	1700
Year 4 total:	3400
Total over 4 years:....	*7650*

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1.8 Tutorial and Pastoral Arrangements

1.8 Tutorial and Pastoral Arrangements

Tutorial Support

1. Courses eligible for Support

Compulsory courses are allocated a certain number of helpers for the tutorial sessions (on a ratio of 30 students per helper, including the lecturer, with variations depending on previous years needs). These allocations can be retrieved by consulting the appropriate entry in the Departmental Database.
Optional courses are, in general, not allocated helpers, unless historical records show the option to be popular and hence an initial estimate number of helpers are assigned. Once the term starts, if the lecturer needs (more) helpers, then a request is made to the Tutorial Support Coordinator, clearly stating the number of students attending.

Each Laboratory Organiser will look after the provision of the required number of Lab demonstrators according to the expected number of students and the nature of the various laboratory exercises.

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2. Instructions for Lecturers and Lab Organisers

When Helpers are allocated for a particular course, Lecturers are expected to contact them and arrange a group meeting. The purpose of the meeting is to welcome everyone and to encourage a useful dialogue between the helpers in order to plan and organise future student tutorials.

During this meeting introductions are made and the team are welcomed. The Lecture will explain how he or she expect the tutorials to run and a general discussion and planning session will follow.

All members of the Department that act as tutorial assistants/lab demonstrators will have been trained by the Department before they engage in such activities.

Helpers are also expected to assist in the marking of assessed coursework and to participate in the formulation of precise guidelines for the marking schema. Once marked all coursework is returned to the Lecturer for moderating.

Finally the Lecturer is expected to monitor the performance of the helper throughout the term; if the person proves to be unsuitable or unsatisfactory he or she is expected to contact the relevant Tutorial Support Coordinator with a view to finding a replacement.

3. Teaching Associates.

Teaching Associates are at present, requested by the Department to provide academic help (without extra remuneration) with one course per term: a total of 10 tutorials plus the marking of the corresponding assessed coursework. This requirement is part of their contractual duties; the non-fulfilment of this obligation is considered to be a breach of contract, incurring disciplinary measures.

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4. Research Assistants.

At present, Research Assistants are requested by the Department to provide academic help (without extra remuneration) with one course per term: a total of 10 tutorials plus the marking of the corresponding assessed coursework. This requirement is part of their contractual duties; the non-fulfilment of this obligation is considered a breach of contract, incurring disciplinary measures.

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5. Students.

Students are asked to volunteer as helpers in exchange for payment.
By committing themselves to helping out with the tutorials (and also lab sessions) they are expected to meet the same standard of dedication of any other member of staff.

Personal Programming Tutor (PPT)

Objectives of the PPT Programme

These are primarily:
To help 1st-year students with their understanding of their programming courses, namely

Programming I and II (Java)
Declarative Programming I (Haskell)

And to provide constructive feedback on their laboratory assignments, which it is the Tutor's job to mark.

How it is organized

The Tutor is allocated a small number of 1st-year students, forming a PPT group. The Tutor's group will normally remain fixed.

He or she will hold 50-minute classes with their group, one per week during the Autumn and Spring terms, at a time of day agreed between the Tutor and their students.

PPT classes should take place in the Tutor's room unless they have insufficient space or privacy. If so they are expected to book an alternative room for their classes. In this Session it is expected that each group will have about 8-9 students.

Tutor Helpers

If the Tutor wishes someone to act as their recognized helper they are expected to contact the First Year Coordinator. This is so the Coordinator can keep track of the "Continuous Assessment Tracking Engine (CATE)" mark-submission process and make judgements as to the suitability of helpers.

Assessment Procedure

The students submit their laboratory assignments electronically.
On the day following submission the Tutors will receive by email the results of auto tests applied to their students' assignments, together with listings of their programs. The Tutor marks the assignments and returns them to the students in their next suitable PPT class. The tests are then discussed.

The official schedules for the submission of these assignments are published on the pages Autumn schedule and Spring schedule. The mark the Tutor awards to each assignment must be an integer in the range 0-10, and should represent a balanced evaluation of design approach and coding style as well as algorithm quality and correctness.

Personal Mathematics Tutor (PMT)

Objectives of the PMT Programme

These are primarily:
to help 1st-year students with their understanding of their mathematical courses, namely
140 Logic
141 Reasoning about Programs
142 Discrete Mathematics
and to provide constructive feedback on their coursework assignments, which it is the Tutor's job to mark.

How it is organized

The tutor is allocated a small number of 1st-year students, forming a PMT group. Their group will normally remain fixed.
They hold 50-minute classes with their group, once per week during the Autumn and Spring Terms.

They are at liberty to agree with the students in their group that their PMT classes be held at a time different from that shown on the timetable.
PMT classes should take place in the tutor's room unless they have insufficient space or privacy. In that event book an alternative room for their classes. In this Session it is expected that each group will have about 8-9 students.

Tutor Helpers

If the Tutor wishes someone to act as their recognized helper they are expected to contact the First Year Coordinator. This is so the Coordinator can keep track of the Continuous Assessment Tracking Engine (CATE) mark-submission process and make judgements as to the suitability of helpers.

Assessment Procedure

The Tutor collects the submitted coursework from the Student Administration Office (SAO) in Room 345 on Level 3.

The students hand in their coursework to the SAO on Tuesdays. The SAO staff will normally have distributed it to the Tutor's personalised pigeonhole in the SAO a day or so afterwards. The Tutor takes it away, marks it and returns it to the students in their next suitable PMT class and discusses it with them.
The official schedules for the issue, hand-in and return of courseworks are published on the Department of Computing web pages "Autumn schedule" and "Spring schedule".

The mark the Tutor awards to each piece of coursework must be an integer in the range 0-5. Marks and should be entered on the web as soon as practicable.

Some courseworks may take the form of mini-tests sat during the standard large-class tutorials associated with the lecture courses. Again, these will eventually reach the Tutor via the SAO and the Tutor will likewise mark and return them to the students.

Besides finding the students' courseworks waiting in their pigeonholes, the Tutor will also find the relevant question sheets and solutions, and perhaps also copies of relevant lecture notes. Some lecture notes will be available on the web and downloadable via links on the 1st-year Home Page.

Monitoring the Students

The Tutors are expected to Inform both the "First Year Coordinator" and the "Senior Tutor" of (a) absentees from their classes and (b) students who are consistently failing to submit work or are performing very poorly.

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1.9 Undergraduate Exam Papers

1.9 Undergraduate Exam Papers

Please see Appendix for samples

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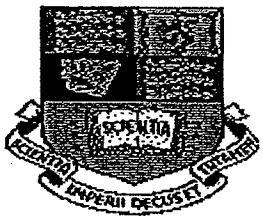

1.10 Availability of Resources

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1.11 Academic Staff Activities, Development and Appraisal

The facilities comprise of two purpose built, configurable studios - Studio A and Studio B - that contain state-of-the-art computing and audio-visual capabilities.

A key element of the studios is a full complement of software and system production tools.

"Smartboards" in both studios facilitate interactive presentations, using software tools and multimedia presentations, including video, stereo sound and DVD. Whiteboards and flip-pads are also available. The studios are an integrated and versatile environment, suitable for a wide range of events.

Atlas

Atlas cluster at LeSC is funded through a HEFCE JREI grant (GR/M92355) to support a Computational Fluid Dynamics consortium at Imperial College. The Quadrics interconnect links 16 DS20 (dual 667MHz processors, 2GB RAM) through a low latency and high bandwidth network capable of an MPI latency of 5.5us and a bandwidth of over 210MB/s. The cluster operating system is Tru64 Unix and the resources are managed through Quadrics' Resource Management System (RMS).

Pioneer

The Pioneer cluster is funded through an EPSRC Equipment Grant 2001 and provided by Workstations UK Ltd. The 20 1GHz Athlon processors with 500Mb memory are managed by Sun's Grid Engine (an open source scheduling system) running in a Redhat 7.1 Linux environment. The processors are linked through a 100Mbit commodity network.

The AP3000

The AP3000 is an 80 processor distributed memory cluster running Solaris 2.6. The cluster is managed through a proprietary Networking Queuing System (NQS). The APNet from Fujistu provides an optimised Message Passing Interface (MPI) and Parallel Virtual Machine (PVM) implementation.
The AP3000 is funded through a 1996 HEFCE JREI award GR/L26100.

Viking

The Viking cluster within LeSC is the first phase of a £2M investment to support applied computational scientists across Imperial College. Its primary users will be the Bioinformatics and High Energy Physics and Computational Engineering communities within the College

These application communities are characterised by their high throughput and high performance computing needs. Viking as 64 dual Xeon nodes each with 2GB RAM connected by Myrinet and 68 dual Xeon nodes (34 nodes with 2GB RAM and 34 nodes with 1GB RAM) connected using Fast Ethernet. The cluster uses a specialised Redhat Linux distribution and the nodes are accessed through Sun Grid Engine on hardware provided by Compusys.

The Systems Engineering Studios

The Systems Engineering Studios provide an infrastructure for delivering advanced education and training in systems engineering with special attention to systems requirements engineering. This includes training in associated communication, facilitation and group working skills.

Specification: Dual Pentium III 866MHz, 1GB RAM.
Function: shared apps server.
news - SuSE 7.2

Specification: Compaq ProLiant 1600R Pentium II 300MHz, 320MB RAM, 100GB and 2x18GB disks.
Function: news server.
db - SuSE 7.2

Specification: Dual Pentium III 1GHz, 1GB RAM.
Function: database server.
print - RedHat 6.2

Specification: Intel U160, 256MB RAM, 2x18GB disks.
Function: printing server.
grouse - SuSE 7.2

Specification:
Function: student projects.

Supercomputers

The Department is home to the high performance computing facilities of the Imperial College Parallel Computing Centre. These currently consist of an 80-node Fujitsu AP3000 massively parallel server, a Fujitsu VX vector processor, and a 16-node Alpha cluster, with several more projects under development, e.g. a 30-node Dell Windows cluster. Students doing individual projects may be granted access to these facilities by their supervisors.

Access Grid

The Access Grid node at the London e-Science Centre is located in the Department of Computing at Imperial College. The Access Grid uses a mixture of opensource and commercial software technology to enable global collaborations within the e-Science community.

Saturn

Saturn is a 24 750MHz UltraSparcIII processor Sun E6800 with 36GB memory. It is funded through a 2000 HEFCE JREI grant (GR/R04034/01) to build an Informatics Grid across Imperial College. The high performance shared memory server has 6TB of attached RAID disk space and 24TB of near-line tape space.

Linux login servers
There are three new servers:

***cpu1* - SuSE 7.2**
***cpu2* - SuSE 7.2**
***cpu3* - SuSE 7.2**

Specification: Dual 2.2GHz XEON CPUs (hyperthreaded giving the appearance of 4 CPUS), 2GB RAM, single 1Gb network connection.

Function: remote login.
Windows 2000 domain servers
jackdaw - Windows 2000

Specification: Dell PowerEdge 2450 - Pentium III 860MHz, 512MB RAM.

Function: domain controller.
vulture - Windows 2000

Specification: Dell PowerEdge 2450 - Pentium III 860MHz, 512MB RAM.

Function: domain controller.
File servers
The following servers perform various functions for DoC users.
falcon - Solaris 8.0

Specification: Sun Enterprise 220R.

Function: file server and NT samba server.
seagull - SuSE 7.2

Specification: Intel U160, 512MB RAM, 2x18GB disks.

Function: production WWW server.
albatross - SuSE 7.2

Specification: Intel U160, 512MB RAM, 2x18GB disks.
Function: test and project WWW server.
linux - SuSE 7.2

Package list for SuSE 7.2 Linux Cont.

Xrdb is used to get or set the contents of the X resource Database, these allow you to modify the look and feel of your display. You would normally run this program from your X startup file.

xset

This program is used to set various user preference options of the display, including mouse speed, bell pitch and duration, autorepeat settings etc.

xsetroot

The setroot program allows you to tailor the appearance of the background ("root") window on a workstation display running X. Normally, you experiment with xsetroot until you find a personalized look that you like, then put the xsetroot command that produces it into your X startup file.

There are a number of tools which can be used to manage projects and debug programs.

Revision Control System - RCS

rcs

This manages multiple revisions of files. RCS is recommended for all projects, especially projects involving multiple authors.
For further information, see the separate guide.

Software Debugging Tools

gdb

This is the GNU debugger, it is supports debugging in C, C++ and Modula-2. It has a text interface, and is command line driven.

xxgdb

This is an X-windows interface to the gbd debugger.

Make Utilities

make

Make is used to maintain, update, and regenerate related programs and files. It automates the process of bringing files up to date, and is essential for most projects, by reducing the edit-compile cycle, and by ensuring that all compile dependancies are maintained.

makedepend

Create dependencies in makefiles.

imake

A C preprocessor interface to the make utility.

xmkmf

Simple interface to the imake utility, for generating X11 Makefiles.

Package list for SuSE 7.2 Linux Cont.

Xfig is a menu-driven tool that allows the user to draw and manipulate objects interactively in an X window.

xload

The xload program displays a periodically updating histogram of the system load average. Load is defined as the average number of runnable processes on the system. In general, the higher the load, the slower your processes will run.

xlock

xlock locks the X server till the user enters their password at the keyboard. While xlock is running, all new server connections are refused. The screen saver is disabled. The mouse cursor is turned off. The screen is blanked and a changing pattern is put on the screen. If a key or a mouse button is pressed then the user is prompted for the password of the user who started xlock. This can be run from the Start menu.

xman

Xman is a manual page browser. The default size of the initial xman window is small so that you can leave it running throughout your entire login session. In the initial window there are three options: Help will pop up a window with online help, Quit will exit, and Manual Page will pop up a window with a manual page browser in it. You may pop up more than one manual page browser window from a single execution of xman.

xterm

The xterm program is a terminal emulator for the X Window System. It provides DEC VT102 and Tektronix 4014 compatible terminals for programs that can't use the window system directly.

xv

The xv program displays images in the GIF, JPEG, TIFF, PBM, PGM, PPM, X11 bitmap, Utah Raster Toolkit RLE, PDS/VICAR, Sun Rasterfile, BMP, PCX, IRIS RGB, XPM, Targa, XWD, possibly PostScript, and PM formats on workstations and terminals running the X Window System.

Utilities

xwd

Xwd is an X Window System window dumping utility. Xwd allows X users to store window images in a specially formatted dump file. This file can then be read by various other X utilities for redisplay, printing, editing, formatting, archiving, image processing, etc. The target window is selected by clicking the mouse in the desired window. The keyboard bell is rung once at the beginning of the dump and twice when the dump is completed.

xwud

Xwud is an X Window System image undumping utility. Xwud allows X users to display in a window an image saved in a specially formatted dump file, such as produced by xwd.

xmodmap

The xmodmap program is used to edit and display the keyboard modifier map and keymap table that are used by client applications to convert event keycodes into keysyms. It is usually run from the user's session startup script to configure the keyboard according to personal tastes.

xrdb

Package list for Windows 2000 Cont.

Windows Services for UNIX 5.20
Xemacs-21.4.5-clean
XVI32 2.2
Xilinx 4.1
XnView 1.31

Package list for SuSE 7.2 Linux.

xbiff
The xbiff program displays a little image of a mailbox. When there is no mail, the flag on the mailbox is down. When mail arrives, the flag goes up and the mailbox beeps. By default, pressing any mouse button in the image forces xbiff to remember the current size of the mail file as being the ``empty'' size and to lower the flag.
xcalc
Xcalc is a scientific calculator desktop accessory that can emulate a TI-30 or an HP-10C.
xclipboard
The xclipboard program is used to collect and display text selections that are sent to the CLIPBOARD by other clients. It is typically used to save CLIPBOARD selections for later use.
xclock
The xclock program displays the time in analog or digital form. The time is continuously updated at a frequency which may be specified by the user.
xdvi
Xdvi is a program which runs under the X window system. It is used to preview DVI files, such as are produced by TeX.
This program has the capability of showing the file shrunken by various (integer) factors, and also has a ``magnifying glass'' which allows one to see a small part of the unshrunk image momentarily.
xedit
A simple text editor.
editres
Editres is a tool that allows users and application developers to view the full widget hierarchy of any X Toolkit client that speaks the Editres protocol. In addition editres will help the user construct resource specifications, allow the user to apply the resource to the application and view the results dynamically. Once the user is happy with a resource specification editres will append the resource string to the user's X Resources file.
xeyes
This is a mouse demonstration program. A pair of eyes track your mouse around the desktop.
xfontsel
The xfontsel application provides a simple way to display the fonts known to your X server, examine samples of each, and retrieve the X Logical Font Description full name for a font.
xfig

Package list for Windows 2000 Cont

Java Web Start
Java2 SDK 1.4.0
KYRO
Kenya 2.0.0
Kenya 1.3.0
LTSA 2.1 2.1
Labelled Transition System Analyser 2.2
LeechFTP 1.3.1.207
LiveUpdate
MS SQL Server 2000 Tools 8.0.0
MSDN Library - October 2001
MSDN Library - Visual Studio 6.0a
Maple 7
MiKTeX 2.1
Microsoft Office 2000 SR-1 Disc 2 9.00.3821
Microsoft Office 2000 SR-1 Premium 9.00.3821
Microsoft PhotoDraw 2000 V2 2.00.00.1428
Microsoft Visual J++ 6.0
Microsoft Web Publishing Wizard 1.53
Mozilla 1.0
NVIDIA Windows 2000 Display Drivers
New Pandora 1.0.0
Norton AntiVirus Corporate Edition 7.5.0.0000
Opera 6.0
PFE 1.0.1
PMail-4.01
PowerArchiver 6.11
PowerVR Tools
PuTTY-devel-2001-12-17
QuickTime 5.0.2
RealPlayer 8
SQL Server DSN
Shockwave Player 8.5
Sicstus Prolog 3.8.6
Status Client 1.0.0
VNC 3.3.3r9
Visual Studio 6.0 Enterprise Edition (SP5) 6.0.5
Vtk 4.0 & tcl 8.3.4.3
WebFldrs 9.00.3501
Wget 1.0.0
WinOOT 3.0A 3.0.0
Winamp 2.76

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General notes:
At some times PCs may be allocated to specific students for project use and subsequently are no longer available for general access.

The configuration may vary slightly from the above on some machines.
Most systems have large CRT or flat panel LCD colour displays, and are networked via 100Mbps Ethernet. Zip drives are installed in all the *actives*, and approximately one in four of the other machines.

The *actives* have 3-D graphics cards.
The *syncs* and *texels* can be used for remote login.

Package list for Windows 2000.

This is a list of the software installed on standard Windows2000 systems in DoC.
A386 0.75
AMD Code Analyst 1.1.0
Active Disk
ActivePerl 5.6.1 Build 631 5.6.631
ActiveState ActivePython 2.1.1 Build 212 2.1.212
Adobe Acrobat Reader 5.0
Alloy Constraint Analyser 2.0.0
Blaxxun Contact
BlueJ 1.1.4
CSG Portgrabber 1.0.0
Cocomo II.1999.0
DK1.1
ESC Java 1.2.2 1.2.2
Eudora-5.1.1
EZ-Smart-5.0
Forte 3.0
GLut 3.7
GhostScript 6.01
GhostView 2.9
Hugs98 feb2001
Hugs98 vFeb2000 (with graphics-2.0.3)
Hummingbird Exceed V7.0 7.0.0.0
Intel(R) PRO Ethernet Adapter and Software
Iomega App Services
IomegaWare
Iomega-tools-3.1
JUnit 3.7
Java 2 Runtime Environment, SE v1.4.0_01

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Software engineering laboratory

The software engineering laboratory is an open laboratory housing a number of PCs and Unix workstations. It provides students with access to a wide range of software development tools. These include commercial software development tools (e.g. CASE tools for software specification, modelling, analysis and design), as well as research-oriented tools and environments emerging from industrial research laboratories and universities.

Details of the computing systems available for general use in the Student Labs are shown below. The labs are open from **8am to 11pm** including weekends.

Windows and Linux systems

These IC-outside workstations run two operating systems, Microsoft Windows 2000 and SuSE Linux 7.2.

Name(s)	Lab	Processor	RAM	Disk	OS
active01 to *active48*	202	Athlon 1.4GHz	512MB	60GB	Windows 2000, SuSE
dynamic01 to *dynamic32*	206	Pentium III 450MHz	256MB	60GB	Windows 2000, SuSE
fusion01 to *fusion20*	203	Pentium III 450MHz	128MB	20GB	Windows 2000, SuSE
quantum01 to *quantum16*	203	Pentium IV 2GHz	512MB	80GB	Windows 2000, SuSE
pixel01 to *pixel22*	203	Pentium III 667MHz or Athlon 700MHz	256MB	20GB	Windows 2000, SuSE
sync01 to *sync12*	219	Pentium IV 1.8GHz	512MB	80GB	SuSE
sync13 to *sync28*	219	Athlon 2.1GHz	512MB	80GB	SuSE
texel01 to *texel46*	219	Pentium IV 2GHz	512MB	80GB	SuSE
voxel01 to *voxel38*	219	Athlon 1.2GHz	256MB	20GB	Windows 2000, SuSE

1.10 Availability of Resources

Computing facilities

The Department provides all the facilities needed to carry out undergraduate and postgraduate study as well as academic research. There are three main teaching laboratories providing over two hundred general access PC workstations, another dedicated project lab with around fifty PCs allocated for project work, as well as a number of laptop docking points. Research groups within the department also have extensive resources, which may be used for project work. The desktop systems are connected by a state-of-the-art switched Gigabit Ethernet network, and supported by our growing racks of cutting edge servers.

All members of the Department are provided, free of charge, with file storage, email, web space, printing, and full internet access.
Full details on the current state of the systems can be found on the Computing Support Group web site: www.doc.ic.ac.uk/csg/

Teaching laboratories

The teaching labs provide general login access for student work, tutorials, and even exams with our pioneering Lexis system. Both Linux and Windows operating systems are supported, with an extensive range of software provided on both platforms to allow general use as well as supporting teaching and research. Specialist software like the Xilinx VLSI and FPGA design system, the Maple maths package, and the B Toolkit are installed, as well as general software like Microsoft Office, Sun StarOffice, Visual Studio, and the very latest Linux software. Most lab software is licensed for home use, and students can write a CD containing the current lab software on one of the CD-writers provided for student use. All lab machines are kept up to date through our rolling replacement scheme.

Hardware and Real-Time laboratory

This laboratory supports microcontroller-based projects involving a wide variety of hardware components and devices. A range of PCs is used to interface directly with equipment including robots, train sets and electronic simulators. Students can simulate real-time control systems using the laboratory's high performance 'in circuit emulators', once the code is tested it is downloaded into custom-built boards and other control interfaces. The latest field programmable gate array technology is used for experiments in vision.

Formicary.com Software Engineering Prize (Value £1050 per student)

There are two prizes awarded for excellent end of year examination performances in the Software Engineering domain. One prize is awarded to a first year student and the second is awarded to a second year student.

IBM Thinkpad Challenge (Value £50 per student)

Awarded to two Second Year project groups for best third term project

Nortel Scholarships (Value 6000 per student)

Awarded to students after relevant interview. Student receives £2000 per annum over three years.

Approximately twenty bursaries to a total of £60,000 are available from Andersen Business Consulting, both for near completing Computing undergraduates and for MSc in Computing Science students.

(Due to the current plight of this company these Bursaries are currently on hold)

The department is currently in negotiation with this company to set up two undergraduate prizes and a bursary.

spent and an account of each week's work detailing tasks, difficulties and achievements, and a conclusion outlining the skills acquired and lessons learned. The logbook should be signed on completion of the placement by the company placement supervisor or manager, who should inform us if this presents any concerns regarding confidentiality. A brief assessment by a company supervisor, of the student's contributions and achievements during the placement would be appreciated.
After the termination of the placement, during the autumn term of the fourth year, the students are required to give an oral presentation of 15 minutes duration. This should give an introduction to the company, describe the projects on which they worked and conclude with the lessons learnt and the experience gained. The company supervisor and/or other representatives of the company are very welcome to attend these presentations.

The logbook and the oral presentation are assessed by the personal tutor and the mark contributes to the overall coursework mark for the forth year of the course.

Work Permits

Overseas students no longer require Work Permits for an industrial placement.

However, we are aware that some companies will not consider employing a student for placement if he/she requires a work permit in the longer term, because the company regards placement students as potential graduate recruits. We are also aware that some placements may be with companies involved in defence contracts, which impose nationality restrictions.

Industrial Sponsorship, Prize Money and Bursaries.

The department actively seeks student sponsorship from industry. This is mainly in the form of Prize Money or Bursaries. Below is a list of sponsors:

BT Project Prizes (Value £50 per student)
Awarded for excellence in group projects in the final years of the BEng and MEng Computing courses, and the third year of the MEng Information Systems Engineering course.

DST International Prize for excellence
(Value £500 per student)
Awarded to two Third Year students who demonstrate outstanding achievement.

	Terence	Labs.			
mbt99	Thomas, Mark	IBM UK Laboratories	Winchester	nd	nd
mt99	Tikilainen, Mikhail	Lehman Bros.	London	yg	yg
gt99	Tudur, Gwydion	IBM UK Laboratories	Winchester	dfg	dfg
rv99	Vagadiya, Ramesh	Credit Suisse	London	im	im
tw99	Wiffen, Timothy	Formicary	London	im	im
jw99	Wilk, Joseph	Amadeus	France	im	-
pgw99	Willoughby, Philip	IBM UK Laboratories.	Winchester	wjk	ft
rw99	Wood, Russell	CodePlay/Barclays	London	pgh	phjk
asw99	Wren, Alisdair	CodePlay	London	phjk	phjk
mhw99	Wu Matthew	MIK	London	herbert	tjs/herbert

Working conditions, payment and leave.

Normally, students would expect to be paid, and last year this ranged from 280 to 550 pounds per week. The College does not stipulate a rate of pay. They would reasonably expect holiday leave appropriate to six months employment.

We require the company to send the placement student a letter of appointment specifying pay, hours and the company rules and conditions. The student must reply within two weeks of receiving the offer.

Contact during the placement.

We endeavour to keep in touch with all the students during their placement. The student's personal tutor will make contact with the student's supervisor in the company and visit the student to assess his/her achievements, the quality of the placement and the company's assessment of the student. The tutor submits a report about their visit, which we use to update our records.

Assessment of the placement

Placement students are required to produce a written account of their work in the form of an engineering logbook describing their training and technical work. The logbook is expected to include a brief description of the organisation in which the placement was

ncm99	Maynard, Nicholas	IBM UK Laboratories	Winchester	im	phjk
dwm99	McBride, David	IBM UK Laboratories	Winchester	imh	imh
mrm99	Mellor, Michael	CodePlay/Barclays	London	wjk	phjk
fam99	Mir, Faraz	Nucoda	London	jj	jj
lm299	Miranda, Luis	Amadeus	France	mrc	mrc
apn99	Norman, Alexander	Barclays Capital	London	frk	frk
kro99	O'Keeffe, Karl	Volantia/Barclays Capital	London	mss	mss
mp99	Pabla, Maninderjit	Credit Suisse First Boston	London	wjk	wjk
jp99	Patel, Jaymin	IBM UK Laboratories.	Winchester	fs	ecl1
dp99	Pattanakriengkrai, Derek	Credit Suisse/?	London	mjs	sue
cjp99	Pearson, Christopher	Formicary	London	im	im
tmp99	Pierce, Timothy	HP Research Labs.	Bristol	imh	imh
jhr99	Ramlee, Jasmin	Philips Research Labs.	Redhill	scd	scd
rr199	Rawal, Rishaar	Credit Suisse	London	jnm	jnm
mr99	Rivero, Manuel	Actix Ltd.	London	frk	frk
ehr99	Rodrigues, Eduardo	Domain Dynamics Ltd.	Reading	jnm	jnm
rr99	Rughani, Raghu	IBM UK Laboratories	Winchester	phjk	phjk
ps99	Shah, Payal	Credit Suisse	London	yg	dfg
rss99	Sidhu, Ravi	Credit Suisse	London	iccp	iccp
jts99	Smith, James	TECC(now SeatBooker)	London	wjk	wjk
ct299	Tagoe, Christopher	Philips Research Labs.	Redhill	pgh	pgh
tt99	Tan, Peng	Philips Research	Redhill	frk	pgh

mjc99	Coulthurst, Michael	InforSense	London	sue	sue
ad99	Denton, Asa	Barclays Capital	London	fs	mss
rf99	Fernandes, Robin	IBM UK Laboratories	Winchester	ecl1	ecl1
gg199	Ganandran Gajen	Subterra	Preston	iccp	iccp
mjg00	Goodier, Matthew	Volantia/Barclays Capital	London	mrc	mrc
seg99	Green, Samuel	Domain Dynamics Ltd.	Reading	nd	jnm
rah99	Hayward, Robert	IBM UK Laboratories	Winchester	ft	ft
ooi99	Ibidunni, Olubunmi	HP Research Labs.	Bristol	fs	fs
awi99	Ince, Andrew	Illy Computer Systems	London	clh	clh
mwj99	Johnson, Matthew	TECC(now SeatBooker)	London	pgh	wjk
vaj99	Joseph, Vassu	UBS Warburg	London	jnm	br
ark99	Karmalkar, Anushka	Credit Suisse	London	scd	scd
lk99	Kellond, Lisanne	Barclays Capital	London	pg	pg
jtk99	Kerry, James	His People Christrian Ministries	South Africa	wjk	?
sfk99	Khalid, Sherjeel	IBM UK Laboratories	Winchester	mss	nd
hcl99	Leung, Hor	Credit Suisse	London	iccp	iccp
sml99	Leung, May	IBM UK Laboratories	Winchester	mrc	dfg
ecl99	Lung, Elaine	HP Research Labs.	Bristol	pg	imh
nam99	Martin, Nicholas	IBM UK Laboratories	Winchester	nd	nd
om99	Matthews, Oliver	Credit Suisse	London	dfg	dfg
pbm99	Matthews, Peter	Eurotherm	Worthing	phjk	jcp

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Administration

The Computing Department maintains links with industry and seeks new opportunities for placements. It co-ordinates applications from students and arranges interview times etc. Although it is usually preferable for the students to be interviewed at the company, the department can arrange for company representatives to meet and interview students in the College if this is more convenient.

Before recommending a particular placement to the students we try to ensure that the company will provide suitable projects and that the students will get adequate supervision by a qualified member of staff at the company.

The 2002 Placements.

There were 65 students on Industrial Placement from April to September 2002.

email	Student	Company	Location	Tutor	To Visit
aa1199	Agam, Avigail	Fujitsu	U.S.A.	mrc	klc
aja99	Ahern, Alexander	Barclays Capital	London	scd	pg
mza99	Alam, Mohammed Zeeshan	Teamphone	London	clh	clh
sa299	Ali, Somsuddin	Credit Suisse/?	London	mrc	jnm
ta599	Antonopoulos, Timos	The Foundry	London	clh	clh
aeb99	Barnell, Alexander	HP Research Labs	Bristol	fs	fs
rjb99	Bhavsar, Ritesh	Credit Suisse	London	pg	pg
ijb99	Buchanan, Iain	Credit Suisse	London	sue	sue
jjc99	Cadogan, Jonathan	Credit Suisse	London	scd	scd
rcc99	Caldas, Rui	Barclays Capital	London	frk	frk
jc99	Clapham, James	Beauchamp Financial Technology Ltd.	London	svb	svb
sac99	Coulson, Simon	UBSWarburg	London	br	br

1.12 Industrial Contacts and Participation

MEng Computing - Industrial Placements

The Course

The Department of Computing has been placing students on the four year course since 1986. Originally MEng Software Engineering, this course was modified in 1993 to provide an Integrated Study Scheme based around a common set of core courses with a variety of specialisations as follows:

MEng Computing
MEng Computing (Software Engineering)
MEng Computing (Mathematical Foundations)
MEng Computing (Computational Management)
MEng Computing (Artificial Intelligence)
MEng Computing (European Programme)

The Placement

The MEng programme consists of four years of study at college and six months of industrial training in the period beginning of April to the end of September, after the third year. So when the students start their industrial training they have completed three full academic years of instruction in computer science and software engineering principles. During this time they would have learnt and used a wide variety of programming languages and software tools.

Academically, these students are placed in the upper half of an already selected group of students, and, in general, are both very capable and mature. Our experience, over the period that the programme has been running, has shown that these students can complete a substantial amount of technically high quality work and can assume a good degree of project responsibility.

The department looks for positions within Industry in which the student would be a member of a team of software professionals and thus would get some experience in real-life software engineering problems. The preference is for the student to be involved with one or two larger projects throughout their training period rather than being used as a programmer on a large number of smaller tasks.

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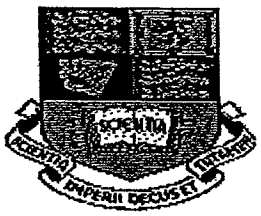

1.12 Industrial Contacts and Participation

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Department of Computing

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Dr. F. Toni ft@doc.ic.ac.uk

Logic-Based Multi-Agent Systems
Active and Deductive Databases
Abduction
Non-monotonic Reasoning
Argumentation
Constraint Logic Programming
Planning
Information Integration

Dr. S. van Bakel svb@doc.ic.ac.uk

Functional programming: Lambda calculus, term rewriting systems, term graph rewriting systems.
Type systems: intersection type assignment, polymorphic type assignment, decidable systems.
Type theory and theorem provers.
Semantics: filter models, approximation models, game theory.
Abstract interpretation: strictness analysis, uniqueness typing.

Dr. H. Wiklicky herbert@doc.ic.ac.uk

Quantitative Aspects of Programming Languages.
Program and Security Analysis.
Semantics of Probabilistic Programming Languages.
Applications of Operator Theory to Semantics.
Semantics of Quantum Computation.

Dr. G.-Z. Yang gzy@doc.ic.ac.uk

Computer Vision and Image Processing.
Perceptual Intelligence.
Visual Simulation and Augmented Reality.
Biomedical Imaging Systems.

The Department recognizes the importance of training and development for all staff and actively encourages staff to attend relevant personal development courses run by the College. It carries out annual reviews of its staff and runs a full appraisal scheme in line with College directives. New Staff are appointed a mentor who guides them through their probationary period. All staff are expected to attend at least five development courses annually to help them with their teaching.

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Dr. F. Sadri fs@doc.ic.ac.uk

Temporal reasoning.
Abduction.
Active logic databases.
Logic-based agents: agent archtiectures, proof procedures, logic-based negotiation between agents, communication in multi-agent systems.

Prof. M.J. Sergot mjs@doc.ic.ac.uk

Logic for knowledge representation in databases and artificial intelligence:temporal reasoning, default reasoning, representation of law.
Tools for the development of logic-based systems: including interactive programs, conditional answers, program transformation techniques.
Deonitic logic and its applications in computing science: legal knowledge representation, formal specification of computer systems, computer systems and human-computer interaction as normative systems.

Prof. M.S. Sloman mss@doc.ic.ac.uk

Tools and techniques for building distributed systems: architectures, programming languages, configuration of mobile and multimedia systems, distributed operating systems, communication mechanisms.
Programmable networks: how to produce adaptable networks and telecommunications systems which cater for mobility, multimedia services and pervasive computing.
Management of large inter-organisational distributed systems: monitoring, specification of management policy, quality of service management, security, configuration management, management interaction protocols, user interface design.

Dr. M.B. Smyth mbs@doc.ic.ac.uk

Topology in computer science - more specifically (not an exhaustive list): Connections between discrete mathematics (graph theory) and topology.
Generalized metrics: theory and applications.
Domain Theory. Constructive approaches: information systems, formal topology.
Digital topology and geometry (in relation to image processing).
Foundations of discrete geometry.

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Dr. I.C.C. Phillips iccp@doc.ic.ac.uk

Concurrency, in particular:
Formats for Process Algebra: orderings on operational rules.
Priority in Process Algebra.
Calculi for mobility, such as the Ambient Calculus.

Dr. D. Rueckert dr@doc.ic.ac.uk

Computer vision and graphics in medical imaging.
Augmented reality for computer assisted surgery.
Multimodality rigid and non-rigid registration.
Motion and deformation analysis in cardiac MRI.

Dr S.M. Rüger s.rueger@doc.ic.ac.uk

Multimedia Knowledge Management
Information Retrieval & Text Mining
Data Mining & Knowledge Discovery
Clustering & Classification
Artificial Intelligence & Machine Learning
Graphical Models & Boltzmann Machines
Artificial Neural Networks

Dr A. Russo ar3@doc.ic.ac.uk

Mathematical logic and its application to software engineering: logic for representing knowledge about software systems, logic-based techniques for analysing and developing software specifications, logic-based tools for supporting software engineering tasks.
Multi-perspective and distributed software specifications.
Abductive and inductive reasoning, with application to software engineering.
Labelled Deductive Systems.
Belief Revision.

Prof. B. Rustem br@doc.ic.ac.uk

Decision support systems: multi-objective decision making; integer programming and qualitative rule-based systems; computing methods for decision making in financial and economic systems.
Operations research: decision making under uncertainty; mean-variance and worst case design.
Numerical methods: solution of non-linear systems of equations, control systems design.
Mathematical programming: non-linear programming; minimax and game strategy algorithms; optimal control of non-linear discrete-time control systems.

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Prof. J.N. Magee jnm@doc.ic.ac.uk

Software Architecture: architecture description languages, dynamic architectures, analysis, performance.
Distributed Systems: reconfiguration, self-organisaton, adaptable systems, location services, availability, mobility, reliability, design tools and execution environments.

Dr. I. Maros im@doc.ic.ac.uk

Algorithm design: large scale linear, integer, mixed integer and network optimisation problems on serial and parallel computers.
Interface between computer science and operations research.
Data structures, numerical and non-numerical algorithms in optimisation systems, implementation technology.
Intelligent optimisation algorithms.
Applications: operations research, medical image reconstruction by optimization, finance decision modelling.

Dr. P. McBrien pjm@doc.ic.ac.uk

Heterogeneous Databases and Schema Integration
Distributed Systems Development
Temporal Databases
Default Databases
Business Rule & Process Modelling

Dr. J.A.McCann jamm@doc.ic.ac.uk

Systems architecture and performance of component-based and (self)-adaptive systems
Fine-grained componentisation of the Operating System
Systems software support for mobile and ubiquitous systems
Component-based database management system architectures
High performance information retrieval engines and agent-based systems

Prof. S.H. Muggleton shm@doc.ic.ac.uk

Inductive Logic Programming
Machine Learning applications in Molecular Biology
Intelligent adaptive agents
Natural language learning

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Department of Computing

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Prof. J. Kramer jk@doc.ic.ac.uk

Concurrent and distributed systems: software specification, design and analysis.
Software architectures: architectural description languages, specification and design techniques, dynamic structures.
Analysis: compositional techniques for behaviour modelling and analysis, model checking.
Requirements analysis: support for multiple perspectives (viewpoints), requirements evolution, inconsistency handling.

Mr. F.R. Kriwaczek frk@doc.ic.ac.uk

Logic-based tools for decision support systems.
Man-machine interfaces.
Agent-based web portals.
Constraint logic programming and its applications.

Prof. M.M. Lehman mml@doc.ic.ac.uk

Feedback, Evolution and Software Technology
Dynamics of Software Evolution
Component Based System Evolution
Evolution Resource Estimation
Formal Theory of Software Evolution

Dr. W. Luk wl@doc.ic.ac.uk

Parallel computers and embedded systems: architectures, development methods, programming languages, design tools and cost models, field-programmable devices.
Applications of such systems: robotics, multimedia, communications.
Theory and practice of developing systems containing: hardware and software; synchronous and asynchronous elements; run-time reconfigurable and partially reconfigurable gate arrays.

Dr. E.C. Lupu e.c.lupu@doc.ic.ac.uk

Network and Distributed Systems Management
Integrated Security Management
Design, Security and Mobility issues in Distributed Systems
Programmable Network Architectures

Department of Computing

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Dr. I.M. Hodkinson imh@doc.ic.ac.uk

Algebraic logic.
Dynamic logic.
Modal and temporal logic.
Finite model theory.

Dr. C.J. Hogger cjh@doc.ic.ac.uk

Theory and applications of logic programming.
User-friendly logic databases and logic-based interfaces.
Visual problem solving systems.
Logic programming and the Internet.
Program analysis and transformation.

Dr. M.R.A.Huth mrh@doc.ic.ac.uk

Semantics of Software Engineering Artifacts
abstraction techniques in model checking
three-valued model checking
reasoning about inconsistent systems
Security of Software Engineering Artifacts
security analysis of object-oriented Actor languages

Dr. P.H.J. Kelly phjk@doc.ic.ac.uk

High performance and parallel computing: architectures, languages, compilers, libraries, tools, operating systems.
Caches and cache coherency.
Software tools for adaptive computations, and run-time optimisation.
Performance engineering tools.

Dr. W. Knottenbelt wjk@doc.ic.ac.uk

Stochastic Performance Modelling with Petri nets, Queueing Networks and Process Algebras
Distributed Generation and Solution of Large Markov Models
Parallel Numerical Methods
Determining Response Time Distributions in Large Markov Models

Prof. R.A. Kowalski rak@doc.ic.ac.uk

Logic programming for knowledge representation and problem solving in artificial intelligence: temporal reasoning, meta-level reasoning, default reasoning, argumentation.
Deductive databases: integrity constraints.
Legal reasoning: the formalisation of rules, regulations, legislation.
Multi-agent systems.

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Dr. P. Gardner pg@doc.ic.ac.uk

Communication and Concurrency
Logic and Type Theory
Term and Graph Rewriting
Category Theory

Dr. D.F. Gillies dfg@doc.ic.ac.uk

Computer graphics and vision: the application of interactive computer graphics for teaching the skills required for medical endoscopy.
Modelling and prediction of the physical behaviour of the tongue during laryngoscopy.
Automatic characterisation of neural cell morphology from microscopic image.
Bayesian analysis of images.
Bayesian inference in high level vision.
Use of computer vision in automatic advisory and control systems for colon endoscopy.

Dr. Y. Guo yg@doc.ic.ac.uk

Development of distributed parallel data mining algorithms: scalable parallel induction algorithm for classification; knowledge synthesis in distributed learning; Parallel Bayesian inference model and Knowledge management of distributed information systems.
Structured parallel programming: coordination based parallel programming, coordination in distributed computing; domain specific parallel programming (financial modelling); coordination issues in distributed object computation.

Prof. C.L. Hankin clh@doc.ic.ac.uk

Program Analysis: foundations, algorithms, applications (optimising compilers, verification of critical systems, security).
Coordination languages: the chemical reaction metaphor, program transformations, program logics, program analysis, higher-order rewriting.

Prof. P.G. Harrison pgh@doc.ic.ac.uk

Stochastic models for the performance of parallel computer architectures and communication networks.
Synthesis of parallel algorithms by algebraic methods.
Stochastic process algebra.
Performance of ATM networks and distributed database systems.

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Dr. S. Drossopoulou scd@doc.ic.ac.uk

Programming language design, semantics and implementation
Object-oriented programming
Evolving software
Modules and types
Dynamic linking and loading and checking of code
The programming language Java

Dr. N. Dulay nd@doc.ic.ac.uk

Software Architectures: architecture description languages, dynamic reconfiguration, self-organising software, database architectures.
Internet Technologies: programming languages, interaction protocols, algorithms, security and cryptography, mobile services.

Prof. A. Edalat ae@doc.ic.ac.uk

Computer Arithmetic with Linear Fractional Transformations: Exact Computation of Elementary Functions, Roots, Fixed Points, Integrals, Semantics of Real Number Computation.
Computational Dynamical Systems: Iterated Function Systems, Fractal Geometry and Dimension Theory.
Domain-theoretic Models for Measures and the Riemann integral: Applications in Physics and Neural Nets.
Topology and Constructive Mathematics: Domain-theoretic Models of Topological Spaces.
Bisimulation in Probabilistic Processes on metric Spaces: Logical Characterization of Bisimulation.

Ms. S. Eisenbach se@doc.ic.ac.uk

The semantics of Java: the language, its type system and its programming environment.
Design of component based languages for multi-media.

Dr. A.J. Field ajf@doc.ic.ac.uk

Adaptive algorithms, particularly in computer graphics and computational science and engineering.
Parallel computer architecture and applications.
High-level programming languages for parallel computing.
The design and analysis of cache systems in shared-memory multiprocessors.
Analytical performance modelling of computer and communication systems.
Discrete-event simulation.
Functional programming languages, compilers and run-time systems.
DNA sequencing.

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Dr. P. Burger pb@doc.ic.ac.uk

Computer graphics and vision: reconstruction of three-dimensional scenes from two-dimensional shaded images.
Shape from shading, motion and texture.
Low level medical image filtering and reconstruction.
Flow line reconstruction in MR velocity maps.
MR and CT images of flow in the heart and major arteries.
Three-dimensional reconstruction and visualisation of blood flow in the heart.
Human-computer interfaces: intelligent interfaces for computer assisted teaching.

Prof. K.L. Clark klc@doc.ic.ac.uk

Design and implementation of distributed symbolic programming languages and concurrent OO languages.
The use of these languages for distributed AI, CSCW and Co-operative information systems applications.

Dr. S.M. Cox smc@doc.ic.ac.uk

Robotics: Distributed and parallel real-time control systems.
Sensors and radio communication systems.
Local and global positioning systems.
Telecommunication: Enhancing existing systems for remote control.
Micro-computer interfacing: reliability, control and experimentation.
Experiments for teaching: self-pacing, demonstrators and automatic evaluation systems.

Mr. R.J. Cunningham rjc@doc.ic.ac.uk

Communications in Multi-Agent Systems.
Agent cognition, learning and rationality.
Automated practical reasoning with modal and temporal logics.
Application to Multi-media Interface Agents for business and commerce, Robotic Systems and Natural Language Understanding.

Prof. J. Darlington jd@doc.ic.ac.uk

Parallel and high performance applications in science, engineering, medicine and commerce.
Parallel methods and high-level software technology.
Parallel machine design and performance modelling.
Economic models of electronic commerce.

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Software Architecture, Design and Analysis *Group leader:* Jeff Magee *Other academic members:* Naranker Dulay Susan Eisenbach Jeff Kramer	**Performance Modelling and Engineering** *Group leader:* Peter Harrison *Other academic members:* Tony Field William Knottenbelt		**Computational Bioinformatics** *Group leader:* Stephen Muggleton *Other academic members:* Marek Sergot	**Software Performance Optimisation** *Group leader:* Paul Kelly *Other academic members:* Tony Field Chris Hankin Wayne Luk **Software Process** *Group leader:* Manny Lehman

Dr. K.B. Broda kb@doc.ic.ac.uk

Theorem provers for non-standard logics using Labelled Deductive Systems (LDS), including substructural logics, modal logics and default logics.
Automated deduction: theorem proving using analytic tableaux and natural deduction.
Combining logics using LDS.
Abduction.
Control of theorem provers.
Software Engineering for Tele-reactive programs.
Knowledge extraction from neural networks.
Logic programming for software specification with UML and OCL.

Mr. D.R. Brough drb@doc.ic.ac.uk

Development of knowledge based tools to enhance learning and teaching.
Self Paced learning via multiple media and the web.
Artificial Intelligence to augment human abilities and make computers easier to use.
Software such as Excel and MS Help as environments for exploratory and expressive learning.
Logic Programming theory and application.

1.11 Academic Staff Activities, Development and Appraisal

The formal research structure of the Department is based on 16 research groupings consisting of academics, postdoctoral research associates and PhD students. These groupings are clustered together under five headings: Individual members of staff can be associated with one or more research grouping. The following matrix gives an indication of the main research areas of members of staff.

Distributed Software Engineering	High Performance Informatics	Interactive Media	Logic and Artificial Intelligence	Software Technology and Theory
Distributed Systems *Group leader:* Morris Sloman *Other academic members:* Naranker Dulay Jeff Kramer Emil Lupu Jeff Magee Peter McBrien Julie McCann **Requirements Engineering** *Group leader:* Jeff Kramer *Other academic members:* Alessandra Russo Jeff Magee	**Computational Management** *Group leader:* Berc Rustem *Other academic members:* Frank Kriwaczek Istvan Maros **Data Mining** *Group leader:* Yike Guo *Other academic members:* Stefan Rüger **Parallel Software** *Group leader:* John Darlington	**Custom Computing** *Group leader:* Wayne Luk *Other academic members:* Paul Kelly **Visual Information Processing** *Group leader:* Guang-Zhong Yang *Other academic members:* Duncan Gillies Daniel Rueckert	**Communicating Agents** *Group leader:* Jim Cunningham *Other academic members:* Keith Clark Stuart Cox Bob Kowalski **Computational Logic** *Group leader:* Marek Sergot *Other academic members:* Krysia Broda Ian Hodkinson Chris Hogger Bob Kowalski Frank Kriwaczek Fariba Sadri Francesca Toni	**Exact Computation** *Group leader:* Abbas Edalat **Programming Language Theory** *Group leader:* Chris Hankin *Other academic members:* Steffen van Bakel Sophia Drossopoulou Susan Eisenbach Philippa Gardner Michael Huth Iain Phillips Mike Smyth Herbert Wiklicky

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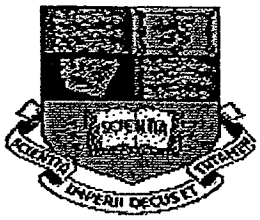

1.13 Student Demand for Courses

1.13 Student Demand for Courses

The undergraduate degrees offered by the department are heavily oversubscribed. Even with an entry criteria of three A levels at grade A or equivalent the number of applicants applying for a place on the relevant courses far outnumbers the number of places available. On average every Student accepted on an Undergraduate Computing course within the department has 29+ A level or equivalent points before entry.

In 2001 1351 applications were made for Computing courses, 407 of them coming from Overseas. 112 students took up places. This equates to 12 applications for every place taken up.

In 2002 the number of applications made for an undergraduate course was 1307 with 448 of those applications coming from overseas. 142 students eventually arrived on the course, 35 of them were non-UK applicants. This equates to just over 9 applications for every place offered.

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1.14 One Year Placement Abroad Programme

1.13 One Year Placement Abroad Programme

M.Eng (European Programme of Study) G402

A requirement of the M.Eng (European Programme of Study) is that students must spend their fourth year abroad at a participating institution. Students will take an approved selection of courses from the institution they are attending. These will be of the same overall standard as courses offered to other MEng Computing students and earn marks commensurate with those earned at Imperial College.

To qualify for the Year in Europe of the MEng Computing (European Programme of Study) a student must obtain a mark of at least 60% in Parts II and III, and must be accepted at a participating institution approved by the Department. Acceptance is usually dependent on recommendation by the Department, but this recommendation will only be made if the Department obtains assurances from appropriate authorities in the College, or participating institution, on the suitability of the student regarding the language of study, the available course options and any special needs of the student.

Students can receive financial support from the College for additional expenses accrued during this exchange year. Links to these European Institutions are maintained under the Erasmus Scheme. Below are some of the institutions we currently send our students to:

INP Grenoble
ENSIMAG

ENSIMAG
BP 72
F-38402 St Martin d'Hères

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Télécom Paris (école nationale supérieure des télécommunications)
46, rue Barrault - 75634 Paris Cedex 13

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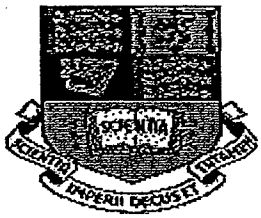
Imperial College of Science Technology and Medicine

Department of Computing

Undergraduate Studies Committee Report



1.15 Career Prospects for Graduates

1.15 Career Prospects for Graduates

Career opportunities

Computers are widely used in a great variety of industrial and commercial organisations and the demand for computing graduates far exceeds the supply. Thus there is a wealth of opportunities for new graduates seeking both creative and rewarding work. In addition to the major computer manufacturers and software houses, most large industries now write much of their own specialised software and many also design projects with embedded microprocessors; these include companies dealing in oil, chemicals, telecommunications, instruments, microelectronics, transport and aerospace.
For graduates with a commercial inclination there are many opportunities in areas such as management consultancy and accountancy. Employers range from small companies to large multi-nationals offering scope for work and travel abroad.

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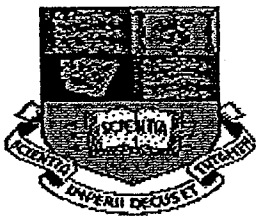

1.17 Destinations of Recent Cohorts

Main Activity	Employer	Work Description	Nature of Study	Location	Country	Course Name	Level	Domicile	Overseas	Department	Course code
01	Evolution	IT Consultant		EC1A		COMPUTING SCIENCE (MSC)	P	5826	N	COMP	G5U6
01		Technical Consultant		W14		COMPUTING SCIENCE (MSC)	P	5826	N	COMP	G5U6
01				EC4A		COMPUTING SCIENCE (MSC)	P	5826	N	COMP	G5U6
01	Schroders	IT Analyst		EC2V		COMPUTING SCIENCE (MSC)	P	5826	N	COMP	G5U6
01	Logica	Programmer		5826		COMPUTING SCIENCE (MSC)	P	5826	N	COMP	G5U6
01		Programmer		5826		COMPUTING SCIENCE (MSC)	P	5826	N	COMP	G5U6
01	Citigroup	Software Developer		E14		COMPUTING (RES COMPUTING)	P	5826	N	COMP	G5ZP
01		Software Engineer		WC2A		COMPUTING SCIENCE (MSC)	P	5826	N	COMP	G5U6
01	APR Ltd	Software Engineer		NW1		ADVANCED COMPUTING	P	5826	N	COMP	G5UO
01	Cramer Systems	Project Engineer		BA2		COMPUTING SCIENCE (MSC)	P	5826	N	COMP	G5U6
01	Barclays Capital	IT Analyst		E14		COMPUTING SCIENCE (MSC)	P	5826	N	COMP	G5U6
01	Morgan Stanley Dean Witter	Trader		E14		COMPUTING SCIENCE (MSC)	P	5826	N	COMP	G5U6
01		Applications Analyst		SW7		COMPUTING SCIENCE (MSC)	P	5826	N	COMP	G5U6
01	Logica	Computer		RG1		COMPUTING SCIENCE (MSC)	P	5826	N	COMP	G5U6
01	Telcordia Technologies	Systems Engineer		1771		COMPUTING SCIENCE (MSC)	P	7826	N	COMP	G5U6
01	Orbis Technology LTD	Software Developer		W4		ADVANCED COMPUTING	P	5826	N	COMP	G5UO
01	Cap Gemini Ernst & Young	Programmer		1718		COMPUTING SCIENCE (MSC)	P	5826	N	COMP	G5U6
01	Yes Television	Systems Engineer		CF1		COMPUTING SCIENCE (MSC)	P	6826	N	COMP	G5U6
01	Vodafone Group PLC	Computer Programmer		RG1		ADVANCED COMPUTING	P	5826	N	COMP	G5UO
01	IT Innovation	Analyst Developer		SO1		COMPUTING SCIENCE (MSC)	P	5826	N	COMP	G5U6
01	Yahoo	Software Engineer		5826		COMPUTING SCIENCE (MSC)	P	5826	N	COMP	G5U6
01	Trayport	Software Developer		SE16		COMPUTING SCIENCE (MSC)	P	5826	N	COMP	G5U6
01	Envisional	Software Engineer		CB1		ADVANCED COMPUTING	P	5826	N	COMP	G5UO
01		IT Consultant		EC1R		ADVANCED COMPUTING	P	5826	N	COMP	G5UO
01	Logica	IT Consultant		5826		COMPUTING SCIENCE (MSC)	P	5826	N	COMP	G5U6
01	Evolution	Java Programmer		1782		COMPUTING SCIENCE (MSC)	P	5826	N	COMP	G5U6
01	Telcordia Technologies	Systems Engineer		1771		COMPUTING SCIENCE (MSC)	P	5826	N	COMP	G5U6
01		Software Developer		5826		ADVANCED COMPUTING	P	5826	N	COMP	G5UO
01		Junior Developer		5826		COMPUTING SCIENCE (MSC)	P	5826	N	COMP	G5U6
01	Lehman Brothers	IT Analyst		EC2M		COMPUTING SCIENCE (MSC)	P	5826	N	COMP	G5U6
01	Symbian	Software Engineer		SE1		COMPUTING SCIENCE (MSC)	P	5826	N	COMP	G5U6
01	Customer Systems	Applications Consultant		TW20		COMPUTING SCIENCE (MSC)	P	5826	N	COMP	G5U6
01	Barclays Capital	Technology Analyst		E14		ADVANCED COMPUTING	P	5826	N	COMP	G5UO
01	Idetica	IT Consultant		GU1		COMPUTING SCIENCE (MSC)	P	5826	N	COMP	G5U6
01	SIFt PLC	Web Developer		BS1		COMPUTING SCIENCE (MSC)	P	5826	N	COMP	G5U6
01	Symbian	Software Engineer		W1A		COMPUTING SCIENCE (MSC)	P	5826	N	COMP	G5U6
01		Software Engineer		NW1		ADVANCED COMPUTING	P	5826	N	COMP	G5UO
01		Software Engineer		5826		COMPUTING SCIENCE (MSC)	P	5826	N	COMP	G5U6
01	Wallstreet Systems	Software Developer		EC4Y			P	5826	N	COMP	G5U6
01		Junior Programmer		5826		COMPUTING SCIENCE (MSC)	P	5826	N	COMP	G5U6
01	Accenture	IT Analyst		EC4N		COMPUTING SCIENCE (MSC)	P	5826	N	COMP	G5U6
02	Leatherman	Software Engineer		E14		ADVANCED COMPUTING	P	5826	N	COMP	G5UO
02	UBS Warburg	IT Analyst		EC2A		COMPUTING SCIENCE (MSC)	P	5826	N	COMP	G5U6
02	The Economist	Software Engineer		W1A		COMPUTING SCIENCE (MSC)	P	5826	N	COMP	G5U6
04	Imperial College	PhD	01	SW7		ADVANCED COMPUTING	P	5826	N	COMP	G5UO
04	Imperial College	PhD	01	SW7		COMPUTING SCIENCE (MSC)	P	5826	N	COMP	G5U6
04	Imperial College	PhD	01	SW7		ADVANCED COMPUTING	P	5826	N	COMP	G5UO
04	Imperial College	PhD	01	SW7		COMPUTING SCIENCE (MSC)	P	5826	N	COMP	G5U6
05		Unemployed				COMPUTING SCIENCE (MSC)	P	5826	N	COMP	G5U6
05		Seeking				ADVANCED COMPUTING	P	5826	N	COMP	G5UO

Main Activity	Employer	Work Description	Nature of Study	Location	Country	Course Name	Level	Domicile	Overseas	Department	Course code
05		Seeking				COMPUTING SCIENCE (MSC)	P	5826	N	COMP	G5U6
01	Application Networks	Computer Analyst		W1H			P	1703	Y	COMP	G5ZP
01	Imperial College	Research Assistant		SW7		COMPUTING (RES COMPUTING)	P	1656	Y	COMP	G5ZP
01	Imperial College	Post Doc		SW7			P	1619	Y	COMP	G5ZP
01	HSBC	Systems Analyst		1669			P	1669	Y	COMP	G5U6
01	Barclays Capital	IT Analyst		E14		COMPUTING SCIENCE (MSC)	P	1661	Y	COMP	G5U6
01	Kings College, London	Post Doc		SE5			P	1684	Y	COMP	G5ZP
01	Application Networks	Software Engineer		W1A			P	1702	Y	COMP	G5U6
01	Virgin	Java developer		WC2A		ADVANCED COMPUTING	P	1661	Y	COMP	G5UO
01	Application Networks	Software Engineer		W1A			P	1631	Y	COMP	G5U6
01		Technical Director, Fina		1631			P	1631	Y	COMP	G5UO
04	Imperial College	PhD	01	SW7		ADVANCED COMPUTING	P	1755	Y	COMP	G5UO
04		PhD	01	1661		ADVANCED COMPUTING	P	1661	Y	COMP	G5UO
04	UMIST	PhD	01	M60			P	1760	Y	COMP	G5UO
01	Lehman Brothers	Software Engineer		EC2A		COMPUTING (4YC:MENG)	U	5826	N	COMP	G501
01		Waiter		5826		COMPUTING (3YC BENG)	U	5826	N	COMP	G500
01	Digimobl Ltd	System Developer		SW11		COMPUTING (4YC:MENG)	U	5826	N	COMP	G501
01	Inforsense	Software Engineer		SW7		COMPUTING (3YC BENG)	U	5826	N	COMP	G500
01	UBS Warburg	IT Analyst		EC2A		COMPUTING (COMPUTATIONAL MANAGEMENT)	U	5826	N	COMP	G520
01	UBS Warburg	IT		EC2M		COMPUTING (COMPUTATIONAL MANAGEMENT)	U	5826	N	COMP	G520
01		Developer		E16		COMPUTING (4YC:MENG)	U	5826	N	COMP	G501
01		Administrator		EC2M		COMPUTING (4YC:MENG)	U	5826	N	COMP	G501
01	House of Fraser	Sales Assistant		GU1		COMPUTING (SOFTWARE ENGINEERING)	U	5826	N	COMP	G700
01	Frontier Software	Programmer		CB1		COMPUTING (4YC:MENG)	U	5826	N	COMP	G501
01	Barclays Capital	Analyst		E14		COMPUTING (4YC:MENG)	U	5826	N	COMP	G501
01	TEC Industry	Software Engineer		N17		COMPUTING (SOFTWARE ENGINEERING)	U	5826	N	COMP	G700
01	Thales Electronics	Software Engineer		RH11		COMPUTING (3YC BENG)	U	5826	N	COMP	G500
01	Deutsche Bank	Programmer		EC2A		COMPUTING (4YC:MENG)	U	5826	N	COMP	G501
01	Seisint	Software Developer		EC2R		COMPUTING (4YC:MENG)	U	5826	N	COMP	G501
01	Goldman Sachs	Associate		EC4A		COMPUTING (4YC:MENG)	U	5826	N	COMP	G501
01	Irisys	Systems Engineer		5826		COMPUTING (SOFTWARE ENGINEERING)	U	5826	N	COMP	G700
01	Beachamp Financial Technolo	Software Developer		EC4M		COMPUTING (SOFTWARE ENGINEERING)	U	5826	N	COMP	G700
01	New Voice Media	Computer Programmer		TQ1		COMPUTING (COMPUTATIONAL MANAGEMENT)	U	5826	N	COMP	G520
01	Digimobl Ltd	Applications Developer		SW11		COMPUTING (4YC:MENG)	U	6826	N	COMP	G501
01	IBM United Kingdom Limited	Software Engineer		SO21		COMPUTING (4YC:MENG)	U	5826	N	COMP	G501
01	Sony Manufacturing Company	Games Programmer		W1A		COMPUTING (4YC:MENG)	U	5826	N	COMP	G501
01	Barclays Capital	Analyst		E14		COMPUTING (SOFTWARE ENGINEERING)	U	5826	N	COMP	G700
01		Labourer		5826		COMPUTING (3YC BENG)	U	5826	N	COMP	G500
01	HSBC	Programmer		1669		COMPUTING (3YC BENG)	U	5826	N	COMP	G500
01	Deutsche Bank	Computer Programmer		EC2N		COMPUTING (3YC BENG)	U	6826	N	COMP	G500
01	Imperial College Union			SW7		COMPUTING (3YC BENG)	U	5826	N	COMP	G500
01	Barclays Capital	Analyst Computer		E14		COMPUTING (4YC:MENG)	U	5826	N	COMP	G501
01	Barclays Capital	Data Network Analysis		E14		COMPUTING (3YC BENG)	U	5826	N	COMP	G500
01		Programmer		TQ2		COMPUTING (SOFTWARE ENGINEERING)	U	5826	N	COMP	G700
01	Morgan Stanley Dean Witter	IT Programmer/Analyst		E14		COMPUTING (3YC BENG)	U	5826	N	COMP	G500
01	EDS	IT Consultant		BS34		COMPUTING (SOFTWARE ENGINEERING)	U	5826	N	COMP	G700
01	Exertris Ltd	Developer		SE1		COMPUTING (4YC:MENG)	U	5826	N	COMP	G501
01	Merrill Lynch	Finance Analyst		EC2Y		COMPUTING (COMPUTATIONAL MANAGEMENT)	U	5826	N	COMP	G520

Main Activity	Employer	Work Description	Nature of Study	Location	Country	Course Name	Level	Domicile	Overseas	Department	Course code
01	Barclays Capital	Analyst		E14		COMPUTING (SOFTWARE ENGINEERING)	U	5826	N	COMP	G700
01	Zebra Technologies	Internet developer		HP1		COMPUTING (4YC:MENG)	U	5826	N	COMP	G501
01	Ars Digita	Web Publisher		WC1		COMPUTING (4YC:MENG)	U	5826	N	COMP	G501
01	Barclays Capital	IT Analyst		E14		COMPUTING (4YC:MENG)	U	5826	N	COMP	G501
01	Lehman Brothers	Analyst		EC2M		COMPUTING (4YC:MENG)	U	5826	N	COMP	G501
01		Software Engineer		1669		COMPUTING (3YC BENG)	U	5826	N	COMP	G500
01	Applied Psychology Research	Software Engineer		NW1		COMPUTING (4YC:MENG)	U	5826	N	COMP	G501
01	Beauchamp Financial Technol	Consultant		EC4R		COMPUTING (COMPUTATIONAL MANAGEMENT)	U	5826	N	COMP	G520
04		MSc	02	1771			U	5826	N	COMP	G500X
04	Imperial College	PhD	01	SW7		COMPUTING (4YC:MENG)	U	5826	N	COMP	G501
04	Imperial College	PhD.	01	SW7		COMPUTING (SOFTWARE ENGINEERING)	U	5826	N	COMP	G700
04	University College, London	MSc	02	WC1E		COMPUTING (3YC BENG)	U	5826	N	COMP	G500
04	Southampton University	Diploma	03	SO17		COMPUTING (4YC:MENG)	U	5826	N	COMP	G501
04	Imperial College	PhD	01	SW7		COMPUTING (4YC:MENG)	U	5826	N	COMP	G501
04	Royal Holloway University	PhD	01	TW20		COMPUTING (4YC:MENG)	U	5826	N	COMP	G501
05		Unemployed				COMPUTING (3YC BENG)	U	5826	N	COMP	G500
05		Unemployed				COMPUTING (4YC:MENG)	U	5826	N	COMP	G501
05		Unemployed				COMPUTING (3YC BENG)	U	5826	N	COMP	G500
05		Unemployed				COMPUTING (4YC:MENG)	U	5826	N	COMP	G501
05		Unemployed				COMPUTING (3YC BENG)	U	5826	N	COMP	G500
05		Seeking				COMPUTING (3YC BENG)	U	5826	N	COMP	G500
05		Unemployed				COMPUTING (3YC BENG)	U	5826	N	COMP	G500
05		Seeking				COMPUTING (SOFTWARE ENGINEERING)	U	5826	N	COMP	G700
05		Unemployed/seeking				COMPUTING (3YC BENG)	U	5826	N	COMP	G500
05		Unemployed				COMPUTING (4YC:MENG)	U	5826	N	COMP	G501
06		Job starts march 2002				COMPUTING (4YC:MENG)	U	5826	N	COMP	G501
06		Travel				COMPUTING (4YC:MENG)	U	5826	N	COMP	G501
06		Starts new job in Feb 20				COMPUTING (3YC BENG)	U	5826	N	COMP	G500
06		Time Out				COMPUTING (3YC BENG)	U	5826	N	COMP	G500
06		Travelling				COMPUTING (3YC BENG)	U	5826	N	COMP	G500
06		Time Out				COMPUTING (4YC:MENG)	U	5826	N	COMP	G501
							U	1698	Y	COMP	G500X
01	Shell International Petroleum (	Trainee Manager		1698			U	1669	Y	COMP	G501
01	IBM United Kingdom Limited	Software Engineer		SO21			U	1661	Y	COMP	G501
01	Barclays Capital	Analyst		E14		COMPUTING (4YC:MENG)	U	1698	Y	COMP	G500X
01	Goldman Sachs	Analyst		EC4A			U	1614	Y	COMP	G500
04		MSc	02	1728		COMPUTING (3YC BENG)	U	1661	Y	COMP	G501
04	Imperial College	MSc	02	SW7		COMPUTING (4YC:MENG)	U	1698	Y	COMP	G700X
05		Unemployed					U	1653	Y	COMP	G500
06		Mission in German Chur				COMPUTING (3YC BENG)					

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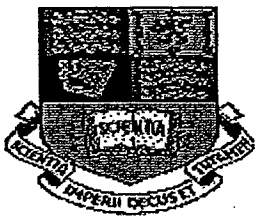

1.17 Distribution of Classes of Honours

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1.17 Distribution of Classes of Honours

Below are details of the 2000 – 2001

Undergraduate figures:

Description of Degree	1st	2.1	2.2	3	Pass
All Undergraduate Computing Degrees	26	53	17	2	5
All Undergraduate JMC Degrees	8	8	12	5	0

M.Eng Graduate figures:

Description of Degree	1st	2.1	2.2	3	DD
M.Eng Computing Science	11	22	5	0	1
M.Eng Systems Engineering	7	12	0	0	0
M.Eng European Programme	0	0	0	0	0
M.Eng Computational Management	1	6	3	0	0
M.Eng Artificial Intelligence	0	0	0	0	0
Total = 68 Students	19	40	8		1

DD = Deferred

B.Eng Graduate figures:

Description of Degree	1st	2.1	2.2	3	Pass	DD
B.Eng Computing Science	7	13	9	2	3	4
Total = 38 Students						

DD = Deferred

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B.Sci Joint Maths & Computing Graduate figures

Description of Degree	1st	2.1	2.2	3	Pass	DD
B.Sci JMC Degree	2	7	12	5	0	0
Total = 26 Students						

M.Sci Joint Maths & Computing Graduate figures

Description of Degree	1st	2.1	2.2	3	Pass	DD
M.Sci JMC Degree	6	1	0	0	0	0
Total = 7 Students						

Below are details of the 2001 – 2002 Academic Year

Undergraduate figures:

Description of Degree	1st	2.1	2.2	3	Pass
All Undergraduate Computing Degrees	39	38	23	4	2
All Undergraduate JMC Degrees	8	8	12	5	0

B.Eng graduate figures:

Description of Degree	1st	2.1	2.2	3	Pass	DD
B.Eng Computing Science	13	10	13	4	2	1
Total = 43 Students	13	10	13	4	2	1

DD = Deferred

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M.Eng graduate figures:

Description of Degree	1st	2.1	2.2	3	DD
M.Eng Computing Science	17	16	6	0	9
M.Eng Systems Engineering	8	9	2	0	0
M.Eng European Programme	1	0	0	0	0
M.Eng Computational Management	0	2	0	0	0
M.Eng Artificial Intelligence	0	1	2	0	0
Total = 73 Students	26	28	10	0	9

DD = Deferred

B.Sci Joint Maths & Computing Graduate figures

Description of Degree	1st	2.1	2.2	3	Pass	DD
B.Sci JMC Degree	7	6	7	2	0	0
Total = 22 Students						

M.Sci Joint Maths & Computing Graduate figures

Description of Degree	1st	2.1	2.2	3	Pass	DD
M.Sci JMC Degree	5	5	0	0	0	0
Total = 10 Students						

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1.18 Student Failure Rates

First Year undergraduate statistics 2001

Degree Title	No. Sat	Total no. failed	Can re-sit	No re-sit	% Failure rate
Artificial Intelligence	8	1	0	1	12.5%
Mathematical Foundations	1	0	0	0	00.0%
B.Eng Computing Science	34	2	2	0	05.9%
Computational Management	2	0	0	0	00.0%
European Programme	2	0	0	0	00.0%
Software Engineering	16	1	1	0	06.3%
M.Eng Computing Science	47	2	1	1	04.3%
Total	110	6	4	1	5.5%

Second Year undergraduate statistics 2001

Degree Title	No. sat	Total no. failed	Can re-sit	No re-sit	Required to transfer	% Failure rate
Artificial Intelligence	11	2	0	0	2	18.2%
Mathematical Foundations	0	0	0	0	0	0.00%
B.Eng Computing Science	32	4	2	2	0	12.5%
Computational Management	0	0	0	0	0	0.00%
European Programme	1	0	0	0	0	0.00%
Software Engineering	18	0	0	0	0	0.00%
M.Eng Computing Science	47	5	0	1	4	2.1%
Total	109	11	2	3	6	4.6%

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Third Year undergraduate statistics 2001

Degree Title	No sat	Total no failed	Can re-sit	No re-sit	Required to transfer	% Failure rate
Artificial Intelligence	4	0	0	0	0	00.0%
Mathematical Foundations	0	0	0	0	0	00.0%
B.Eng Computing Science	35	0	0	0	0	00.0%
Computational Management	3	0	0	0	0	00.0%
European Programme	1	0	0	0	0	00.0%
Software Engineering	17	0	0	0	0	00.0%
M.Eng Computing Science	43	0	0	0	0	00.0%
Total	103	0	0	0	0	00.0%

Fourth Year undergraduate statistics 2001

Degree Title	No sat	Total no failed	Can re-sit	No re-sit	Required to transfer	% Failure rate
Artificial Intelligence	0	0	0	0	0	00.0%
Mathematical Foundations	0	0	0	0	0	00.0%
B.Eng Computing Science	0	0	0	0	0	00.0%
Computational Management	10	0	0	0	0	00.0%
European Programme	0	0	0	0	0	00.0%
Software Engineering	20	0	0	0	0	00.0%
M.Eng Computing Science	39	0	0	0	0	00.0%
Total	69	0	0	0	0	00.0%

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1.19 Student Opinion

1.19 Student Opinion

Alison Clovis
Software Engineering (Artificial Intelligence and Knowledge Engineering (MEng)

Third Year
I came to Imperial because it had the best reputation for software engineering and I also wanted to be in London. There are many students of diverse nationalities and cultures and this makes the atmosphere interesting.
The Department is well structured and the staff, who are at the forefront of their field, share their knowledge with students. It has very modern facilities and we have the opportunity to use machines not available in other universities.

The course covers a wide range of subjects and is very broad based and we learn highly advanced computing techniques.
I took a year out before starting my course and worked for HM Customs and Excise in Liverpool. I am also sponsored by the Ministry of Defence and work for them in the summer vacation.

I have lived in Earl's Court for the past year and half and enjoy being only 20 minutes' walk from College, in an area with good amenities. I have also lived in Weeks Hall, which was great, and I met a lot of my closest friends there. I regretted having to leave; after all it was only two minutes' walk from College!
I love living in London but it can be very expensive. I enjoy going to the cinema and restaurants. I go to the Sports Centre and am a member of the Afro-Caribbean Society, which provides concessions for cinemas, pubs and theatres.

I hope to go on to do my PhD overseas when I graduate

Darius Fidgett
Computing Science (M.Eng)

Fourth Year
I chose to study at Imperial because of the course, the departmental facilities and the location. Imperial is a serious academic institution. Everybody works hard and many departments are quite competitive.

Coming from a mathematical background, I particularly like having the choice of studying a very theoretical selection of courses. This gives you the opportunity to look behind the scenes and not just concentrate on programming. The choice of options is wide and if you prefer other areas of computing you'll also be well catered for. The course culminates in an individual project, which allows students to research the cutting edge of computer science. The department is well staffed and the computing facilities are fantastic.

Before coming here I took a year out and travelled to Russia by train and around Canada. After my first year here, I worked in Italy for three months as a programmer. I've also worked for two weeks at the European Parliament in Brussels and did my industrial placement in Germany.

I enjoy taking part in quizzes and was captain of the University Challenge team for 2001 – 2002. I also like to sing and act and have been a member of the musical theatre and dramatic societies.

When I graduate, I intend to work for a couple of years in the computing industry and then I hope to work for the European Commission.

Jamie Denton (Yr 2 M.Eng Student) – 2002 Student Representative

To summarise student opinion, the general consensus is that course teaching is of a good overall standard. One of the most common complaints levelled by students at teaching is that the lectures move too fast, assuming too much knowledge and leaving people behind, but for the same lecturers many complain that they move too slow, or assume too little knowledge. This is obviously a difficult balance to strike, and the fact that people complain of both problems about the lectures suggest that the pace of teaching is about right in most lectures.
Most lecturers do provide written notes, often printed versions of slides, which are felt to be a help to students as, although some may not be of a high standard, greatly increase the opportunity to listen rather than scribble constantly (although it could be argued that this results in more opportunity to sleep!).
The only area of teaching that could reasonably be called into question is a reliance on the Mathematics department for supply teaching for many mathematical courses, which occasionally seem to receive substandard teaching from lecturers whose style and reliance on whiteboards, which are hard to see from the back half of a lecture theatre, leave students unable to comprehend the lectures. There have been instances where Mathematics department supply lecturers have left out entire sections of subject matter, which are often required for other courses. To its credit, when problems come to light, the department does take swift and appropriate action to correct this. That said, the standard of much of the maths teaching is very good, with the majority of maths courses being well run.
As for facilities, the revamped lecture theatres provide an ideal atmosphere for lectures, being both more comfortable and pleasant for students, and also making far more reliable and modern visual aids available to lecturers. It would seem almost incomprehensible then, that a small group of lecturers insist on using the whiteboards, which are harder for students to see and reduce the accessibility of the lecture when more suitable visual aids are easily available. There is one criticism levelled at the new lecture facilities as they are wholly unsuitable for the tutorials, which are scheduled in them, with lecturers and helpers being unable to get to students who are not at the edges of the seating area. The computer facilities, especially with recent upgrades and additions, are more than adequate for their purpose and in good working order. The labs themselves could use smartening to improve the working environment; however that is a cosmetic issue.