



THE UNIVERSITY *of* EDINBURGH  
**informatics**

Undergraduate Prospectus



**UNDER  
GRAD**

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Cover Image:

*In July 2008, our new building, the Informatics Forum, opened next door to our teaching space.*



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*For research, Edinburgh Informatics is the largest and highest rated computing department in the UK. The latest Teaching Quality Assessment Exercise also ranked us as 'excellent' for our teaching.*

# What is Informatics?

Informatics is the study of how natural and artificial systems store, process and communicate information.

Combining insights from Computer Science, Artificial Intelligence and Cognitive Science, Informatics studies information, computation and communication in both computer systems and natural systems such as the brain, our genes and human language. An Edinburgh degree offers you a sound foundation in the traditional subjects together with a new perspective of how to bring 'computational thinking' to a host of novel settings.

In the School of Informatics we start with a view that our subject is central to a new enlightenment in scholarship and learning. For us, informatics is critical to the development of science, technology and society. In the information age, computing technology changes how we work and play. Informatics changes the way we think.

## Our school

The School of Informatics at the University of Edinburgh is one of the best in the world.

We have a substantial national and international reputation in both teaching and research.

For teaching, Edinburgh Informatics has been ranked as 'excellent' in a recent Quality Assessment Exercise and for research the school is the largest and highest rated computing department in the UK. Our school is also highly regarded by students themselves given that we won the best overall department in 2009/10 as voted for by students at Edinburgh University.

The size of our school means that we are big enough to provide outstanding facilities for students. Our city centre premises including a newly refurbished teaching centre and a research centre, the Informatics Forum.

## Our degrees

We teach the fundamental science of computation, the practical skills needed to build hardware and software, and the cutting edge of research and applications in Informatics.

You will receive a strong grounding in the basics: computation and logic, programming, algorithms, data manipulation, systems and mathematics for informatics. You can also choose from a wide range of specialisations, from computer reasoning to robotics, from the theory of computability to computer graphics. See pages 16-21 for more detail of our course content and options.

Informatics is interdisciplinary by nature and you also have the choice to combine mathematics, physics, electronics, philosophy, linguistics, psychology or management studies with your degree in computer science, cognitive science, software engineering or artificial intelligence. See pages 8-10 for more detail on the available single and joint degrees.

Our course materials and student projects are based on our world class research. So you will graduate with knowledge and skills in the forefront of the field.



**DEFINING  
THE FUTURE  
OF INFORMATICS**

# Studying in Edinburgh

Edinburgh is a thriving, exciting city. It is regularly voted as one of the most desirable places to live. As Scotland's capital, Edinburgh is steeped in history and tradition. Edinburgh has many landmarks such as the Castle, the Forth Rail Bridge and Arthur's Seat.

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Edinburgh is also renowned for its stunning Georgian architecture, winding cobbled streets and numerous open, green spaces, which all contribute to its picture-perfect beauty.

## Entertainment

Edinburgh's nightlife has something for everyone. Traditional pubs or fashionable bars cater for a quiet drink or a full-on party.

If you enjoy music, Edinburgh's many venues attract live acts all year round – from stadium bands to obscure singer-songwriters.

For eating out, choose from a wide range of restaurants, serving an abundance of international cuisines and catering for all budgets. Haggis is not obligatory, but you just might acquire a taste for it!

Edinburgh also knows how to rise to a big occasion. Its famous annual Hogmanay party attracts visitors from all over the world every New Year's Eve. Festival season in August sees the Edinburgh International Festival, Festival Fringe, and International Book Festival among others. These events take over the city, attracting visitors from all over the globe. The Fringe attracts a host of comedic talent ranging from well-known stars like John Bishop and Jason Byrne to up-and-coming comic talent.

## Sport and culture

Edinburgh has many museums, galleries, libraries and theatres. Its galleries attract big-name exhibitions. Its museums can also provide insight into Scottish culture, past and present, as well as societies from far-flung places and distant times.

Edinburgh has hosted the 1986 Commonwealth Games and is due to host the 2014 Games diving events at the newly refurbished Royal Commonwealth Pool. As well as top-class swimming pools, the city also boasts a variety of other high quality sporting facilities. Fancy Europe's longest dry ski slope? We've got it. Then there is the international rugby stadium at Murrayfield, an ice rink, and climbing wall at nearby Ratho. We also do soccer. For those who love the outdoors, the rest of Scotland's spectacular scenery is not far to reach by road or rail.

*Explore the city of Edinburgh: webcams, photographic tours, guides at [www.ed.ac.uk/about/city](http://www.ed.ac.uk/about/city)*



# The University of Edinburgh

Consistently ranked among the best universities in the world, the University of Edinburgh is a leading international centre of academic excellence. It is one of the largest and most successful research universities in the UK.

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A world-class institution for teaching and research. A member of the Russell Group of universities – often referred to as the UK’s equivalent to the American Ivy League – Edinburgh’s eminent staff and graduates have been responsible for worldwide achievements. Astronaut Piers Sellers, Olympians Chris Hoy and Katherine Grainger, former Prime Minister Gordon Brown and former MI5 director Stella Rimington all studied at Edinburgh.

Academic staff members of Edinburgh include Professor Peter Higgs, whose Higgs-Boson particle discovery may solve some of the biggest puzzles of particle physics. Another eminent scientist, Professor Ian Wilmut, famously led the team who cloned Dolly the Sheep. Professor Tom Devine is a leading voice on Scottish history. Bill Laing took his Edinburgh degree and went on to become a corporate vice president with Microsoft.

## The student experience

With more than 29,000 students from 120 countries, the university has a vibrant, cosmopolitan campus community. Edinburgh offers more than 600 degree programmes, including at least 200 joint degree combinations.

Our degree courses are flexible. Students can develop a range of academic interests. The structure of our programmes enables, indeed positively encourages, students to study a broad range of subjects in the first two years. We follow this with a more specialised approach in the final two years.

## Student services and facilities

The university offers a wide range of student services and support to cater for all your academic, practical or personal needs while you study here.

## IT facilities

You will have access to large, well-equipped, 24-hour computer labs within the School of Informatics. In addition, all students can use the computing facilities of the university’s central services, such as the Main Library. We also run ResNet, a residential networking system that provides telephone and internet services to most students in university accommodation.

## Library

The Main Library at George Square is one of 14 libraries within the University and is also one of the largest copyright libraries in the UK.

## Accommodation

You can choose between self-catered or catered residences, self-contained flats or halls. The main residential area, at Pollock Halls, is at the foot of the Arthur’s Seat, offering some tenants stunning views.

## Making friends

Many of our students are not just new to Edinburgh but new to the UK. Edinburgh University Student Association offers a vast array of services and more than 150 clubs and societies cater for all interests and tastes. Our affordable Centre for Sports and Exercise offers top-rate facilities.



# Degrees in the School of Informatics

Our broad approach to informatics, our world-class research and the fact that Edinburgh Informatics is the UK's largest IT department, means that we offer students a broad range of flexible degree courses.

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Join us in Edinburgh Informatics and you can study for a degree in:

- computer science
- software engineering
- artificial intelligence
- cognitive science
- informatics

Our degree courses provide a firm grounding in the mathematics and underlying knowledge that informatics graduates will need throughout their careers enabling them to stay at the forefront of this ever changing field.

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## Computer Science (BSc and BEng)

*If you want to know everything about computers, this is the degree for you.* The four-year BSc or BEng degree in Computer Science gives students a firm basis in the understanding, design, implementation and use of computing systems – from the components of a single processor to networks as vast as the World Wide Web. Our courses cover topics that range from programming languages and software to distributed, parallel and quantum computing.

You can study for a BSc or a BEng computer science on its own or in combination with artificial intelligence, management science, physics or electronics.

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## Software Engineering (BEng)

*A degree course for professional programmers.* Edinburgh's degree in software engineering takes four years to complete. It gives students the engineering skills they need to write good software, to understand what programs have to do, and how to test, validate and implement software. Our degree in this subject also has the option to study how software engineering and electronic systems come together, or to study artificial intelligence.



**COMPUTER SCIENCE  
SOFTWARE ENGINEERING  
ARTIFICIAL INTELLIGENCE  
COGNITIVE SCIENCE  
INFORMATICS**

*Our graduates also fulfil the educational requirement to become a member of the **British Computer Society**, the UK's leading professional body for people working in IT.*

# Degrees in the School of Informatics *continued*

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## Artificial Intelligence (BSc)

*A degree in a subject that we pioneered.*

Our four-year degree in Artificial Intelligence (AI) combines the areas of science you need to understand how computers can emulate human intelligence by performing tasks that usually require the sophistication of a human brain. Edinburgh Informatics is a world leader in research in AI. In their degree projects, our students have a chance to contribute to real scientific advance in this field.

You can study for a BSc in Artificial Intelligence on its own or in combination with computer science, software engineering, mathematics or management.

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## Cognitive Science (BSc, MA)

*Our specialist degree course, designed for brain watchers.* An undergraduate degree in an exciting area of science, Cognitive Science analyses and synthesises human and animal behaviour and mental processes, at many levels. The course blends challenging theoretical ideas and hands-on practical projects. A core theme underpinning this programme is the computational modelling of mental abilities at many levels, from neurons to social groups.

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## Informatics (MInf)

*Our premier degree takes in everything that matters.* Our Masters of Informatics (MInf) degree is an integrated programme taking you to a Master's level qualification over five years of study. The first three years of the MInf are similar to our BSc and BEng degrees providing a firm foundation for advanced study in Informatics and covering a diverse range of topics including computer science, artificial intelligence, linguistics, cognitive science, neuroscience, psychology and biology. The final two years of study include a personal project; preparations in fourth year and project delivery in the fifth year. The final year offers access to a wide range of Master's level courses given by leaders in their chosen fields.

## Professional recognition

A degree from Edinburgh's School of Informatics is a great start for a career in whichever area of informatics appeals to you. But you can enhance your appeal to employers even more if you turn up with the right professional qualifications.

Our degrees can also be a stepping stone to those qualifications. For example, graduates also fulfil the educational requirement to become a member of the British Computer Society, the UK's leading professional body for people working in IT. You can also obtain the status of Chartered Engineer (CEng) in the Register of Engineers with the Engineering Council UK, if you complete work equivalent to an additional undergraduate year of study, within industry for example.



# Entry requirements

The University's entry requirements reflect its long-standing commitment to broadening access to higher education but they also ensure that we attract entrants who will be well-equipped to handle our challenging courses.

## Standard entry

**The typical offer is likely to be:**

- SQA Highers: AAAA in one sitting
- GCE A Levels: AAA in one sitting
- IB: 37 points with 655 at HL

**The minimum entry requirements are:**

- SQA Highers: ABBB, or more if two sittings, to include Mathematics at Grade A. We strongly recommend that you study Advanced Higher Mathematics.
- GCE A Levels: ABB in one sitting, to include Mathematics at Grade A.
- IB: 32 points overall and award of IB Diploma to include Mathematics HL at Grade 6 and two further HL subjects at Grade 5.

A pass is required in English, at least at SQA Standard Grade 3 or GCSE Grade C- or the equivalent.

The school also offers direct entry into second year provided specific entry requirements are met.

## Overseas applicants

A large number of European and international qualifications are also accepted. These include the International Baccalaureate, European Baccalaureate or the Irish Leaving Certificate, as well as many national qualifications.

*More information for overseas applicants can be found at:*

[www.ed.ac.uk/schools-departments/science-engineering/studying/undergraduate](http://www.ed.ac.uk/schools-departments/science-engineering/studying/undergraduate)

## Mature applicants

For applicants aged 21 or over by 1 September in the year of entry, entrance may be gained in a variety of ways including recent SQA Highers or A-levels, an Open Studies Credit for Entry Certificate which is awarded by the University of Edinburgh's Office of Lifelong Learning, Open University credits or satisfactory completion of a validated access course.

The school also offers direct entry into second year provided specific entry requirements are met.

*For the most up to date entry requirements and more information please see:*

[www.ed.ac.uk/schools-departments/informatics/undergraduate/entry](http://www.ed.ac.uk/schools-departments/informatics/undergraduate/entry)

# If you receive an offer

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Given the reputation of the School of Informatics, entry to courses is competitive. However if you receive an unconditional offer you will be notified by the school well in advance of the commencing term.

Should this happen you may be invited to attend one of our post application visit days which are held in the early part of each calendar year. Here you will have the opportunity to speak to Informatics staff and students in more depth about your courses and your time as a student at the University of Edinburgh.

*You will also find more information and visual resources on social groups, courses and life at the University at our School of Informatics Welcome pages at:*

***[www.ed.ac.uk/schools-departments/informatics/student-services/welcomepage](http://www.ed.ac.uk/schools-departments/informatics/student-services/welcomepage)***

*If you have received an offer to study at the School of Informatics and would like further information you can also contact us at ***[ito@inf.ed.ac.uk](mailto:ito@inf.ed.ac.uk)****

# What you will study

In line with the Scottish University system, honours degrees in Edinburgh Informatics last four years and masters degrees five years. Outstanding candidates may be considered for direct entry into the second year. Please contact us if you want to pursue this possibility.

Each year of undergraduate study involves taking a series of courses. Each course offers a unit of formal learning and teaching, and earns students a number of credit points, depending upon its level. A typical workload for each year of full-time study is a set of courses worth a total of 120 credits.

The table opposite outlines the typical structure of one of our degrees. Our website, [www.inf.ed.ac.uk](http://www.inf.ed.ac.uk), has more detailed information for a specific programme of study.

See also the *Overview of Course Content* sections on pages 16-21.

Degree course	Credits
<b>1st Year</b>	
Informatics 1	40
Introduction to Linear Algebra	20
Calculus and its Applications	20
Other courses*	40
<b>2nd Year</b>	
Informatics 2A	20
Informatics 2B	20
Informatics 2C or 2D	20
Probability with Applications	20
Discrete Mathematics and Mathematical Reasoning	20
Other courses*	20
<b>3rd Year</b>	
System Design Project	20
Practical or project in CS, AI or SE	10
Professional Issues	10
Further courses in CS, AI or SE	70
Other courses*	10
<b>4th Year</b>	
Honours Project	40
Further courses in CS, AI or SE	70
Other courses*	10
<b>5th Year</b>	
<i>For the degrees of MInf and MEng only</i>	
Masters Project	60
Master's level courses in Informatics	60

\*Other courses can be chosen from any offered across the University, formally known as 'outside courses'.

## Mathematics for Informatics Students

Most Informatics students will study mathematics during the first two years. Informatics students take selected mathematics courses and will study alongside Mathematics students. We believe this is the best way to expose our students to skills in proof and problem solving that are key both to Mathematics and Informatics. Your mathematics courses reinforce and extend topics you have previously studied, and will introduce you to new topics that are particularly relevant to information processing.

Students on our Cognitive Science programme take 20 points of Mathematics courses in each of the first and second year in order to accommodate the breadth of courses required for the programme.

Students on combined-honours degrees with Physics or Electronics take similar courses to single-honours students in Physics or Electronics.

In both first and second year courses consist of four lectures and one tutorial per week.

## Mathematics Courses in Year one

*Course content*

**Calculus and its applications:** This course includes functions (types/composition), limits (including precise definition) and continuity. Differentiation (chain rule/implicit/differentials) and applications (max/min/mean value theorem/Newton's method). Integration (fundamental theorem of calculus/substitution rule) and applications (Areas/volumes). Inverse functions, definition of logarithm/exponential, and L'Hopital's rule. Further integration (by parts/rational functions/approximate), and further applications (arc length/surface of revolution).

Differential equations (modelling/direction fields/separable/linear first order). Curves, polar coordinates, Taylor series.

**Introduction to Linear Algebra:** Complex Numbers. Vectors and geometry. Systems of linear equations, echelon form, Gaussian elimination, intro to span and linear independence. Matrices, multiplication, transpose, inverses, linear maps. Intro to subspaces and bases. Rank. Eigenvalues and eigenvectors. Determinants. Orthogonality, Gram-Schmidt, orthogonal diagonalisation. Introduction to abstract vector spaces and subspaces. Selected applications (taught in sequence where appropriate).

## Mathematics courses in Year two

*Course content (provisional)*

**Probability with Applications:** Sample spaces, events, probabilities, counting/combinatorics, inclusion-exclusion principle; Conditioning and independence; Discrete random variables; Continuous random variables; Jointly distributed random variables; Covariance; Inequalities; Discrete Markov chains and Birth and death processes;

**Discrete Mathematics and Mathematical Reasoning:** Fundamental concepts of mathematics; The structure of a well-reasoned mathematical proof; Discrete structures; Basic number systems and algebra; Limits and Asymptotics; Recurrence relations; Counting (more advanced counting); Rudimentary discrete probability theory.

# Course content

## Year one

### Informatics 1 at a glance

*You will study this course for all Informatics degrees.*

Credit required: 40

Course Content Informatics 1:

- Computation and Logic
- Functional Programming
- Object-oriented Programming
- Data and Analysis

Degrees:

*Required for all Informatics degrees.*

Teaching Method/Style:

- 3 lectures per week
- 1 tutorial per week in a small group
- 1 laboratory session per week

*For more information on this course go to:  
[www.inf.ed.ac.uk/teaching/courses/infl](http://www.inf.ed.ac.uk/teaching/courses/infl)*

### Informatics 1

#### ***Computation and Logic Functional Programming Object-oriented Programming Data and Analysis***

In the first semester, you will study the fundamental notions of computation, using finite state systems and propositional logic. These computational ideas are applied across the whole of Informatics, for example in design, testing and verification of programs, problem solving, processing language, pattern matching in web search, and in controllers for robots.

You will be introduced to the general principles of computer programming using the compact and powerful functional programming language, Haskell. The teaching and practical work is designed to suit students who are new to programming and students with previous experience.

In the second semester, you will study the collection, representation, storage, manipulation and querying of data and information. You will investigate diverse forms of information, ranging from structured relational databases to natural language. You will also further develop your programming skills using the popular object-oriented programming language, Java.

## **Informatics 1** *Cognitive Science*

This course provides Cognitive Science students with mathematical tools for modelling cognitive processes. Participants will study basic linear algebra and an introduction to probability and information theory. All mathematical and computational content is supported by putting it in the context of a cognitive science application. Computational tools, such as Matlab, will play an important role in the presentation of the course.

This course is compulsory for students taking BSc Cognitive Science. It is also available as an optional course for students on other Informatics degree programmes.

## **Study support**

When you enrol you will be allocated a Personal Tutor, a member of academic staff who will advise you on the choice of courses and will help you to find your way through the university's regulations and practices for the duration of your degree.

The lectures are interactive. When key concepts are introduced, students may be asked to answer questions via a hand-held clicker. If most students give the wrong answer, the lecturer will revisit the topic. Some lectures are recorded and made available online for future reference.

Tutorials are weekly practice sessions in small groups of 8 to 10 students.

In addition to this, tutors are available for consultation at scheduled drop-in labs. INFBase provides additional opportunity for students to seek help either in person at a staffed help session or via the wiki service.

These services are available throughout your period of study with us, not just in the first year.

A dedicated administrative team, the Informatics Teaching Organisation provides course materials and information about where to go when you need support and advice.

# Course content

## Year two

### Informatics 2 at a glance

*You will study this course for all Informatics degrees*

Credit required: 60

Course Content Informatics 2:

- Informatics 2A: Processing Formal & Natural Languages
- Informatics 2B: Algorithms, Data Structures, Learning
- Informatics 2C: Introduction to Computer Systems
- Informatics 2C: Introduction to Software Engineering
- Informatics 2D: Reasoning & Agents

Degrees:

*Required for all Informatics degrees.*

Teaching Method/Style:

- 3 lectures per week for each course
- 1 tutorial per week in a small group
- Practical laboratory sessions

*For more information on this course go to [www.inf.ed.ac.uk/teaching/years/ug2](http://www.inf.ed.ac.uk/teaching/years/ug2)*

### Informatics 2

The theme of Informatics 2A is language processing. This covers issues of formal languages – such as finite automata, pattern matching, formal grammars and parsing – that are essential to understanding computer languages. It also addresses the analysis of complex phenomena, including natural languages and music.

Informatics 2B looks at algorithms and learning from data. It introduces general techniques in machine learning, search, decision trees, various forms of non-algorithmic computation, and dealing with incomplete data. It also covers the analysis of algorithms and data structures.

In Informatics 2C: Introduction to Computer Systems you will study computer architectures: atomic data and how it is represented and operated on; the structure of instruction sets; the environment in which a program executes; the concepts of a process and virtual memory; the implementation of computing devices; and processor architectures. You will also look at issues in software engineering in Informatics 2C: Introduction to Software Engineering, including requirements analysis, methodologies for development, quality management, project estimation, and verification and validation.

Informatics 2D covers reasoning and planning. It will include material on symbolic reasoning and analysis, reasoning with inference rules, solving problems using constraints, and stochastic search methods. It will also address issues in planning and agents, such as coping with a changing world and communicating with other agents. You will be introduced to current technologies such as XML and SQL for database management.

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## Iain Whiteside *BSc Computer Science & Mathematics*

Iain was crowned UK's most enterprising student 2007. Iain took part in the Shell Step summer placement scheme, which matches talented students with small and medium sized firms seeking specialist skills for a specific project.

Iain spent the summer working for Edinburgh-based Martin Energy Limited working on the company's core service, Flexitricity, which provides balancing and reserve services to the National Grid. Iain created a valuable new service, the "Demand Buyback System" and successfully installed it at its first site. The new addition is estimated to generate revenue of £4.3 million in the next 24 months.

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## Prize students

Each year we encourage students to enter for prestigious prizes such as the Young Software Engineer of the Year, organised by ScotlandIS, the trade association for software and IT in Scotland. Our students won 7 out of the last 12 prizes.

- 2011 Second prize Rami Al-ashqar, BEng Hons, Computer Science
- 2010 First prize Peter Sandilands, BSc Hons, Artificial Intelligence and Computer Science
- 2009 First prize Michal Bartosik, BEng Hons, Artificial Intelligence and Software Engineering
- 2007 First prize Hui Sun, BEng Hons, Software Engineering
- 2006 First prize Nicholas O'Shea, BSc Hons, Computer Science
- 2003 First prize Tim Angus, BSc Hons, Computer Science
- 2000 First prize Will Bryson, BSc Hons, Computer Science
- 1999 First prize Edward Knowelden, BSc Hons, Artificial Intelligence and Computer Science

# Course content

## The honours years

### Informatics – Year 3

In your third year you enter the honours stream and will focus on your chosen degree specialisation. At the University of Edinburgh you will have access to a unique range of honours courses and specialisations. With the help of your Personal Tutor, you will build an honours course portfolio to suit your interests. If you are on a combined degree, approximately half of your courses will be in informatics. You can choose the remainder from a range of options in your other subject.

The focus will also shift towards more independent work, such as designing and evaluating systems, investigating research areas, and undertaking experimental projects. You will often work in groups, developing vital skills in management, communication and team-working – all highly valued by employers. You will also have the opportunity to further your presentation skills and abilities in delivering both oral and written reports.

A major part of the third year is the systems design group project, where students work in small teams to develop a large scale system. In recent years our students have faced the task of developing football playing robots, competing against each other in a local RoboCup.

### Informatics – Year 4 (and Year 5 for MInf)

The final year of your honours degree offers a further range of specialist courses. At this stage, we expect our students to grapple in depth with the central issues in this field, to understand recent research developments and to gain experience in advanced techniques.

During this phase students also undertake an individual research project, and write a dissertation under the supervision of a member of academic staff. You can propose your own topic, or you can take up a proposal in one of our many active research areas. Your work on your project could even contribute to original and publishable result and see your name in print.

*Here are just some examples of the subjects we offer:*

- Advanced databases
- Automated reasoning
- Bioinformatics
- Cognitive modelling
- Compiling techniques
- Computational complexity
- Computer architecture
- Computer graphics
- Computer networking
- Computer security
- Computational cognitive neuroscience
- Database systems
- Data mining and exploration
- Design and analysis of parallel algorithms
- Decision making in robots and autonomous agents
- Human-computer interaction
- Intelligent autonomous robotics
- Language semantics and implementation
- Machine learning & pattern recognition
- Machine translation

- Multi-agent semantic web systems
- Neural computation
- Operating systems
- Parallel architectures
- Parallel programming languages and systems
- Performance modelling
- Probabilistic modelling and reasoning
- Querying and storing XML
- Robotics: science and systems
- Software engineering with objects and components
- Text technologies

As a student, what you do with these subjects is down to your interests and discussions with your Personal Tutor. You can get some idea of the breadth by looking at some of the informatics projects that fourth-year students have worked on:

- A motorised motion tracking system
- Agent based model of household energy use
- Application of wasp’s navigation techniques to aerial robotics
- Basketball game video analysis
- Capturing 3D objects by KINECT
- Cloud computing on heterogeneous cores
- CycloPath: A cycling geo-wiki for Edinburgh
- Dense stereo images and object recognition
- Interactive tutoring system for software testing
- Detecting errors in human translation
- Just in time auto-parallelism for LLVM
- Learning to count objects in images
- Match fixing for amateurs
- Predicting personality from Twitter
- People tracking in built environments
- Restaurant review summariser
- Robot model of fiddler crabs
- Sentence alignment for machine translation
- Skin cancer surface shape based clarification
- Topic modeling with blogs
- Two hardware designs for an autonomous blimp
- Voice-driven programming

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## Heather Kelly

*BSc Computer Science & Physics*

Heather Kelly’s final-year project gained exposure beyond the University of Edinburgh. Supervised by Dr John Lee, Heather looked at visualising the activities in the “Wandering Rocks” chapter of James Joyce’s *Ulysses*. Her work was part of the “Bloomsday Machine”, a virtual environment for visualising narratives, that Ian Gunn and Mark Wright are developing in the School of Informatics. They showed off their work in Dublin at the James Joyce centenary symposium and the magazine *Times Higher Education* wrote about it.

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## Daniel Powell

*BEng Computer Science & Electronics*

A paper based on Daniel Powell’s final year project on machine learning, supervised by Dr Björn Franke, was accepted by a major international conference. Daniel Powell and Björn Franke, Using Continuous Statistical Machine Learning to Enable High-Speed Performance Prediction in Hybrid Instruction-/Cycle-Accurate Instruction Set Simulators. To appear in: *Proceedings of the International Conference on Hardware/Software Codesign and System Synthesis (CODES-ISSS), Grenoble, 2009.*

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# Sponsorship

## Placements, prizes and scholarships

The School of Informatics prides itself on teaching graduates who will be desirable candidates for employment with the best companies. We are involved in schemes that help our students to stand out in the competitive job market.

The School has long-standing relationships with local and global companies, many of which use technology stemming from our research. These companies understand the value of our students and are keen to recruit them. As a result they offer financial incentives in the form of work placements and prizes.

## Scholarships

Our undergraduate scholarships offset some of the cost of your studies, while also providing opportunities for work experience.

Scholarships include £1,000 a year and a paid job placement during the summer between your third and fourth years of study. Sponsors may offer students further work placements or employment at the end of their degree, but they are not obliged to take them.

Scholarships are normally awarded at the end of the first year of study. Selection is based on academic results.

## Work placements

Work placements may be offered to our students from companies that the school has built a relationship with. Placements last up to a year working in industry and are typically open to students who have just completed their third year of study.

## School internships

The School sponsors some of the best students to take part in research projects. This provides an excellent opportunity to engage in cutting-edge science and to gain valuable experience of working in a research environment. These internships usually take place during the summer, between the third and fourth years.

## Prizes

Our Student Prize Scheme rewards and recognises outstanding student performance. The sponsors of these prizes include the School of Informatics along with professional organisations, such as the British Computer Society, and major companies, including Accenture, Citigroup, Freeagent, JP Morgan, Google and Microsoft.

## Spinouts

Our commercialisation team builds on our strong research base to support and inspire globally ambitious software companies in Scotland.

Examples of companies founded by informatics graduates:

- Voxar Limited, [www.voxar.com](http://www.voxar.com), the leading provider of medical imaging software. Their flagship product, Voxar 3D, has been in continual development since 1999, and it has become a market leader with over 12,000 licenses in use.
- CereProc, [www.cereproc.com](http://www.cereproc.com), creates text-to-speech solutions for any type of application. Their core product, CereVoice, is available on any platform, from mobile and embedded devices to desktops and servers. Their voices sound engaging when reading long documents and web pages, and add realistic, emotional, voices to animated characters.

# Careers

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## Careers

Computers are everywhere in modern life. Some of the most interesting – and best-paid – opportunities in the future are open to people who really know about computing, software and information systems. The advent of pervasive ‘big data’ is changing the way every company works and Informatics is at the heart of this revolution.

Upon graduation, you are a qualified professional, a computer scientist or software engineer. You will leave the School of Informatics with the practical skills required for your profession, for example, you can build a computing system. More importantly, you are not just a programmer: you understand the underlying concepts of computer science.

Our degrees will also provide you with a set of transferable skills such as time management, team work, communication, self-directed learning, networking and decision making. These are just the sorts of skills that employers look for in their recruits!

Most of our graduates make direct vocational use of their degree and work in the IT industry. We are proud to say that nearly a fifth of our graduates are passionate computer scientists who go into further training and study either with us or elsewhere.

Some of our graduates have started multi-million pound businesses with help and advice from the School’s commercialisation team and from institutions such as Scottish Enterprise.

IT entrepreneurs often start young. If you have a business idea, one of our Business Development Managers can help you to raise funds and find advice.

Our graduates are well placed to seek careers in one of the many industries that rely heavily on computer systems.

## Media and entertainment industry:

If you have seen the inside of a television, radio or music recording studio you will appreciate the extensive interdependence of media and information technology. Applications of informatics in media and entertainment include advanced CGI for films, creative web access to museum collections, tools for music composition, and new media, such as virtual reality and social media.

**Mobile systems:** From mobile phones to iPods, there has been an explosion in the amount of information we can carry with us, or access on the move. Advances in computation and information processing are at the root of this technology – from compression algorithms for pictures and sounds, to faster and more reliable communication networks.

**User-friendly technology:** New technology often brings new problems. Improving the interface, for example, by building computer systems that can understand everyday language, will make technology more accessible to all. Complex systems, such as coordinating emergency services or security monitoring, require advanced information processing that uses intelligent algorithms.

**Environment:** Understanding the effects of human actions on the environment – local and global – is an enormously complex problem. Accurate prediction requires three-dimensional time-varying simulations that need optimised code running on high-performance parallel computing systems.

# Making your application

## How to apply

The Universities and Colleges Admissions Service (UCAS) coordinates admissions to universities in the UK. You can access an online database of all courses offered in the UK, and make an application online, at: [www.ucas.ac.uk](http://www.ucas.ac.uk).

You can apply directly to your chosen programme using one of the codes below. This will not limit your final choice of specialisation: you don't have to do that until your third year. Codes for joint degrees are included in the University prospectus and on the University website.

Computer Science – G400

Software Engineering – G600

Artificial Intelligence – G700

Cognitive Science – G859

Informatics – G500

If you plan to register for any of the joint honours degrees with Computer Science or Software Engineering, subject to satisfactory performance, you may still be able to transfer to single Honours in Computer Science or Software Engineering at any time during your first two years of your study.

If you intend to register for any joint degrees with Humanities disciplines you are also eligible for transfer to single honours in Artificial Intelligence or Computer Science, subject to satisfactory performance in the first-year Informatics course. (Please note that second year entry is not available to these degrees.)

*Our UCAS institution code is E56. For more information please see [www.ed.ac.uk/studying/undergraduate](http://www.ed.ac.uk/studying/undergraduate)*

## Visit us

Choosing a university is an important part of your education. We know that people like to check out new places before they choose where to study. There are opportunities to visit the School of Informatics throughout the year, before or after you apply. The University of Edinburgh holds open days, usually in June and September.

The University's Student Recruitment and Admissions Service ([www.sra.ed.ac.uk](http://www.sra.ed.ac.uk)) also coordinates visits by groups and individuals.

*If you cannot visit, you can take an online 'virtual tour' of our teaching facilities at [www.inf.ed.ac.uk/undergraduate/visit.html](http://www.inf.ed.ac.uk/undergraduate/visit.html)*

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## Contact

We hope you will consider studying at the University of Edinburgh's School of Informatics, with our exciting degree courses, and that the information in this booklet helps you to decide. If you have any queries, don't hesitate to contact us at:

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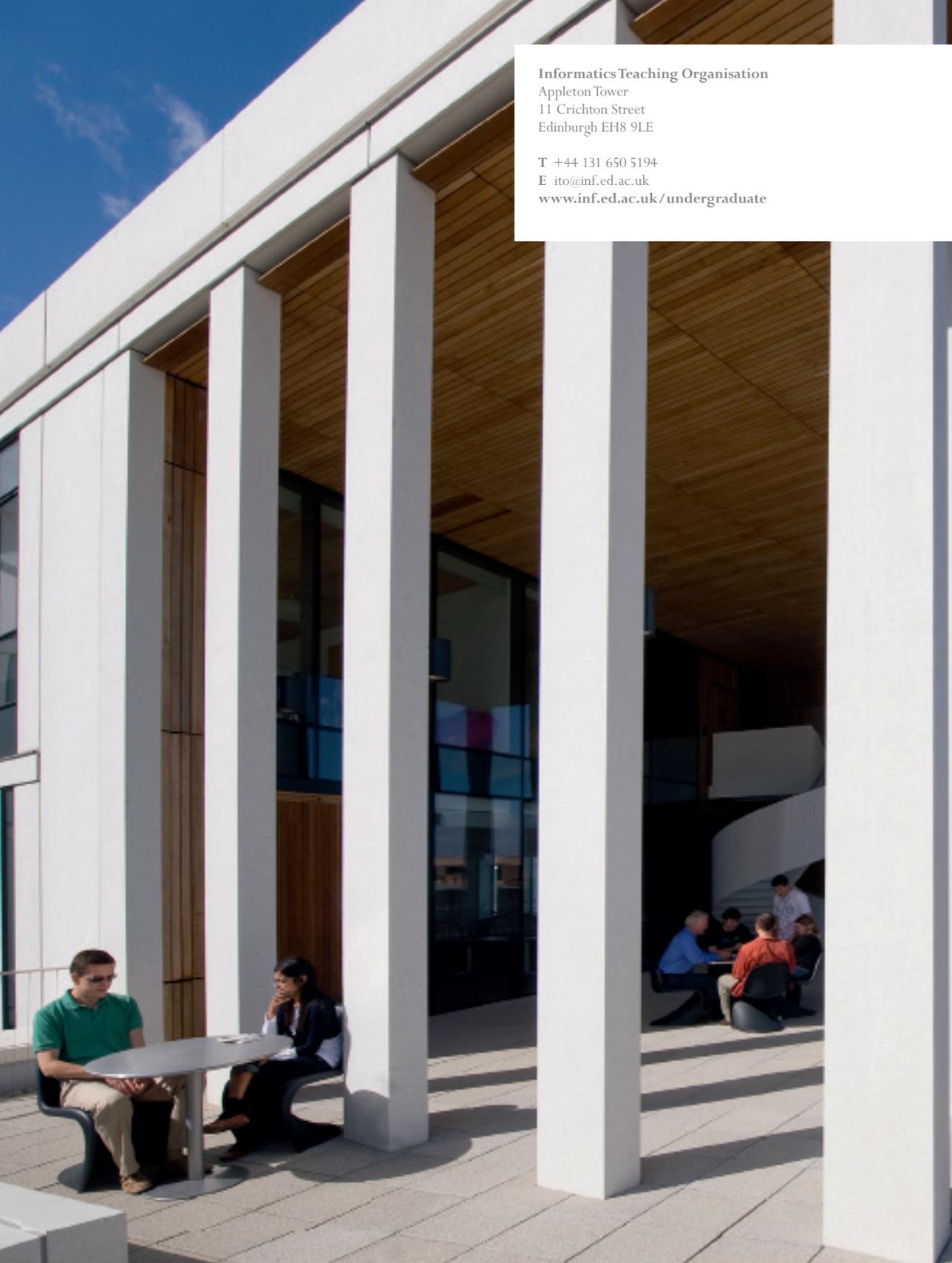
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