Computing

When can I visit?
Our Open Day dates for 2011 are 11 June and 8 October. We also run regular campus tours. Please book online at **www.sussex.ac.uk/visitors** or call 01273 876787

All applicants offered a place are invited to an admissions day during the autumn or spring terms. These give an insight into our degrees and what it's like to study here, through talks, tours, demonstrations and course sampler sessions

Robert's perspective

'The Computer Science and Artificial Intelligence programme at Sussex really brings computer science to life. I enjoyed the foundational topics, covering things like algorithms, compilers, networks, and other "traditional" topics, but the chance to bring in subjects from the Intelligent Systems theme lent another dimension to the programme.

'In one course, I looked at the way both robotic systems and creatures found in nature adapt to their environment, providing an exciting new perspective on robust computing. Another course gave me hands-on experience with building robots, where theory really meets practice! I'd never have understood just how deeply challenging AI actually is without those first-hand experiences.

'The whole programme works really well to balance solid theory with creative and interesting practical exercises. The course material alone is great, but the lecturers really make it shine. What I particularly valued at Sussex was the colourful mix of "been-there, built-that" lecturers, combined with fresh characters just starting out on fascinating research careers. I'm now starting my own career, running a business full time – Sussex has proved a really solid foundation for the task!'

Robert Redwood
Computer Science and Artificial Intelligence graduate, and Managing Director, robertredwood.com, software consultancy and website design

Essentials

What computing degrees are there?
BSc degrees
Computer Science
Computer Science and Artificial Intelligence
Computing for Business and Management
Computing for Digital Media
Games and Multimedia Environments
Music Informatics
Computing Sciences (with a Foundation Year)

BA degree
Music Informatics

What degrees can I take with computing as a minor?
Mathematics with Computer Science (p94)

See also

What A levels/IB scores do I need?

Typical A level offer: ABB

For BA Music Informatics, A levels (or equivalent) must include Music or Music Technology, grade B, or other evidence of advanced musical literacy (to grade 7 Theory standard)

Typical IB diploma offer range: 34 points

For BA Music Informatics, 34 points including at least 5 in Higher Level Music, or other evidence of advanced musical literacy (to grade 7 Theory standard)

What else do I need?
GCSE (or equivalent) in Mathematics, grade B

Fees

What scholarships are there?
Unlimited scholarships of £1,000 are available. These will be awarded on entry to students who firmly accept our offer of a place by the UCAS deadline and achieve three A grades at A level in a single sitting, excluding General Studies

English language requirements
IELTS 6.0, with 6.0 in each of the four components. Internet-based TOEFL with 80 overall, including at least 22 in Speaking and 24 in Writing. For alternative English language requirements, refer to page 130

Foundation year for UK and EU students

Foundation year for non-EU students

Why computing?
Computing is an essential part of 21st-century life, and is an exceptionally fast-moving subject that gives rise to a range of interesting and challenging problems. The implementation of today's complex computing systems, networks and multimedia systems requires the skills of knowledgeable and versatile computer scientists. Computer networks and the internet are now central to the study of computing and information technology, presenting both technical and social challenges. Artificial intelligence (AI) – the study of intelligent behaviour – is having an increasing influence on computer system design.

Why computing at Sussex?
• We are a leading centre for teaching and research in many aspects of computing, including computer science, multimedia, human-centred computing, music informatics, artificial intelligence and cognitive science. Ranked the 10th in *The Guardian University Guide 2011*.

• Computing at Sussex scored 94 per cent in the student satisfaction category of the 2010 National Student Survey (NSS), ranking 3rd in the UK.

• Cutting-edge courses informed by our internationally recognised research – computing at Sussex was rated in the top 15 of UK universities for the quality and volume of our research in the 2008 Research Assessment Exercise (RAE). 95 per cent of our research was rated as recognised internationally or higher, with 70 per cent rated as internationally excellent or higher, and one-fifth rated as world leading.

• We teach core skills such as Java programming and teamwork, SQL and relational database management, and professional issues with a focus on employability.

• Our degree programmes provide a firm foundation in the core topics and, in addition, allow you to take options that reflect your particular interests (for example, computer graphics and animation, games, robotics, or web technologies).

• Attractive, well-equipped computer laboratories with modern high-spec PCs, a state-of-the-art multimedia laboratory, and two special-purpose broadcast studios with digital video-editing facilities, PA and recording equipment for music-based courses.

Applicants to computing degrees do not require previous programming experience. We encourage applications from anyone who enjoys the challenges of problem solving and relishes the potential of new technology.

Digital video-mixing facilities in the School of Informatics' dedicated media technology lab

What sort of career could I have?

Computer science and AI are subjects highly regarded in industry, and many companies seek to recruit our graduates. The computing skills you acquire through your degree are widely sought by employers, as are transferable skills such as practical problem solving, communication skills and an understanding of scientific method. The range of careers open to computing graduates is constantly widening as the IT industry diversifies. Computing graduates have higher employment and average pay levels than graduates from most other disciplines.

IT-related:

• software/multimedia web development

• games programming

• project management

• search engine analysis

• data migration and IT consultancy.

Non-IT-related:

• treasury associate

• graphic artist

• business intelligence consultant

• management accountant

• corporate finance and investment banking.

We maintain a database of employers and cultivate personal links with relevant organisations to help you find jobs. Many of our graduates find employment in the flourishing computing, multimedia and games industry in the Brighton area, and these employers also provide opportunities for interesting and fulfilling summer jobs and part-time work.

How will I learn?

We teach by a combination of lectures, seminars, exercise classes, individual and small-group supervision and computer-based practical work. Some teaching is by means of group projects, linked to particular courses, while studio work provides a team-based environment for technical development and implementation.

We also run a peer-assisted learning scheme, which has non-compulsory additional classes to provide extra support for particular courses. These classes are run by students who have already taken the course.

Assessment is by a combination of exams, coursework (such as software exercises, reports, oral presentations and essays), group projects and a large-scale individual project. Nearly all courses are assessed at least partly by coursework, and many also have an end-of-year exam.

What will I achieve?

• You can expect to develop a firm foundation in your chosen area that will provide a solid basis for your future career development. Our degrees also provide a range of invaluable transferable skills, including those of presentation, organisation, communication, problem solving, time management and teamworking.

• You learn to apply appropriate theories and techniques to the design and development of computing systems, and to use the correct criteria and tools for the planning, development, documentation, testing and evaluation of software systems.

• You gain an understanding of the underlying hardware and software that support computer systems and the internet, and attain a fundamental knowledge of how sound, image and video applications are supported, developed and used.

• In the AI courses, you discover how AI supports the design of intelligent computer systems and gain an understanding of the study of intelligence in both humans and machines.

• You also learn to manage your own personal professional career development in preparation for further study or the world of work, and beyond.

Luke's perspective

'I'm in my third year of a Computer Science degree and my experience so far has been amazing! After looking at universities up and down the country, I met the enthusiastic tutors at Sussex, saw the great facilities on offer and knew this was the place for me.

'One of the great things about the School of Informatics is that it's a very close-knit community. It's not uncommon to walk into the labs in the evening after classes and find groups of people working together on the day's lecture material or helping each other out with problems. Added to this the lecturers are happy to stop for a chat or go through something you're stuck with, and will frequently go above and beyond to help make sure you get the most you possibly can out of your time here.

'I think this is one of the all-round best schools in the country – so much so, I'm staying on at Sussex to do a Masters degree.'

Luke Whiting
BSc in Computer Science

Chris's career perspective

'The prospect of living in Brighton first attracted me to the University of Sussex, and after deciding that I wanted to study artificial intelligence, Sussex's international recognition in the field made it a perfect match for my aspirations.

'The courses were designed to accommodate a variety of academic backgrounds, providing extra tuition for those who required it, and the lecturers were very friendly and approachable. Although I'd had no previous programming experience, I was able to develop a strong technical understanding of a multitude of programming languages and scripts. This helped me to secure a place on the American Express Technologies Graduate Programme and, after demonstrating the technical aptitude that I acquired during my BSc, I was offered a full-time position as a Senior Programmer Analyst, working within the International Interactive Development Department.'

Chris Young
Senior Programmer Analyst, American Express

Robots in the autonomous systems lab

Degrees

Computer Science
BSc (Hons), 3 years UCAS Code: G400

We are in the midst of a revolution in the world of computing that will have far-reaching implications for all of our lives. Within a few years we will be surrounded by many thousands of (mostly invisible) microprocessors pervading our homes, offices, hospitals, classrooms, cars and even outdoor environments. The emergence of this new digital era will bring with it many scientific, technological and social challenges. Our Computer Science degree has been designed to prepare you for a career at the forefront of these exciting developments.

By focusing on underlying principles, you will be able to quickly grasp both today's technologies and those of the future. You will also develop an appreciation of advanced topics in computing and you can adapt the degree to your specific interests and career objectives.

This degree includes core courses in programming, software engineering, computer systems, foundations of computation and professional issues, as well as the fundamentals of artificial intelligence and multimedia. In addition, you have the opportunity to choose from a wide range of specialist topics such as web computing, e-business, adaptive systems and technology-enhanced learning.

Computer Science and Artificial Intelligence
BSc (Hons), 3 years UCAS Code: GG47

Sussex has a worldwide reputation for research in artificial intelligence (AI). This degree explores the scientific basis of intelligence in animals and machines and provides a thorough understanding of how to design and build intelligent computer systems.

AI specialists can write programs that extract facts from newspaper articles, and enhance search engines for the 'semantic web' by taking account of the meaning in web articles. They look at ants in order to develop navigational abilities in robots, and find new ways to program computers that interpret images for airport surveillance. You will learn about the technologies required to do all these things and more.

You take core courses in artificial intelligence and cognitive science, as well as programming, computer systems, foundations of computation and professional issues. In the second year, you have the opportunity to choose between extending your degree in the direction of either computer science or cognitive science. In the first case you will take further courses in software development and computer systems; in the second you will take complementary courses in philosophy, psychology or neuroscience.

Computing for Business and Management
BSc (Hons), 3 years UCAS Code: GN42

This degree offers excellent career prospects, blending courses in computer technology and software development with marketing and management to address the needs of business computing and the fields of e-commerce and e-business. You gain skills in software design and development, computer networks and digital communications, information technology and web services, as well as in innovation and marketing, business and management, and e-business.

You will also gain practical skills using various types of hardware and software, and have access to modern computing labs to undertake a wide range of practical work assignments.

You take core courses in programming, software engineering, computer systems, web computing and professional issues. In addition, you take specialist courses covering key aspects of management and marketing, as well as web-based commerce and e-business.

Computing for Digital Media
BSc (Hons), 3 years UCAS Code: G460

With this degree you will be at the forefront of advances in multimedia, video production, audio technology, advanced computer graphics and video special effects. This programme covers the fundamentals of digital systems and software development, together with creation of the media content necessary for the implementation of multimedia systems.

The degree programme gives you the experience and qualifications necessary to work in many multimedia and digital systems industries, from video production and computer animation to web design and digital broadcasting. You gain skills in areas including multimedia systems basics, multimedia content creation and web design, software engineering and design, creation and manipulation of video and audio content, 3D graphics and animation, computer architecture, and computer networks. You work on both individual and group projects.

The degree is supported by the media technology lab, which provides state-of-the-art digital facilities, software development tools, multimedia content creation tools, studio facilities, professional video-editing systems and sound-recording facilities. The lab enables you to undertake various practical work assignments using up-to-date facilities that you would find in the modern digital media industry. You take cutting-edge, specialist courses in video production and 3D animation, as well as courses in computer graphics, virtual reality and multimedia design. Additionally, you complete core courses in programming, software engineering, computer systems, fundamentals of computation and professional issues.

Vicky's perspective

'I chose Sussex because of its great reputation for catering for mature students – this has certainly been my experience so far. The staff in the School of Informatics are really friendly and approachable, and understand that people from different backgrounds may need different kinds of support.

'Studying for a Computer Science degree here has allowed me to gain lots of new skills, both practical and academic. The facilities are good and we've had new machines installed in all our labs this year. Small-group seminars complement the lectures, and practical labs help you put the concepts into practice. The assessments are often based around programming projects and there are plenty of opportunities for group work – a fundamental skill in the computing industry.

'I'm currently working on my individual third-year project. It's a great opportunity to focus on the topics that interest you, and a first taste of research – I'm hoping to take the skills I've gained to move on to a Masters degree.'

Vicky Stevens
BSc in Computer Science

Course themes

Our degrees offer breadth and flexibility and are designed around course themes

Course themes currently include:

Computer Graphics and Animation focuses on 2D and 3D image modelling and rendering, and bringing static images to life either programmatically or with the aid of industry-standard software tooling

Computer Systems focuses on the inner workings of the main subsystems supporting computing, operating systems and networks

Computing Foundations lays the basis for an understanding of the logical and mathematical principles underlying computing

Intelligent Systems examines the design and implementation of intelligent computer systems that can reason and learn from data

Management covers the uses of information technology in business, with more specialised topics including financial planning and marketing

Music and Audio Systems explores the application of computers in music creation and analysis, such as automatic composition and programmatic control of audio from within software applications

Professional Issues helps you develop your communication skills, deepen your understanding of your role in society as a scientist and manage your professional development

Programming equips you with the basic skills necessary to create working computer programs, starting with object-orientation and progressing to the study of other programming paradigms

Robotics and Adaptive Systems focuses on autonomous systems that modify their behaviour according to their environment, also exploring relationships with neuroscience, psychology and biology

Software Engineering covers the theory and practice of building large computer applications, from analysis of required functionalities to deployment

Video Production gives practical experience of both the technical and creative issues in producing live video

Visual Effects covers the techniques for generating synthetic productions that look real, including 2D and 3D graphics, camera tracking and compositing

Web Computing introduces the technologies underlying the internet, including web architectures, web services, and distributed computing

Music Informatics students performing live in the media technology lab studio. The session brings together live audio input, MIDI controllers, custom electronics and computer sound processing. Music Informatics promotes diverse forms of electronic music making

Games and Multimedia Environments (GAME)
BSc (Hons), 3 years UCAS Code: GG46

With this degree you will be at the forefront of advances in game production, multimedia, audio technology, artificial intelligence, advanced computer graphics and animation. This programme covers the fundamentals of game systems and software development, together with creation of the media content necessary for the implementation of games.

This degree gives you the experience and qualifications necessary to work in many multimedia and gaming industries. You are taught skills in areas including software development, 3D graphics, artificial intelligence, multimedia and video systems fundamentals, multimedia content creation and web design, computer architecture and networks. You also undertake games-based individual and group projects.

The School of Informatics supports this programme with its excellent state-of-the-art facilities, providing software development tools, 3D modelling and rendering tools, multimedia content creation tools, studio facilities, professional video-editing systems and sound-recording facilities. The media technology laboratory enables you to undertake various practical work assignments using up-to-date facilities that you would find in the modern gaming and digital media industries.

Music Informatics
BA (Hons), 3 years UCAS Code: WG34
BSc (Hons), 3 years UCAS Code: WGH4

This exciting degree combines new music with new technology. Music informatics includes music composition, performance and analysis, studio recording, electronic and computer music, interactive multimedia and artificial intelligence. Creative skills are developed that will improve your employability across both the arts and computing sectors, and go far beyond those developed by a standard music technology programme.

You can take either a BA or a BSc in Music Informatics. Many core courses in electronic music are shared by the two programmes, but each programme has particular specialisms. The BA is more suitable for musicians with score reading skills wanting to combine a contemporary music degree with informatics, and has a prerequisite of musical literacy equivalent to grade 7 music theory. The BSc is for those wanting to explore computer science with musical applications who may not necessarily have existing formal qualifications in score reading and instrumental performance. For both degrees, you need to demonstrate a strong interest and aptitude in music. BA students who have also attained a high level of performance in instrument or voice may also be eligible for one-to-one classical or jazz tuition at the Trinity College of Music in London, or alternatively with local tutors in Brighton. We also offer tuition in popular music through Northbrook College.

In both degrees, you will take core courses in music, and an introduction to composition, taught through practical workshop sessions. You will also take courses in computer music, involving both theoretical and practical work around the computer as a musical tool, and in music technology, developing traditional studio production and composition skills.

BA students select a specialism from composition, performance or analysis. Composition students submit a portfolio of work; performance students give a recital or other public presentation; and analysts submit a written dissertation. In addition to the core courses, BSc students choose from a range of advanced courses in computing, multimedia and artificial intelligence. All students undertake a dynamic large-scale third-year project in music informatics.

Brighton is the perfect base for music informatics, with its huge diversity of alternative music venues, and games and multimedia companies. This interdisciplinary degree provides the opportunity to study a highly creative subject while developing a vocational and much sought after skill set.

Computing Sciences (with a Foundation Year)
BSc (Hons), 4 years UCAS Code: G402

The Foundation Year is taught at Central Sussex College, Crawley.

This programme leads on to one of the following computing degrees offered within the School of Informatics: Computer Science; Computer Science and Artificial Intelligence; Computing for Business and Management; Computing for Digital Media; Games and Multimedia Environments; and the BSc in Music Informatics.

This route to a Sussex degree provides courses on topics such as object-oriented programming, computer systems and web design, mathematics for computing and artificial intelligence, as well as study skills. On satisfactory completion of the foundation year, you transfer to the University of Sussex onto one of the degree programmes listed above.

The programme is particularly suitable for strong mature candidates whose background would otherwise require them to take an Access course before university study, or for candidates whose A/AS level results do not meet the requirements for Year 1 entry, as an alternative to A/AS level retakes. For these recent school leavers, we would normally expect at least CC in two A levels. The nature of the programme does, however, attract applicants with a range of background whose educational qualifications do not automatically qualify them for Year 1 entry.