

University of
Hertfordshire

U**H**
Online



School of Computer Science
Online Undergraduate Degrees

Online Bachelor's degrees in
Computer Science & Information Technology

BSc, Top-up, or individual module study options



A flexible, innovative way to get your degree

With the University of Hertfordshire's innovative online distance-learning programme, you can study for a BSc(Hons) Computer Science or BSc(Hons) Information Technology at your own pace, without ever having to set foot on campus.

You will benefit from:

- the same high academic quality standards as all University of Hertfordshire degrees.
- support from the same group of well-qualified tutors as our on campus degrees.
- a degree that allows you to study anywhere at any time.
- no campus-based exams - assessment is by coursework and online tests.
- being part of a dynamic and supportive online community of like-minded students.
- no travel or student accommodation costs.
- pay-as-you-go modules.
- a choice of two start dates.
- a four-module top-up option if you have a relevant higher diploma.

Once you have successfully completed the right number of modules, you will have an internationally-recognised degree that will open up new career opportunities or the chance to take your studies further with our online Master's degrees.

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Why study with us

The University of Hertfordshire is the UK's leading business-facing university. That means we are committed to developing new and creative approaches to learning, teaching and research that meet the demands of today's students and organisations.

The School of Computer Science has run undergraduate and postgraduate courses for more than 40 years and has invested heavily in online materials to create a sector-leading distance-learning programme.

More than 1,500 people study with us at any one time, with almost a third on our innovative online degree courses.

Research excellence

Students are supported by a school of fifty teaching staff, including five full-time professors. Our links with business and industry are particularly strong and our research is of a very high standard. We have interests in areas such as adaptive systems (including robotics), network security, algorithms, biological and neural computation, teaching and learning, and software engineering. In the last Government Research Assessment Exercise (RAE), over half our output was rated as world-leading or internationally excellent.

Discover more about the University and the School of Computer Science at go.herts.ac.uk/cs

About the courses

The BSc(Hons) Computer Science focuses on technical aspects of computing technology, such as programming and software development.

The BSc(Hons) Information Technology focuses on practical applications of computing technology, such as databases and business.

Each course is divided into three levels, equivalent to the three years of a traditional full-time course (levels 4-6). You need to complete successfully four 30-credit modules (eight 15-credit modules at level 4) to progress to the next level. Some modules are shared between the two courses while others are specific to one or the other.

Top-up

If you already have a higher diploma in Computing, Information Technology or something similar, you can progress straight to the last level (equivalent to the Final Year of a normal degree).

Continuing professional development

Like the look of some modules but don't want to study the whole course? No problem, choose the modules you want and these can form part of your CPD. Then, if you change your mind later, the credits you earn will count towards your degree.

Individual modules are subject to availability.

Entry requirements

Three-level courses:

- If you are from the UK, you need 240 UCAS points from A levels or equivalent in any subject, plus GCSE maths and English at grades A-C.
- If you are outside the UK, you need equivalent qualifications. Please visit go.herts.ac.uk/csonline.

Top-up courses:

- You need 240 credits from a BTEC Higher National Diploma, UK Foundation degree, Associate degree, IMIS Higher Diploma or any equivalent two-year, post-school qualification. Visit go.herts.ac.uk/csonline for more on qualifications.
- The subject of your qualification should be computer related, for example Computer Studies, Information Systems or IT.

General requirements:

- If your first language is not English, you need a minimum IELTS score of 6.0 or TOEFL IBT 79.
- If you are returning to study after some time away, please contact us before applying.
- If you are not sure if you meet these requirements, please apply and we will carefully consider your experience and individual circumstances. There is no application fee.

How you learn

Flexible learning

One of the major benefits of the course is that you can study when and where you want, fitting learning around work and other commitments.

Start dates and deadlines

There are two start dates a year: September and January. Each module has a fixed start date and fixed assignment deadlines.

Pace of learning

You can vary the number of modules you take at any one time. At levels 4 and 5, you will typically take two 15-credit modules or one 30-credit module per semester. At level 6, you can study at a faster rate, taking two 30-credit modules at a time, essentially studying full time. In general, you should plan on sixteen to twenty hours a week per 30-credit module.

Virtual learning environment

StudyNet is the University's virtual learning environment, giving you round-the-clock access to course materials. It's also where you will stay in touch with staff and students and receive and submit assignments. To access StudyNet, you will need a suitable PC or Mac with a good internet connection.

Support

Although you will be learning away from the University, you will have the continuous support of a small group of peers who are also studying the modules. This unique approach means you can combine the freedom of distance learning, with the motivation, discipline and community spirit of conventional study. You will also be well supported by our expert lecturers, textbooks, software and other materials.

Assessment

All assessment is based on coursework and online tests: all of which conforms to rigorous academic quality procedures. There are no formal exams.

The University provides:

- all online study content
- all the books, software and support materials you need
- access to online books and journals
- project supervision
- discussion boards and access to tutors

Tutored e-learning partner colleges

The University works with a selection of carefully validated universities, colleges and training companies to give you the chance to study at a regional learning centre. We provide all the materials and carry out assessment; the centre typically provides supplementary tuition, IT facilities and career support. Visit go.herts.ac.uk/cssupportpartners for locations.

What you learn

BSc(Hons) Computer Science

Level 4 Modules (15 Credits)

Core

- Data Driven Systems
- e-Media Design
- Foundations of Computation
- Principles of Networked Systems
- Programming Principles
- Programming and Program Design 1
- System Requirements

Optional

- Business Information Systems
- Internet Technologies

Level 5 Modules (30 Credits)

Core

- Computer Science Development Exercise
- Operating Systems and Computer Networks
- Programming and Program Design 2

Optional

- Data Management and Applications
- IT for Business

Level 6 Modules (30 Credits)

Core

- Further Object-oriented Development
- Computer Science Project/e-Learning Applications Design and Development

Optional

- Business Intelligence
- Computer Network Protocols and Architectures
- Databases
- Principles and Applications of Web Services
- Quantum Computing

Bsc(Hons) Information Technology

Level 4 Modules (15 Credits)

Core

- Business Information Systems
- Data Driven Systems
- e-Media Design
- Foundations of Computation
- Internet Technologies
- Programming Principles
- System Requirements

Optional

- Principles of Networked Systems
- Programming and Program Design 1

Level 5 Modules (30 Credits)

Core

- Information Technology Development Exercise
- Data Management and Applications
- IT for Business

Optional

- Operating Systems and Computer Networks
- Programming and Program Design 2

Level 6 Modules (30 Credits)

Core

- Strategic Information Systems Planning and Management
- Information Technology Project/Rich Internet Applications Design and Development

Optional

- Business Intelligence
- Computer Network Protocols and Architectures
- Databases
- Principles and Applications of Web Services
- Quantum Computing

What you learn - Level 4 modules

Each module is worth 15 credits and you need to complete eight successfully to progress. All modules are core to both courses unless stated.

Business Information Systems

(CS option/IT core)

This module focuses on the different types of systems used in business, why and how they are used, and how they can be built. You will explore the business needs of organisations and the processes, tools and techniques that enable an Information System (IS) application to be developed to meet those needs. You will study the different process models for developing systems, graphical techniques for representing business information, and the legal issues that apply to the use of IS applications.

Data Driven Systems

Providing an introduction to Database Management Systems (DBMS), this module takes a practical approach using case studies. It builds on application experience to cover questions of when, why and how databases are both designed and used. You will begin to learn about keys, referential links, Entity-Relationship Diagrams (ERDs) and normalisation. In particular you will develop skills in the use of SQL to create tables, query and update a small database.

e-Media Design

You will learn about the different types of media, how these are stored and the operations carried out on them. You will also learn about binary numbers and characters, text, html, style sheets, XML, the representation of colour, images and sounds. Develop skills in making straightforward design decisions for representing, storing, transmitting and processing information.

Foundations of Computation

As its name suggests, this module introduces you to a number of underlying principles that act as the foundations of computation and computer-based systems. You will gain an understanding of these principles and appreciate how they can support practical applications in software engineering and in the development and use of information technology. Typically the topics covered include data modelling, sets, binary relations, formal languages, finite state machines, logic, predicates, and pre- and post-conditions.

Internet Technologies (CS option/IT core)

An introduction to the underlying infrastructure of the internet and world wide web, this module examines how the client-server model works and how it may be applied to internet applications. To gain this understanding, you will develop practical web-authoring skills using modern tools such as Microsoft ASP.NET. Topics typically covered include the basic concepts of Internet Protocol (IP), TCP (Transfer Control Protocol), Hypertext Transfer Protocol (HTTP), Internet Service Providers (ISPs), the Domain Name System (DNS), client-server model, mark-up languages, client-side programming and server-side programming.

Principles of Networked Systems (CS core/IT option)

Develop an understanding of computer networks and distributed systems, learn some of the terminology and gain an awareness of some of the issues facing network designers. You will study network applications and the demands that different kinds of application place on the underlying network. Typical topics covered are traffic characterisation, delays, errors, throughput, jitter, switching packets and circuits, encapsulating and layering, and basic network forensics.

Level 4 modules (continued)



Programming Principles

An introduction to professional computer programming. You will study some of the fundamental principles of computer programming and develop practical skills in creating computer programs in a high-level language such as Java. These skills include coding, executing, testing, debugging and documenting, as well as the principles of good program design. The emphasis will be on basic programming principles: the structure and syntax of a program, variables and data types, operations and the evaluation of expressions, control structures (sequence, selection, iteration and subroutine call) and modularisation (including procedures/functions).

Programming and Program Design 1 (CS core/IT option)

This module follows on from Programming Principles and further develops your skills in producing a computer-based solution to specified problems in a high-level language such as Java. You will gain an appreciation of some of the issues in program design and will be given the opportunity to make informed decisions in your practical work based on some of the principles of good program design. Topics typically covered include modularisation, abstraction, encapsulation, cohesion, coupling, reusability, choice of algorithms, readability and some aspects of error handling.

System Requirements

Gain an understanding of the role of requirements in system development, the principal stages of requirements engineering, and the key challenges in developing usable requirements specifications. You'll acquire practical experience in using requirements engineering techniques and so develop the skills for deploying appropriate techniques for the elicitation, modelling and validation of requirements. Topics typically covered include the role of requirements in different process models, different types of requirements and requirements capture techniques such as interviewing, benchmarking, walkthroughs and inspections.

Please note that all modules are offered at least once per year, but this is subject to demand.

What you learn - Level 5 modules

Each module is worth 30 credits and you need to complete four successfully to progress to the next level. All modules are core to both courses unless stated.

Development Exercise

This module gives you the opportunity to create a system in a professional manner, using and developing skills and knowledge over the full software development lifecycle. For BSc(Hons) Computer Science the focus is on the technical skills for systems design, whereas for BSc(Hons) Information Technology the focus is on the technical skills for systems and usability. Topics typically include team and project management, professional issues, systems requirements, software design techniques, UML, ORM, quality assurance and process models such as plan-driven and Agile. The module is centred around a case study in which you develop a software system as part of a team.

Data Management and Applications (CS option/IT core)

This module provides an in-depth study of the design and implementation of relational databases, seen from two perspectives: the architecture and functionality of the Database Management Systems (DBMS) and the representation of the data managed by the DBMS. You will study the principles and techniques needed to develop practical relational database systems, together with the database theory on which these are founded. There is a large practical element that gives you experience of using a shared multiuser system (such as Oracle). Topics typically covered are 3-Level Architecture, the Relational Model of data, SQL, normalisation, logical and physical design, tuning, security, transaction management and query optimisation.

IT for Business (CS option/IT core)

Building on the level 4 module Business Information Systems, you will study the way in which a range of 21st century organisations operate and the necessary support IS/IT provides. Through the development of a business plan and the use of case study material, you will discover the interrelationships between different business functions and the support required from appropriate IT systems. Topics typically include critical success factors, business plans, competitive advantage, the role of IT for strategic business planning, the implications for the business of introducing an IT system, and the strategic use of internet technologies.

Operating Systems and Computer Networks (CS core/IT option)

Learn some of the principles of system software such as operating systems and networking software. You will develop a practical and theoretical understanding through a hands-on system programming task. Typical topics could include development tools, system programming APIs, process management, I/O, interprocess communication, networking layers and protocols such as TCP/IP, application protocols such as HTTP and FTP, and operating systems such as UNIX.

Programming and Program Design 2 (CS core/IT option)

PPD2 builds on the programming modules in level 4. You will explore a broad range of different approaches to programming such as procedural, object-oriented, event-driven, functional and logic-based. You will study the program components found in different types of language, how these are related and how programs are constructed using them. There is a particular emphasis on professional approaches to program design, construction, documentation and verification. There is also a significant practical element using more than one language and development environment.

Please note that all modules are offered at least once per year, but this is subject to demand.

What you learn - Level 6 modules

Each module is worth 30 credits and you need to complete four successfully to graduate. Core modules for each course are indicated, the rest are optional for both.

Business Intelligence

You will study the information systems that support decision making, the role they play in supporting business processes and their impact on the organisation. You will learn how to design and implement decision support and expert systems, and how to make an appropriate choice between them.

Computer Network Protocols and Architectures

This module provides an opportunity to reappraise the fundamental principles of computer networks and to explore their internal architectures. You will study the ways in which they can be used and how network applications may be constructed.

Databases

Learn the principles and techniques needed to design moderately complex relational database systems and gain the practical experience of their development, using a Database Management Systems (DBMS) such as Oracle to create and query a database. You will develop skills to design, implement and query a typical relational OLTP (on-line transaction processing database), using appropriate techniques and notations.

Further Object-oriented Development (CS core)

Develop your understanding of object-oriented technology in the analysis, design and implementation of software systems. This module explores how concepts such as abstraction, encapsulation and inheritance can improve software quality and how standard architectures support the reuse of software components. You will gain practical experience of a range of techniques and use a variety of industry-standard tools.

Principles and Applications of Web Services

This module introduces the fundamental architectures of web services and the protocols and standards that underpin them. You will study the strengths and weaknesses of alternative technologies and use a range of software tools to construct web-based applications and services.

Quantum Computing

Quantum Information Processing is an extremely active research area exploiting fundamental quantum phenomena in new applications from computation, secure data communication and information processing. The module is theoretical, exploring concepts and applications with an emphasis on quantum computing (QC).

Strategic Information Systems Planning and Management (IT core)

Appreciate the need for a corporate information strategy and the contribution effective management of information, systems and technology makes to competitive success. You will learn to evaluate current methods and techniques used to develop business and information strategies and to align the two.

Computer Science Project/Information Technology Project

The project gives you the opportunity to extend and deepen your knowledge of Computer Science or Information Technology. Typically, you will design and develop a substantial piece of practical work and also write an academic report describing it. You will plan, manage and evaluate the project yourself under the guidance of an individual project tutor.

Rich Internet Applications Design & Development (IT route)

E-learning Applications Design & Development (CS route)

These are very practical modules, where you will design and develop a substantial software application under the guidance of the teaching team. As part of these modules, you will be exposed to a wide range of technologies including Asynchronous Javascript And XML (AJAX). You can study Rich Internet Applications Design & Development as a replacement for the IT project, and E-learning Applications Design & Development as a replacement for the CS project.

Please note that all modules are offered at least once per year, but this is subject to demand.

Career prospects



Several thousand University of Hertfordshire Computer Science graduates can be found in a wide range of careers, with many in senior positions in the UK and throughout the world.

Typical job roles include: programmer, software developer, business analyst, software engineer, webmaster, database administrator, network designer and technical consultant.

The breadth of learning on these courses ensures you are prepared for a wide variety of careers in many areas of computing or software development.



In many ways, I have learnt more on the online course than the full-time course I took many years ago. That's because this one encourages greater self discipline and motivation, plus it's very relevant to my career. I believe the University of Hertfordshire is at the forefront of online learning and they should not underestimate the role this is playing in the future of education.

Paul Watkinson
BSc(Hons) Computer Science

The next step

Please visit go.herts.ac.uk/online to find out more about:

- our free trial of sample material
- course structure
- individual modules
- fees
- start dates and application deadlines
- tutored e-learning support partners

If you have any questions, please email us at csonline@herts.ac.uk

How to apply

Visit go.herts.ac.uk/online for an application form and steps on how to apply.

You need two academic references or one academic and one current work reference. You will also need to provide copies of your qualifications.

For tutored e-learning, please apply via that particular support partner. Details of support partners are on go.herts.ac.uk/cssupportpartners.

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