

Hertfordshire Higher Education Consortium

Science | Engineering

- Extended Degrees



Extended Degrees

What is an Extended Degree?

If you want to study for a degree, but do not have the right A Level subjects, or your grades are not as good as you hoped, an Extended Degree could be right for you. Extended Degrees involve an extra full-time year of study at your local college in addition to the normal length of an honours degree.

When you successfully complete this initial year, you will transfer to study the subsequent years of your chosen degree on the main campuses of the University of Hertfordshire. However, progression to a particular programme of study is guaranteed only for students who achieve the required level of performance during their extended year.

The programme is suitable if you:

- are unable to meet the entry requirements for your intended degree without further study.
- have been away from study for some time and want to build your confidence or wish to re-develop those skills necessary for study in higher education.

If you are a recent school leaver, the programme will help you to concentrate on areas of knowledge or skills which need further development. Your Extended Degree enables you to begin your degree studies at university on an equal footing with all other first year students. Many of our Extended Degree students go on to graduate with very good Honours degrees leading to successful careers or postgraduate study.

Where can I study for an Extended Degree?

The Hertfordshire Higher Education Consortium is a partnership of colleges across Hertfordshire working with the University of Hertfordshire to bring you excellent teaching, outstanding facilities and great support right on your doorstep. The Consortium offers you a great way to study for a university qualification closer to home. Whatever you want to achieve and wherever you're starting from, we're here to help, with an exciting range of options designed to boost your career prospects.

The Consortium Colleges where you can choose to study are:

- Hertford Regional College
- North Hertfordshire College
- Oaklands College

The initial preparatory year is spent at one of the partner Colleges. During this year you gain skills such as communication and IT, literacy and numeracy and study modules in a wide range of subjects relevant to your planned degree studies.

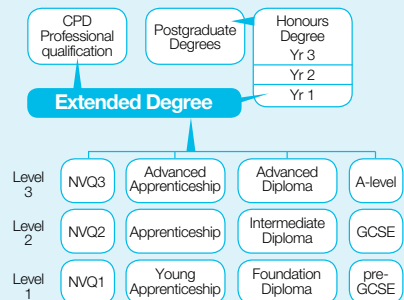
How do I benefit by choosing to study for an Extended Degree?

If your A level results were not what you hoped for or if you are returning to study after working for a while, this is the perfect opportunity for you to enhance your knowledge and gain the confidence you need in order to gain higher education qualifications.

Additional benefits for you are the following:

- the convenience of studying at local colleges which could be near your home or workplace
- small group sizes and the high level of tutor support
- all programmes are validated by the University of Hertfordshire
- they provide an affordable option – for information about fees and scholarships visit go.herts.ac.uk/fees

How do Extended Degrees fit with other qualifications?



Your Extended Degree enables you to begin your studies at university on an equal footing with all other first year students.



Extended degree in Science

The programme is offered in North Hertfordshire College only and is split into two semesters (A and B). In semester A, you study four modules. In semester B you study one core module and choose three optional modules depending on the honours degree you wish to progress to when you complete your Extended degree. The Mathematics module is offered in both Semester A and B.

The following prerequisites and corequisites apply:

- Students wishing to take the Advanced Mathematics module in Semester B need to take Mathematics in Semester A.
- Students taking Mathematics in Semester B will have taken Mathematics for Scientists in Semester A
- Students taking Physics in Semester are advised to take Mathematics in Semester A and Advanced mathematics in Semester B.

Semester A

Introductory Biology

This module has been designed to provide you with a broad background in biology. It covers Cell theory, describing how cells do the things they do and we will look at the major organelles such as the mitochondria and demonstrate how structure relates to function. You also study Biochemistry, giving a closer look at the molecules of which we are made; control of the organic systems composed of chemicals reacting together; the major groups of chemicals usually including carbohydrates, lipids, proteins and DNA. You learn about Body systems, demonstrating how the human body is the sum of its parts; this section will typically include the circulatory and respiratory systems.

Entry requirements

The normal entry requirements for the programme are: 120 points made up of at least one A level (A2), a BTEC National Award or equivalent. Plus GCSEs at Grade C or above in mathematics, English language and science or equivalent. Applicants returning to study with equivalent qualifications or relevant work experience will be welcome to apply.

If English is not your first language, you will need an IELTS score of 6.0 or 80 IBT or equivalent.

How to apply

Applications are to be made through UCAS – www.UCAS.com. Institutional Code: Herts H36.

How will I be assessed?

Assessment of the programme will be a combination of both coursework and examination. However, the main form of assessment will be coursework in the form of written assignments. Coursework may be based on both individual work and group work.

What will I learn?

This programme is designed to give you an alternative route to higher education and prepare you for progression to a science related Honours degree. There is a variety of courses that you can choose to progress to when you complete your Extended degree including Astronomy, Astrophysics, Biology, Dietetics, Environmental Management, Mathematics, Pharmacy and Pharmaceutical Science, Physics and Sport.

Please note that progression onto some degrees may require you to achieve particular tariffs and pass an interview.

Introductory Chemistry

This module will provide you with an introduction to chemistry. Topics covered include atomic structure and the periodic table, chemical bonding and its relationship to physical properties, and an introduction to organic chemistry. Completion of the module will develop essential knowledge and understanding of different areas of chemistry and how they relate to each other. The development of practical skills such as titration and carrying out experiments safely will be important. You will cover the foundation knowledge in chemistry which will allow you to continue to study chemistry at a higher level.

Introductory Physics

With this module you will gain an understanding of physics to support other sciences and prepare for the Physics module in Semester B through a combination of lectures, practical workshops and directed study. It covers topics such as reflection and refraction of light; diffraction and interference of waves; the properties of the waves across the electromagnetic spectrum; the relationship between heat and temperature; electrical power and energy; speed, distance, acceleration and force. You will develop presentation skills by presenting, to your group, information about the topic that you research during this module.

Mathematics for Scientists

This module gives you the opportunity to develop mathematical skills that are needed for the continued study of science. It focuses on the use of number skills, algebra and basic trigonometry. Graph work includes the drawing of graphs, the recognition of different forms of graphs and the role which graphs have frequently played in scientific research. You will use data to portray summary statistics and graphs, usually involving both manual work and the use of appropriate IT. You will draw inferences about data from graphs or summary statistics.

Mathematics (also offered in Semester B)

This module focuses on the differential calculus, typically enabling you to differentiate polynomials

and a selection of other simple functions. You will explore the initial steps in the integral calculus, enabling you to reverse the differentiation of the most basic functions. You will also study the exploration of logarithmic and exponential functions with some experience of their applications. Other topics include algebra, an initial exploration of vectors and two dimensional geometry using the techniques of trigonometry and Cartesian coordinate geometry.

Semester B Individual Project

This module will give you the opportunity to plan and carry out a practical scientific investigation designed to develop your personal interests in the fields of biology, chemistry or physics. The project is performed in our laboratories on an individual basis and you will plan, research, evaluate and present a project report and poster presentation. Guidance and support is provided throughout.

Advanced Mathematics

The module develops skills in integral calculus, enabling you to integrate using inspection, substitution and by parts. You will use partial fractions and trigonometric identities to simplify functions prior to integration. You will also develop skills in solving trigonometric equations typically by considering the key properties of the functions. You will use simple graph transformations to determine the number of solutions to a trigonometric equation, write simple proofs using established identities and solve a variety of trigonometric equations.





Mammalian Physiology

This module offers a good base in human/mammalian biology. You will begin to understand how our bodies communicate needs and desires necessary for survival in a hostile world. It covers topics such as the control of reproduction, integration of nervous and hormonal control of bodily functions, the role of various body systems and what happens under disease conditions. It is an ideal module for those wishing to pursue further study in Biomedical Science, Sports Science or Pharmacology.

Chemistry

This module provides you with an opportunity for further study in chemistry building on the concepts studied in Introductory Chemistry. It is particularly suitable for students wishing to study a course in biological sciences. You will examine topics such as rates of reaction, equilibrium and acids and bases. Organic chemistry is further developed in the context of aromatic chemistry, isomerism and the reactions of several functional groups. You also carry out experimental and investigative activities integrated with the theory to develop your practical skills.

Physics

This module develops your understanding of physics as a preparation for physics based courses at the university. You will develop an understanding of electricity and magnetism including the principles of electromagnetism. You will cover topics such as electric circuits; forces and momentum and the basic

concepts of nuclear physics and radioactive decay. You will develop your skills of selection and use of appropriate formulae for calculations and recording and analysis of data from practical work.

Statistics

This module gives you the opportunity to work with descriptive statistics, probability theory and some statistical inference. Descriptive statistics will include the study of averages (such as the mean, mode and median) and of measures of dispersion (such as the standard deviation) and the use and interpretation of statistical graphs. The study of probability theory covers the use of formal set notation, tree diagrams, conditional probability and the evaluation of simple normal probabilities. You will learn the study of statistical inference including the use of rank correlation and at least one of the non-parametric sign tests.

Applied and Environmental Biology

In this module you will study the principles of genetics and gene technology; you will relate these to the ways in which they are applied commercially; and will examine the impact of agriculture on plant cultivation and basic ecology. There may be opportunities to explore current topics through public or professional lectures by leading scientists in this field. This module will provide you with the opportunity for further study in biology, and is particularly suitable for students wishing to study a degree in biology or environmental science.

An academic year is divided into two semesters; "A" which is September to January, "B" which is January to June.

Semester A	Introductory Biology	Introductory Chemistry	Introductory Physics	Mathematics for Scientists or Mathematics
Semester B	Individual Project	Choose from: Mammalian Physiology, Applied and Environmental Biology, Chemistry, Physics, Mathematics, Statistics and Advanced Mathematics.		

Extended degree in Engineering

The programme is offered in Hertford Regional and Oaklands Colleges and it is split into semesters (A and B). * After your successful first year, you can progress to a wider range of engineering programmes, including but not confined to mechanical, motor, sport, automotive, aerospace and electronic engineering. See website for full list and UCAS codes.

Semester A

Digital and Software Applications in Engineering

This module provides an opportunity for students to acquire competence in using appropriate computer software to, for example, solve problems, prepare reports and presentations and gather, analyse and present experimental data.

Engineering Science

The module provides the basic physics and chemistry necessary for the study of mechanical systems, materials selection and the understanding of the generation, transmission and application of electricity.

Engineering Studies and Skills

This module exposes you to the various engineering disciplines through a series of guided laboratory experiments conducted in both of the Engineering Schools at the University. There are industrial visits and also a series of guest presentations from prestigious industrialists from the various industrial disciplines.

Entry requirements

The normal entry requirements for the programme are: 120 points made up of at least one A level (A2), a BTEC National Award or equivalent. Plus GCSEs at Grade C or above in mathematics, English language and science or equivalent. Applicants returning to study with equivalent qualifications or relevant work experience will be welcome to apply.

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What will I learn?

The content is broad with a core of mathematics and technology and an emphasis on the application of engineering. During the initial year, you spend four days a week at one of the two partner colleges that you choose to study at - Hertford Regional or Oaklands*. On the other day, you come to the University for laboratory sessions where you carry out practical engineering work and develop an engineering project of your own.





An academic year is divided into two semesters; "A" which is September to January, "B" which is January to June.

Semester A	Digital and Software Applications in Engineering	Engineering Science	Engineering Studies and Skills	Mathematics 1
Semester B	Electrical Science and Digital Technology	Mathematics 2	Mechanical Science	Individual Project

Mathematics 1

Mathematics is a fundamental and important element of engineering, allowing the description and analysis of physical systems and their behaviour. This course provides competence in mathematics, essential for further study of each of the engineering disciplines.

Semester B

Electrical Science and Digital Technology

This module develops your knowledge in the theory and application of basic Electrical and Electronic Science and will enable you to gain an appreciation of the technical requirements of Digital Application Technologies in a range of engineering scenarios.

Mathematics 2

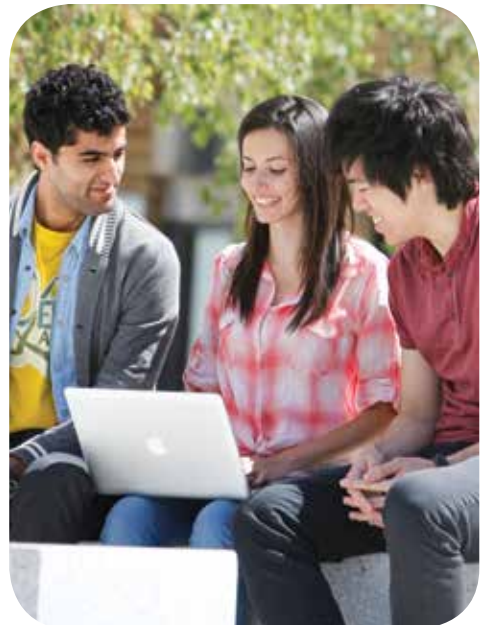
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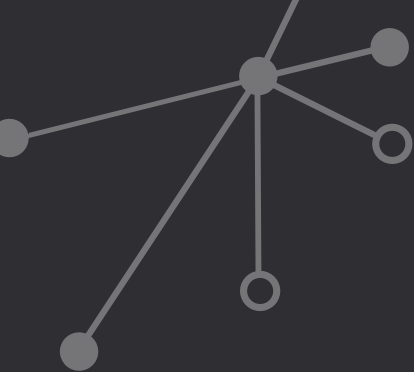
Mechanical Science

With this module you gain a solid introduction to properties of material such as metals, polymers and ceramics.

Individual Project

This gives you the opportunity to conduct specialist research on a specific engineering or technology problem. Working as a small team, and with guidance from your supervisor, you are required to analyse the problem, identify and implement solutions and report your findings in a formal manner.





For further information

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