

Title of Programme: BEng (Hons) Electrical and Electronic Engineering

Programme Code: **XXXXXX**

For Collaborative: Franchise at Hertfordshire College, Changzhou Institute of Technology, China

# Programme Specification

This programme specification is relevant to students entering:  
01 September 2024

Associate Dean of School (Academic Quality Assurance):  
Mariana Lilley

Signature

A programme specification is a collection of key information about a programme of study (or course). It identifies the aims and learning outcomes of the programme, lists the modules that make up each stage (or year) of the programme, and the teaching, learning and assessment methods used by teaching staff. It also describes the structure of the programme, its progression requirements and any programme-specific regulations. This information is therefore useful to potential students to help them choose the right programme of study, to current students on the programme, and to staff teaching and administering the programme.

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**Summary of amendments to the programme:**

Section	Amendment

If you have any queries regarding the changes, please email [AQO@herts.ac.uk](mailto:AQO@herts.ac.uk)

# Programme Specification BEng (Hons) Electrical and Electronic Engineering

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This programme specification (PS) is designed for prospective students, enrolled students, academic staff and potential employers. It provides a concise summary of the main features of the programme and the intended learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. More detailed information on the teaching, learning and assessment methods, learning outcomes and content for each module can be found in Definitive Module Documents (DMDs).

## Section 1

<b>Awarding Institution/Body</b>	University of Hertfordshire
<b>Teaching Institution</b>	Hertfordshire College, CIT
<b>University/partner campuses</b>	Hertfordshire College, CIT
<b>Programme accredited by</b>	Not applicable
<b>Final Qualification</b>	BEng Hons
<b>All Final Award titles (Qualification and Subject)</b>	Electrical and Electronic Engineering
<b>FHEQ level of award</b>	6

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### A. Programme Rationale

The BEng (Hons) in Electrical and Electronic Engineering programme, offered by the University of Hertfordshire through its franchise partner, Hertfordshire College, CIT enables students to develop knowledge and skills in a range of topics, such as digital signal processing, microelectronic and VLSI (very-large-scale integration) design practice, robotics and neural networks, power systems applications, and advanced power conversion and control application trends.

Furthermore, as China rapidly advances with its industrialisation initiatives, the presence of qualified professionals in Electrical and Electronic Engineering becomes crucial, making this programme a timely and valuable option for the China employment context.

Graduates can expect to gain employment across a wide range of industries that require the skills of an electrical and electronic engineer. These industries include communications, computing, manufacture, defence, aerospace and automotive. Alternatively, graduates may continue their education to a post-graduate level and the University of Hertfordshire has a range of taught MSc or research awards that graduates may consider.

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### B. Educational Aims of the Programme

#### Diversity and Inclusion

Our programmes are purposefully designed to enable all students to engage meaningfully with the curriculum by being accessible and representative. We will support students to shape their learning experience, removing barriers and enabling them to succeed. The curriculum explicitly includes multiple and representative perspectives, valuing collective identities and individual diversity. Learning, teaching and assessment activities help students to understand how they can enhance outcomes both for themselves and for others. All students belong to a learning community, and during their studies we really want to hear their voices, encourage them to listen to others, and express themselves.

The programme has been devised in accordance with the University's graduate attributes of programmes of study as set out in [UPR TL03](#).

**Additionally, this programme aims to:**

- provide a high-quality education in electrical and electronic engineering;
- provide an education for the individual which enhances their prospects of professional employment in engineering and business both in national and international industries;
- provide studies which develop an awareness of, and underpinning knowledge and understanding of a broad range of Electrical and Electronic Engineering areas of expertise;
- provide studies which enable the student to attain a high level of expertise in a range of topics specific to their named award.

**Graduate Attributes**

Our graduates will be capable and professional, creative and enterprising, and will build their social and global awareness throughout. In addition to their subject expertise and proficiency, as a University of Hertfordshire graduate, they will be:

- Professionally focused
- Globally minded
- Sustainability driven
- Digitally capable and confident
- Inclusive and collaborative
- Evidence based and ethical

**C. Intended Learning Outcomes**

The programme provides opportunities for students to develop and demonstrate knowledge and understanding, skills and other attributes in the following areas. The programme outcomes are referenced to the QAA benchmark statements for Engineering and the Frameworks for Higher Education Qualifications of UK Degree-Awarding Bodies (2014) and relate to the typical student. Additionally, the SEEC Credit Level Descriptors for Further and Higher Education (2021) have been used as a guiding framework for curriculum design.

Knowledge and Understanding	Teaching and learning methods	Assessment strategy
A1- Demonstrate knowledge and understanding of the analytical methods employed by Engineers. A2- Demonstrate knowledge and understanding of the fundamental engineering sciences. A3- Demonstrate knowledge and understanding of the design principles and design-to-build processes appropriate to electrical and electronic systems. A4- Demonstrate knowledge and understanding of the basic principles and economic, social, legal, ethical and sustainability considerations of the business of engineering. A5- Demonstrate knowledge and understanding of professional engineering practice principles.	Acquisition of knowledge and understanding is through the following approaches:  Acquisition of A1 and A2 is through a combination of lectures, small group tutorials, coursework, and laboratory work at levels 4 and 5 of the programme.  Specialist aspects of A2 are further developed at level 6.  Acquisition of A3, A4, and A5 is through a combination of lectures, projects and coursework throughout the programme.  Staff deploy a range of teaching and learning strategies in the most appropriate way for each individual module. A more didactic approach will tend to be adopted at lower levels, in particular for A1 and A2. An increasingly self-directed and	Knowledge and understanding are assessed through a combination of unseen examinations (A1, A2, A3 and A5) and in-course assessments (A1-A5) in the form of laboratory reports, essays and phase tests. Some aspects of A3 and A4 are assessed by design exercises and project reports and presentations. At level 6 some aspects of A5 are assessed by case study reports.

	<p>interactive approach will be adopted at higher levels, particularly for A3, A4 and A5.</p> <p>Throughout, the learner is encouraged to undertake independent study both to supplement and consolidate what is being taught/learnt and to broaden their individual knowledge and understanding of the subject.</p>	
<b>Intellectual skills</b>	<b>Teaching and learning methods</b>	<b>Assessment strategy</b>
<p>B1- Analyse and solve electrical and electronic engineering problems using appropriate techniques.</p> <p>B2- Model and analyse engineering systems.</p> <p>B3- Select appropriate computer-based methods for engineering and communication.</p> <p>B4- Evaluate external influences on the design process.</p> <p>B5- Design electrical and electronic systems, components or processes.</p>	<p>Intellectual skills are developed through the programme by the methods and strategies outlined for section A of the intended learning outcomes above, again moving from a more didactic approach to an increasingly self-directed and interactive approach at higher levels, particularly for B3, B4 and B5.</p> <p>Analysis, problem solving and modelling skills (B1 and B2) are further developed through tutorial work, laboratory work, in-course exercises and project work.</p> <p>Design and IT skills (B3-B5) are further developed through project work, design exercises and some case study work at level 6.</p> <p>Feedback is given to all students on all coursework produced.</p> <p>Throughout, the learner is encouraged to develop intellectual skills further by independent study</p>	<p>Intellectual skills B1, B2 and B5 are assessed through unseen examination papers, laboratory reports and coursework related to in-course exercises.</p> <p>Intellectual skills B3 and B4 are assessed through project reports and presentations.</p>
<b>Practical skills</b>	<b>Teaching and learning methods</b>	<b>Assessment strategy</b>
<p>C1- Apply analytical and modelling techniques to solve engineering problems.</p> <p>C2- Perform experimental work in electrical and electronic engineering and draw conclusions.</p> <p>C3- Use computer-based engineering tools.</p> <p>C4- Prepare and evaluate technical documentation.</p> <p>C5- Evaluate the design of electrical and electronic</p>	<p>Practical skills are developed through the programme by the methods and strategies outlined in sections A and B of the intended learning outcomes above, again moving from a more didactic approach to an increasingly self-directed and interactive approach at higher levels, particularly for C4, C5 and C6.</p> <p>C1 is developed through laboratory work, coursework assignments and tutorial work.</p>	<p>Practical skills are assessed through laboratory reports, coursework assignments, design exercise submissions, case study reports, presentations, project reports and logbooks.</p>

<p>systems, components or processes.</p> <p>C6- Plan and manage a project, considering economic, social, legal, ethical and sustainability constraints.</p>	<p>C2 is developed through laboratory work.</p> <p>C3 is developed through the use of software simulation tools at all levels.</p> <p>C4 is developed through project work, lab exercises and software documentation, particularly at level 4.</p> <p>C5 is developed through laboratory work at levels 5 and 6.</p> <p>C6 is developed through lectures and project work.</p>	
Transferable skills	Teaching and learning methods	Assessment strategy
<p>D1- Communicate effectively, both orally and in writing.</p> <p>D2- Use commonly available IT tools.</p> <p>D3- Manage time and resources effectively.</p> <p>D4- Work effectively within a team as a member.</p> <p>D5- Manipulate, sort and present data.</p> <p>D6- Solve problems in a logical manner.</p> <p>D7- Learn effectively and independently, in all aspects of life.</p>	<p>Transferable skills are developed through the programme by the methods and strategies outlined in sections A, B and C of the intended learning outcomes above.</p> <p>D1 is developed through feedback on coursework reports, oral presentations and project reports.</p> <p>D2 is developed through their use in preparing project reports, laboratory reports, case studies, design work, etc.</p> <p>D3 is developed through project work planning and throughout the programme.</p> <p>D4 is developed through group project and assignment work.</p> <p>D5 and D6 are developed through lectures and tutorial work throughout the programme.</p> <p>D7 is developed and promoted throughout the programme.</p> <p>Throughout, the learner is encouraged to develop transferable skills by maintaining a record of evidence and completing a personal development plan.</p>	<p>D1, D2, D5 and D6 are assessed through coursework, individual major project and technical reports and oral presentations.</p> <p>D4 is assessed by review of group project work.</p> <p>D3 and D7 are specifically assessed by review of an individual's progress during individual major project work.</p>

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## **D. Programme Structures, Features, Levels, Modules, and Credits**

The programme is offered in full-time (3 years) mode and leads to the award of a BEng Degree with Honours in Electrical and Electronic Engineering. Intake is normally A(September).

### **Professional and Statutory Regulatory Bodies**

N/A

### **Work-Based Learning, including Sandwich Programmes**

N/A

### **Student Exchange programme**

#### **Incoming Exchange**

N/A

### **Study Abroad**

N/A

### **Programme Structure**

The programme structure and progression information below (Table 1a and 1b) are provided for the Honours award. Any interim awards are identified in Table 1b. The Programme Learning Outcomes detailed above are developed and assessed through the constituent modules. Table 2 identifies where each learning outcome is assessed.

## Table 1a Outline Programme Structure

**Mode of study:** Full Time

**Entry point:** Semester A (September)

### Level 4

<b>Compulsory Modules</b> Module Title	Module Code	Credit Points	% Test	% Examination	% Coursework	% Practical	Semesters
Engineering Mathematics	4FTC2136	15	0	60	40	0	A
Digital Electronic Circuits	4FTC2137	15	0	50	50	0	A
Circuit Theory and Analysis	4FTC2138	15	50	0	50	0	A
Project Planning and Design	4FTC2139	15	0	0	100	0	A
Professional Engineering	4FTC2140	15	0	0	100	0	B
Programming	4FTC2141	15	0	0	100	0	B
Analogue Circuits and Devices	4FTC2142	15	0	50	50	0	B
Electronic Product Development	4FTC2143	15	0	0	100	0	B

Progression to level 5 requires a minimum of 90 credits. The maximum study rate in such an instance would be 150 credits and students would be expected to redeem any failed modules at the first available opportunity.

### Level 5

<b>Compulsory Modules</b> Module Title	Module Code	Credit Points	% Test	% Examination	% Coursework	% Practical	Semesters
Signals and Systems	5FTC2176	15	0	60	40	0	A
Digital Design and Embedded Systems	5FTC2177	15	0	60	40	0	A
Electric Power and Energy Conversion	5FTC2178	15	0	60	40	0	A
Analogue and Mixed-Signal Design	5FTC2179	15	0	0	100	0	A
Real-time Systems and Programming	5FTC2180	15	0	0	100	0	B
Connected Systems and IoT	5FTC2181	15	0	0	100	0	B
Mechatronics	5FTC2182	15	0	50	50	0	B
Communication System Principles	5FTC2183	15	0	60	40	0	B

Progression to level 6 requires 210 credits, including 90 credits at level 5. The maximum study rate in such an instance would be 150 credits and students would be expected to redeem any failed modules at the first available opportunity.

## Level 6

Module Title	Module Code	Credit Points	% Test	% Examination	% Coursework	% Practical	Semesters
<b>Compulsory Modules</b>							
Microelectronics and VLSI	6FTC2185	15	0	60	40	0	A
Intelligent Systems and Robotics	6FTC2186	15	50	0	50	0	A
Digital Communication Systems	6FTC2187	15	0	60	40	0	A
Digital Signal Processing	6FTC2188	15	0	60	40	0	B
Power Systems and Renewable Energy	6FTC2189	15	40	0	60	0	B
Wireless Networking	6FTC2190	15	50	0	50	0	B
BEng Individual Project (Electrical)	6FTC2191	30	0	0	80	20	AB

The award of an Honours degree in Electrical and Electronic Engineering requires 360 credit points including 240 at level 6/5 of which 120 must be at level 6.

### Honours classification

The University has approved structure and assessment regulations common to all programmes. Full details are provided in [UPR AS14](#), Section D. However, this programme has specific regulations relating to the determination of Honours classification given under the Programme-Specific Regulations at the end of Section D.

Table 1b Final and interim awards available

The programme provides the following final and interim awards:

Final Award	Award Title	Minimum requirements	Available at end of Level	Programme Learning Outcomes developed (see above)
BEng (Hons)	Electrical and Electronic Engineering	360 credit points including 240 at level 6/5 of which 120 must be at level 6	6	All programme learning outcomes (see Table 2)
Interim Award	Award Title	Minimum requirements	Available at end of Level	Programme Learning Outcomes developed (see above)
University Certificate		45 credit points at level 4	4	See UPR AS11, section 13: <a href="http://sitem.herts.ac.uk/secreg/upr/AS11.htm">http://sitem.herts.ac.uk/secreg/upr/AS11.htm</a>
Certificate of Higher Education		120 credit points at level 4	4, 5	See UPR AS11, section 13: <a href="http://sitem.herts.ac.uk/secreg/upr/AS11.htm">http://sitem.herts.ac.uk/secreg/upr/AS11.htm</a>
Diploma of Higher Education		240 credit points including at least 120 at level 5	5, 6	See UPR AS11, section 13: <a href="http://sitem.herts.ac.uk/secreg/upr/AS11.htm">http://sitem.herts.ac.uk/secreg/upr/AS11.htm</a>
BEng	Electrical and Electronic Engineering	300 credit points including 180 at level 6/5 of which 60 must be at level 6	6	A subset of programme learning outcomes for the award (see Table 2), depending on modules passed.



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## Programme-specific assessment regulations

The programme complies with the University's academic regulations (in particular, [UPR AS11](#), [UPR AS13](#) and [UPR AS14](#)) with the exception of those listed below, which have been approved by the University:

- Students exiting with a BEng (Hons) award shall have their degree classification determined in accordance with [UPR AS14](#) and include the individual project in the calculation of degree.

Course Code	Course Instance	Award Title	Modules (child instance codes & title)	Must be included in classification algorithm?
XXXXX	XXXXX	BEng (Hons) Electrical and Electronic Engineering	BEng Individual Project (Electrical) 6FTC2191	yes

- Additionally, students who are offered a re-enrolment opportunity on BEng Individual Project (Electrical) 6FTC2191, will normally be allocated an entirely different project in their repeat opportunity.

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## **E. Management of Programme & Support for student learning.**

### **Management**

The programme is managed and administered through:

- Dean of Hertfordshire College, CIT.
- UH Executive Dean.
- UH SPECS International Franchise Manager.
- Associate Dean (AQA, Learning and Teaching) of Hertfordshire College, CIT.
- Associate Dean (Student Experience) of Hertfordshire College, CIT.
- The Programme Leader at Hertfordshire College, CIT who has overall responsibility for the effective operationalisation of the programme, ensuring that academic standards are maintained, and an effective student learning experience is provided. The Programme Leader is also responsible for chairing the programme committee.
- A Collaborative Partnership Leader, based at UH, to provide support and facilitate communication between UH and Hertfordshire College, CIT.
- Module leaders at Hertfordshire College, CIT who are responsible for individual modules.
- A Programme committee that includes the above key stakeholders and student representatives.
- An Admissions Tutor at Hertfordshire College, CIT with specific responsibility for admissions and open days, where necessary, liaise with UH CPL and/or admissions tutor regarding special admissions cases.
- A designated administrative team to deal with day-to-day administration associated with the modules within the programme.

### **Support**

Students are supported by:

- An induction week at the beginning of each new academic session.
- A Programme Handbook which provides information about the programme, the support services available and the calendar of events for the year.
- A Student Development Centre that provides advice on issues such as finance, accommodation, University regulations, study abroad, etc.
- A Student Support Hub which includes full-time Personal Tutor(s) and Assistant Programme Leader(s) who will be an important point of contact. Personal Tutor(s) can provide advice on non-academic issues, Assistant Programme Leader(s) can provide one-on-one guidance on academic issues.
- A versatile on-line inter-active intranet and learning environment.
- Guided student-centred learning on Canvas module sites.
- Access to extensive digital and print collections of information resources.
- Attractive modern study environment in library.
- An Academic Support Hub which includes academic English support, Maths support, computer programming support, technical writing support.
- Technical support staff and access to computer and technical laboratories.
- Programme Leader who can advise on programme issues.
- Module teaching teams who provide academic support.
- A project supervisor.
- A Careers and Employment Office that supports students looking for graduate employment.
- A Special-needs Support Office that assists students with various special needs.
- Medical Centre.
- Mental Health Advisory Support Office.
- Changzhou Institute of Technology Student's Union.
- Dedicated programme site.

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## **F. Other sources of information**

In addition to this Programme Specification, Hertfordshire College, CIT publishes guidance to registered students on the programme and its constituent modules:

- A dedicated programme site;
- A Definitive Module Document (DMD) for each constituent module;

The Programme Handbook provides information on a wide range of resources and services available at the Hertfordshire College, CIT including academic support, accommodation, fees, funding, wellbeing services and student societies.

As a condition of registration, all students of the University of Hertfordshire are required to comply with the University's rules, regulations and procedures. These are published in a series of documents called 'University Policies and Regulations' (UPRs). The University requires that all students consult these documents which are available on-line, on the UPR web site, at: <http://www.herts.ac.uk/secreg/upr/>. In particular, [UPR SA07](#) 'Regulations and Advice for Students' Particular Attention - Index' provides information on the UPRs that contain the academic regulations of particular relevance for undergraduate and taught postgraduate students.

In accordance with section 4(5) of the Higher Education and Research Act 2017 (HERA), the UK Office for Students (OfS) has registered the University of Hertfordshire in the register of English higher education providers. The Register can be viewed at: <https://www.officeforstudents.org.uk/advice-and-guidance/the-register/the-ofs-register/>.

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## G. Entry requirements

Level 4 Entry:

- Applicants should have passed the minimum control line for undergraduates on the National College Entrance Examination (NCEE), which must include Mathematics and Physics.

Plus:

- Demonstrate a proficiency in English to IELTS 6.0 with minimum 5.5 in each band or an equivalent recognised qualification (including pass the Pre-Sessional English course).

Entry is only at level 4.

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If you would like this information in an alternative format please contact:  
[cpuadmin@herts.ac.uk](mailto:cpuadmin@herts.ac.uk)

If you wish to receive a copy of the latest External Examiner's Report for the programme, please email a request to [aqo@herts.ac.uk](mailto:aqo@herts.ac.uk)



## KEY TO PROGRAMME LEARNING OUTCOMES

### Knowledge and Understanding

- A1. The analytical methods employed by engineers.
- A2. The fundamental engineering sciences.
- A3. The design principles and design-to-build processes appropriate to electrical and electronic systems.
- A4. The basic principles and economic, social, legal, ethical and sustainability considerations of the business of engineering.
- A5. Professional engineering practice.

### Intellectual Skills

- B1. Analyse and solve Electrical and Electronic Engineering problems using appropriate techniques.
- B2. Model and analyse engineering systems.
- B3. Select appropriate computer-based methods for engineering and communication.
- B4. Evaluate external influences on the design process.
- B5. Design appropriate electrical and electronic systems, components, or processes.

### Practical Skills

- C1. Apply analytical and modelling techniques to solve engineering problems.
- C2. Perform experimental work in Electrical and Electronic Engineering and draw conclusions.
- C3. Use computer-based engineering tools.
- C4. Prepare technical documentation.
- C5. Evaluate the design of electrical and electronic systems, components, or processes.
- C6. Plan and manage a project, taking into account economic, social, legal, ethical and sustainability constraints.

### Transferable Skills

- D1. Communicate effectively, both orally and in writing.
- D2. Use commonly available IT tools.
- D3. Manage time and resources effectively.
- D4. Work effectively within a team as a member.
- D5. Manipulate, sort and present data.
- D6. Solve problems in a logical manner.
- D7. Learn effectively and independently, in all aspects of life.

**Table 3: Development of Graduate Attributes in the Constituent Modules**

This map identifies where the Graduate Attributes are delivered in the constituent modules. It provides (i) an aid to academic staff in understanding how individual modules contribute to the development of the Graduate Attributes (ii) a checklist for quality control purposes and (iii) a means to help students monitor their own personal and professional development as the programme progresses. [Note that there is no requirement for the Graduate Attributes to be assessed through these modules]

D = Delivered

	Module Title	Module Code	Professionally Focused	Globally Minded	Sustainability Driven	Digitally capable & confident	Inclusive and collaborative	Evidenced based and Ethical
Level 4	Engineering Mathematics	4FTC2136	D			D		D
	Digital Electronic Circuits	4FTC2137	D		D	D		D
	Circuit Theory and Analysis	4FTC2138	D			D		D
	Project Planning and Design	4FTC2139	D			D	D	D
	Professional Engineering	4FTC2140	D	D	D	D	D	D
	Programming	4FTC2141	D			D		D
	Analogue Circuits and Devices	4FTC2142	D			D		D
	Electronic Product Development	4FTC2143	D			D	D	D
Level 5	Signals and Systems	5FTC2176	D			D		D
	Digital Design and Embedded Systems	5FTC2177	D			D		D
	Electric Power and Energy Conversion	5FTC2178	D		D	D		D
	Analogue and Mixed-Signal Design	5FTC2179	D			D	D	D
	Real-time Systems and Programming	5FTC2180	D			D		D
	Connected Systems and IoT	5FTC2181	D			D	D	D
	Mechatronics	5FTC2182	D			D		D
	Communication System Principles	5FTC2183	D			D		D
Level 6	Microelectronics and VLSI	6FTC2185	D			D		D
	Intelligent Systems and Robotics	6FTC2186	D			D		D
	Digital Communication Systems	6FTC2187	D			D		D
	Digital Signal Processing	6FTC2188	D			D		D
	Power Systems and Renewable Energy	6FTC2189	D		D	D	D	D
	Wireless Networking	6FTC2190	D			D		D
	BEng Individual Project (Electrical)	6FTC2191	D		D	D		D

## Section 2

### Programme management

<b>Relevant QAA subject benchmarking statements</b>	Electrical and Electronic Engineering
<b>Type of programme</b>	Undergraduate
<b>Date of validation/last periodic review</b>	April 24
<b>Date of production/ last revision of PS</b>	February 2024
<b>Relevant to level/cohort</b>	Level 4 entering September 2024
<b>Administrative School</b>	School of Physics, Engineering & Computer Science
<b>Language of Delivery</b>	English

**Table 4 Course structure**

Course details			
Course Code	Course Description	HECOS	UCAS
XXXX	BEng (Hons) Electrical and Electronic Engineering	100163	N/A