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PROGRAMME SPECIFICATION

Course record information

Name and level of final awards:	**BSc Honours Biomedical Electronic and Instrumentation Engineering** **BSc Honours Biomedical Electronic and Instrumentation Engineering (with Industrial Placement)** **BSc Honours Computer Systems Engineering,** **BSc Honours Computer Systems Engineering (with Industrial Placement)** **BSc Honours Electronic Engineering** **BSc Honours Electronic Engineering (with Industrial Placement)** These BSc degrees are Bologna FQ-EHEA first cycle degree or diploma compatible.
Name and level of intermediate awards:	BSc Biomedical Electronic and Instrumentation Engineering BSc Biomedical Electronic and Instrumentation Engineering (with Industrial Placement) BSc Computer Systems Engineering, BSc Computer Systems Engineering (with Industrial Placement) BSc Electronic Engineering BSc Electronic Engineering (with Industrial Placement) Diploma of HE in Electronic System Engineering Certificate of HE in Electronic System Engineering
Awarding body/institution:	University of Westminster
Teaching Institution:	University of Westminster
Status of awarding body/institution:	Recognised Body

Location of delivery:	Central London, New Cavendish Street
Language of delivery and assessment:	English
Mode, length of study and normal starting month:	Full time/Placement: 3/4 yrs. September start.
QAA subject benchmarking group(s):	Engineering
Professional statutory or regulatory body:	Institution of Engineering and Technology IEng
Date of course validation/review:	2015
Date of programme specification approval:	2015
Valid for cohorts :	2016/17 Levels 4 and 5; 2017/18 Levels 4,5 and 6
Course Leader	Dr Viv Bartlett
UCAS code and URL:	Bio Electronic & Inst Eng: H610 H61? (with Foundation) Computer Systems Eng: H657 H656 (with Foundation) Electronic Engineering: H601 H607 (with Foundation) westminster.ac.uk/courses/undergraduate

What are the minimum entry requirements for these programmes?

There are standard minimum entry requirements for all undergraduate courses. Students are advised to check the standard requirements for the most up-to-date information.

westminster.ac.uk/courses/undergraduate/how-to-apply

For most courses a decision will be made on the basis of your application form alone. However, for some courses the selection process may include an interview to demonstrate your strengths in addition to any formal entry requirements.

More information can be found here: westminster.ac.uk/courses/undergraduate/how-to-apply

What are the aims of these programmes?

The BSc Honours programmes in Biomedical Electronic and Instrumentation Engineering, in Computer System Engineering and in Electronic Engineering form an integrated suite of engineering degree courses aimed to provide an inspiring learning experience with a

curriculum that is highly relevant to the needs of industry and leading to many employment opportunities.

The emphasis of these programmes is on the design, operation, installation and maintenance of current and future state-of-the-art electronic and computer systems. This is supported by developing a working knowledge of the underpinning analytical foundations of these technologies and the technical and interpersonal skills necessary to allow the graduate to adapt to future technological developments.

These are ***systems-oriented*** programmes. That is, they focus on how components are combined to form systems rather than the internal physical structure of the component devices. Of course, a working knowledge of the internal operation and characteristics of these components is provided in order to understand how they can be used and their limitations.

These programmes aim to:

- provide an exciting, enjoyable and rewarding learning experience which will serve as a solid foundation for a professional engineering career leading eventually to registration as an Incorporated Engineer (IEng);
- encourage initiative and confidence in approaching engineering problems and adoption of an investigative approach to their solution using a blend of analytical and practical skills;
- develop skills in presentation of technical work, the interpersonal and organisational requirements associated with carrying out an engineering project, and an appreciation of the industrial and social context of the technology;
- give an understanding of the role and responsibilities of the professional engineer to society and the environment;
- engender the communication and interpersonal skills necessary for operation in a professional engineering environment and to provide an education that allows graduates to adapt the future changes in technology.

The supplementary aims of the industrial placement mode of attendance are to provide graduates with relevant workplace experience and to launch their initial professional development with a view to becoming an Incorporated Engineer.

BSc Honours Biomedical Electronic and Instrumentation Engineering

The BSc Honours programme in Biomedical Electronic and Instrumentation Engineering has been designed to meet the demand from employers for graduates with practical, application-oriented engineering skills and know-how. It aims to provide a solid understanding of the fundamentals of biomedical electronic principles, enabling the students to offer solutions for issues related to the design and development of diagnostic and therapeutic medical equipment. In particular, it is targeted towards the rapidly growing and changing healthcare industry occupied in interdisciplinary specialisation in biomedical electronics and instrumentation.

In addition to the aims listed above, this programme specifically aims to:

- equip students with knowledge and understanding of analog and digital circuits, embedded computer systems and signal processing to the specification, analysis, maintenance and design of diagnostic and therapeutic biomedical instrumentation;

- establish a working knowledge of the physical principles, algorithms and sensor techniques that underpin the operation of diagnostic and therapeutic biomedical instrumentation;

- develop the skills required to install, maintain and adapt electronic biomedical instrumentation systems.

BSc Honours Computer Systems Engineering

The BSc Honours programme in Computer Systems Engineering has been designed to equip students with the knowledge and skills as well as embracing the structure, design and efficient operation of the modern day computer as well as that of embedded microprocessors, peripheral devices and associated operational and supervisory software. The course is underpinned with a sound knowledge of digital systems, and electronic circuit techniques.

In addition to the aims listed above, this programme specifically aims to:

- equip students with knowledge and understanding of modern computer architectures and peripherals, real-time programming and bus protocols to the specification, analysis, maintenance and design of computer systems;

- establish a knowledge of the electronic and computational principles underpinning computer systems, embedded systems, systems programming and real-time systems;

- develop the skills required to install, maintain and adapt computer systems.

BSc Honours Electronic Engineering

The BSc Honours programme in Electronic Engineering has been designed to meet the demand from employers for graduates with practical, application-oriented engineering skills and know-how. In particular, it is targeted towards the rapidly growing and changing industries involving electronic and telecommunication systems. Because of the interest in these technologies among students without the “traditional” engineering background of advanced mathematics and physics, the course is designed to include teaching of these underpinning skills.

In addition to the aims listed above, this programme specifically aims to:

- equip students with knowledge and understanding of analog and digital circuits, embedded computer systems and communication protocols and services to the specification, analysis, maintenance and design of electronic and communication systems;
- establish the fundamental principles of electronics, signal processing and computing, and develop the practical connections between these when applied to a broad range of engineering systems;

- develop the skills required to install, maintain and adapt electronic and communication components and systems.

What will you be expected to achieve?

Learning outcomes are statements on what successful students have achieved as the result of learning. These are threshold statements of achievement the learning outcomes broadly fall into four categories:

- The overall **Knowledge and Understanding** students will gain from the programme (KU).
- **Graduate Attributes** are characteristics that students will have developed during the duration of the programme (GA).
- **Professional and Personal Practice learning outcomes** are specific skills that students will be expected to have gained on successful completion of the programme (PPP).
- **Key Transferable Skills** that students will be expected to have gained on successful completion of the programme (KTS).

Level 4 learning outcomes – BSc Honours Biomedical Electronic and Instrumentation Engineering and BSc Honours Electronic Engineering Upon completion of Level 4 the student will be able to:

LS4.1 apply fundamental physical, electrical and mathematical laws to the analysis of simple electronic circuits and computer systems (KU, PPP);

LS4.2 design, implement, debug and test, given prescribed methods, simple analog and digital circuits, programs in high-level and low-level languages and mathematical models of signal processing and communication systems (KU);

LS4.3 represent in words, mathematics and diagrams electronic, software and mathematical concepts, and use these in the description and analysis of simple systems (KU, KTS);

LS4.4 demonstrate a knowledge of current technology, applications and techniques in the fields of electronics, communications and computer systems (KU);

LS4.5 use published technical information and perform practical electronic and computer laboratory investigations and design tasks using standard laboratory equipment (GA, PPP);

LS4.6 work and manage learning required for structured group tasks, given direction and guidance, collaborating in the production of practical products and documentation and keeping to set deadlines (GA, KTS);

LS4.7 communicate non-complex technical information correctly, by means of presentations, written reports, appropriate diagrams and discussion (GA, KTS).

Level 4 learning outcomes – BSc Honours Computer System Engineering Upon completion of Level 4 the student will be able to:

LC4.1 apply software design principles and methodology to the structuring and design of software systems;

LC4.2 design, implement, debug and test, simple programs in high-level and low-level languages given prescribed methods (KU, PPP);

LC4.3 represent in words, mathematics and diagrams electronic, software and mathematical concepts, and use these in the description and analysis of simple systems (KU, KTS);

LC4.4 demonstrate a knowledge and understanding of current technology in computer systems, applications and techniques as taught (KU, GA);

LC4.5 analyse simple real-world problems and synthesise appropriate solutions using given engineering techniques including the gathering and assimilation of information as directed and apply it as instructed (KU, KTS);

LC4.6 work and manage learning required for structured group tasks, given direction and guidance, collaborating in the production of practical products and documentation and keeping to set deadlines (GA, KTS);

LC4.7 communicate technical information correctly, by means of presentations, written reports, appropriate diagrams and discussion (KTS, GA).

Level 5 learning outcomes – BSc Honours Biomedical Electronic and Instrumentation Engineering

Upon completion of Level 5 students will be able to:

LB5.1 use the mathematical principles underpinning the operation of digital and analog electronic circuits and systems and demonstrate knowledge of current technology, some of its applications and its design techniques (KU);

LB5.2 design, implement, debug and test, selecting from well-defined methods, analog and digital circuits, programs in high and low-level languages and mathematical models of systems for biomedical systems (KU, PPP);

LB5.3 analyse, design, assemble and program embedded processors for real-time applications (KU, PPP);

LB5.4 communicate complex technical information succinctly and accurately, by means of presentations, written reports, appropriate diagrams and discussion (GA, KTS);

LB5.5 gather, assimilate, analyse and evaluate technical information, with guidance, and apply it appropriately to managing project work, adhering to prescribed requirements and deadlines (GA, KTS);

LB5.6 describe and understand the underlying scientific and biological concepts for biomedical electronics including human anatomy and physiology, medical physics, physics of biological structures and bio molecular elements, (GA, KTS);

LB5.7 explain knowledge of and demonstrate familiarity with the commercial, economic and social context of engineering, including environmental and sustainability limitations, health and safety and risk-assessment issues as well as management techniques and ethical considerations (KU, GA);

LB5.8 analyse and evaluate the functionality of biosensors, transducers and electrodes for physiological measurements and bio-engineering design principles for the implementation of therapeutic and diagnostic instruments. (GA, KTS, PPP).

Level 5 learning outcomes – BSc Honours Computer System Engineering Upon completion of Level 5 students will be able to:

LC5.1 apply mathematical laws & knowledge of current technology, applications, standards and techniques, to specify, select and configure computer system interface bus solutions (KU, PPP);

LC5.2 demonstrate an awareness of the industrial and social context of computer system engineering (GA);

LC5.3 analyse and apply given real-world requirements and synthesise appropriate solutions from standard engineering techniques (GA, KTS);

LC5.4 adopt a structured approach to an engineering problem, thus making decisions selecting from well-defined methods, design, implement, debug and test circuits, computer networks and programs using high-level and low-level languages (PPP, KU);

LC5.5 gather and assimilate information, with some guidance, and apply it appropriately and then communicate complex technical information succinctly and accurately, by means of presentations, written reports, appropriate diagrams and discussion (KTS, GA);

LC5.6 work on structured group tasks, collaborating in the production of complex practical products and documentation (PPP, GA).

LC5.7 explain knowledge of and demonstrate familiarity with the commercial, economic and social context of engineering, including environmental and sustainability limitations, health and safety and risk-assessment issues as well as management techniques and ethical considerations (KU, GA);

Level 5 learning outcomes – BSc Honours Electronic Engineering Upon completion of Level 5 students will be able to:

LS5.1 use the mathematical principles underpinning the operation of digital and analog electronic circuits and communication systems and demonstrate knowledge of current technology, some of its applications and its design techniques (KU);

LS5.2 design, implement, debug and test, selecting from well-defined methods, analog and digital circuits, programs in high and low-level languages and mathematical models of systems for signal processing and communications (KU, PPP);

LS5.3 analyse, design, assemble and program embedded processors for real-time applications (KU, PPP);

LS5.4 communicate complex technical information succinctly and accurately, by means of presentations, written reports, appropriate diagrams and discussion (GA, KTS);

LS5.5 gather, assimilate, analyse and evaluate technical information, with guidance, and apply it appropriately to managing project work, adhering to prescribed requirements and deadlines (GA, KTS);

LS5.6 collaborate with others effectively in the production of complex practical solutions and documentation within the context of tackling structured group tasks (GA, PPP, KTS);

LS5.7 explain knowledge of and demonstrate familiarity with the commercial, economic and social context of engineering, including environmental and sustainability limitations, health and safety and risk-assessment issues as well as management techniques and ethical considerations (KU, GA).

Level 6 learning outcomes – BSc Honours Biomedical Electronic and Instrumentation Engineering

Upon completion of Level 6 students will be able to:

LB6.1 apply, effectively, knowledge and understanding of biological signals and the underlying theoretical concepts from medical signal processing, together with design methodologies, in the design and implementation of biomedical engineering solutions (KU, GA);

LB6.2 appraise and apply quantitative methods and computer software relevant to the design and construction of electronic and biomedical instrumentation (KU);

LB6.3 apply an awareness of the medical requirements, image processing techniques and simulation tools to the design and development of medical imaging equipment and software (GA, KU, PPP);

LB6.4 evaluate an engineering problem, including customer and user requirements; identify technical constraints; investigate and formulate solutions while managing cost drivers (GA, KU);

LB6.5 develop innovative solutions to the design of medical diagnostic instrumentation, ensuring fitness for purpose and evaluating outcomes objectively (GA, PPP);

LB6.6 deploy engineering skills with fluency, applying practical engineering skills, combining theory and experience, and use of other relevant knowledge and skills including project-management, time-scheduling and ethical considerations (GA, PPP, KTS).

Level 6 learning outcomes – BSc Honours Computer System Engineering Upon completion of Level 6 students will be able to:

LC6.1 gather and assimilate information independently specific to a given engineering problem, choose and formulate cost and effectiveness of a given set of solutions, and then select and implement the most viable solution based on specific constraints, including environmental and sustainability limitations, health and safety and risk-assessment issues (GA, PPP);

LC6.2 critically analyse solutions for the design of real-time and embedded systems to user requirements in the context of industry codes-of-practice, social, environmental and ethical implications (GA, KTS);

LC6.3 apply a strong understanding of the mechanisms and design of modern day operating systems and their relation to contemporary architectures to the selection and configuration of computer systems (KU);

LC6.4 design, develop and interface hardware and provide the necessary software and hardware solutions for a given computer system and be able to critically evaluate the resultant solution in conjunction with published solutions (KU, KTS);

LC6.5 critically assess published material, solutions and to formulate arguments and solutions to problems and then effectively communicate the complex technical information succinctly and accurately, by means of presentations, written reports, appropriate diagrams and discussion (PPP, KTS);

LC6.6 deploy engineering and computing skills with fluency, applying practical engineering skills, combining theory and experience, and use of other relevant knowledge and skills including project-management, time-scheduling and ethical considerations (GA, PPP, KTS).

Level 6 learning outcomes – BSc Honours Electronic Engineering Upon completion of Level 6 students will be able to:

LS6.1 apply, effectively, knowledge and understanding of the scientific and mathematical principles underpinning electronics and communications, together with design methodologies, in the design and implementation of electronic engineering solutions (KU, GA);

LS6.2 evaluate, monitor, interpret and apply the results of analysis and modelling in order to bring about continuous improvement (KU, GA);

LS6.3 appraise and apply quantitative methods and computer software relevant to the engineering of electronic and communication systems (KU);

LS6.4 evaluate an engineering problem, including customer and user requirements; identify technical constraints; investigate and formulate solutions while managing cost drivers (GA);

LS6.5 develop innovative solutions to the design of electronic and communication systems, ensuring fitness for purpose and to evaluating outcomes objectively (GA, PPP);

LS6.6 deploy engineering skills with fluency, applying practical engineering skills, combining theory and experience, and use of other relevant knowledge and skills including project-management, time-scheduling and ethical considerations (GA, PPP, KTS).

How will you learn?

The fundamental principle underlying the learning process and teaching methods used on this course is “learning by doing”. That is, in order to learn and understand the engineering skills and techniques required, students cannot just be told them or read about them - they need to practise them.

This learning-by-doing approach applies to both practical skills, which you will learn through project and laboratory work as well as to analytical skills, which you will learn by applying taught principles to problem-solving tasks often involving the use of advanced software tools for simulation and design.

In order to be effective, we tailor our teaching methods to both the diversity of the subject matter as well as the diversity of students’ optimal learning preferences.

The range of teaching methods you will experience includes such diverse elements as:

- Lecture / seminar sessions
- Projects (group and individual)
- Laboratories and computer-aided engineering
- Problem sheets, investigations and design
- On-line learning Lecturers provide written and verbal feedback on students’ work throughout the course. Feedback may be given individually or to the class collectively.

Some of the specialist mathematics in electronic engineering can be challenging. For this reason, it is often taught within the engineering modules which rely on it. This means that students learn both the purpose and application of the mathematical techniques at the same time as the techniques themselves, making them more obviously relevant and therefore easier to master.

Unlike some programmes offering a wide choice of disparate modules, this course builds on a select number of tightly interrelated themes which have been designed to interleave elegantly.

Knowledge and skills feed across from one topic to another creating a holistic, synoptic learning experience, thereby avoiding the danger of “compartmentalising” ideas.

How will you be assessed?

The modules in comprising this course share a common assessment strategy. As well as checking that students have met the learning outcomes of the module, assessment will, where possible and appropriate, be:

- formative (helping students to learn);
- rigorous (not easily copied or passed without appropriate knowledge and skill);
- challenging (requiring understanding, not just memorising of facts or mathematical tricks);
- workplace relevant (the sort of tasks engineers might be judged on by an employer);
- interesting (relevant to the application of the subject).

Modules may have between one or two aspects of assessment making up the total mark. There are minimum marks for each aspect. This means, for example, that students cannot make up for a very poor exam mark by getting an excellent coursework mark nor can they depend on a good group mark, due to the efforts of other group members, to compensate for a very poor individual mark.

A wide variety of assessment methods are used, including such diverse elements as:

<table>
<tr><th></th><th>Some formative elements of the assessment</th></tr>
<tr><td>• In-class tests</td><td>providing self-appraisal of technical expertise as well as valuable pointers to good exam technique</td></tr>
<tr><td>• Group work</td><td>developing team working skills</td></tr>
<tr><td>• Laboratories</td><td>developing essential practical skills</td></tr>
<tr><td>• Viva-voce examinations</td><td rowspan="3">developing oral and written communication skills</td></tr>
<tr><td>• Written reports</td></tr>
<tr><td>• Presentations and posters</td></tr>
<tr><td>• Computer-based quizzes and exercises</td><td rowspan="3">developing computer-based engineering skills</td></tr>
<tr><td>• Design and implementation of hardware and software</td></tr>
<tr><td>• Analysis, testing and modification of existing hardware or software</td></tr>
<tr><td>• Formal examinations</td><td>summative</td></tr>
</table>

Employment and further study opportunities

University of Westminster graduates will be able to demonstrate the following five Graduate Attributes:

- Critical and creative thinkers
- Literate and effective communicator
- Entrepreneurial
- Global in outlook and engaged in communities
- Social, ethically and environmentally aware

University of Westminster courses capitalise on the benefits that London as a global city and as a major creative, intellectual and technology hub has to offer for the learning environment and experience of our students.

These programmes aim to create graduates who are well prepared for entry into a career in not only the engineering industries but also in any field requiring engineering skills. With an industry-wide shortage, high quality engineering graduates are enjoying a choice of job opportunities with good salaries.

Today's employers are looking for graduates with both good degrees and skills relevant to the workplace, i.e. employability skills. The University of Westminster is committed to developing employable graduates by ensuring that:

- Career development skills are embedded in all courses
- Opportunities for part-time work, placements and work-related learning activities are widely available to students
- Staff continue to widen and strengthen the University's links with employers in all sectors, involving them in curriculum design and encouraging their participation in other aspects of the University's career education and guidance provision

Students on the Department's degree courses have gone on to work for the BBC and BSkyB as well as electronics and technology giants such as BT, Nokia, British Aerospace, Mitsubishi and Philips, and to smaller private companies. Some have gone on to work in the financial district in the City of London while others have started up their own businesses in manufacturing or consultancy. Opportunities also exist for postgraduate study leading to PhD qualifications.

Course structure

This section shows the core and option modules available as part of the course and their credit value. Full-time undergraduate students study 120 credits per year. Course structures can be subject to change each academic year following feedback from a variety of sources.

Note that the first year (Level 4) of BSc Honours Biomedical Electronic and Instrumentation Engineering and BSc Honours Electronic Engineering is common so it is possible to transfer between these programmes at the end of the first year.

Credit Level 4 – BSc Honours Biomedical Electronic and Instrumentation Engineering and BSc Honours Electronic Engineering				
Module code	**Module title**	**Status**	**UK credit**	**ECTS**
4ELEN009W	Applied Signals and Communications	Core	20	10
4ELEN004W	Applied Mathematical Principles	Core	20	10
4ELEN002W	Digital Systems	Core	20	10
4ELEN001W	Analog Electronics	Core	20	10
4ELEN006W	Engineering Programming	Core	20	10
4ELEN007W	Embedded Systems Project	Core	20	10
Award of Certificate of Higher Education available				
Credit Level 4 – BSc Honours Computer System Engineering				
Module code	**Module title**	**Status**	**UK credit**	**ECTS**
4NTCM004W	Programming Methodology I	core	20	10
4NTCM005W	Programming Methodology II	core	20	10
4ELEN010W	Mathematics for Computing	core	20	10
4ELEN002W	Digital Systems	core	20	10
4ELEN003W	Electronics Principles	core	20	10
4ELEN007W	Embedded System Project	core	20	10
Award of Certificate of Higher Education available				
Credit Level 5 – BSc Honours Biomedical Electronic and Instrumentation Engineering				
Module code	**Module title**	**Status**	**UK credit**	**ECTS**
5ELEN011W	Signals and Communication Principles	core	20	10
5ELEN002W	Digital System Design and Implementation	core	20	10
5ELEN008W	Professional Engineering Practice and Industrial Management	core	20	10
5ELEN004W	Robotic Systems Project	core	20	10
5ELEN001W	Analog System Engineering	core	20	10
5ELEN013W	Fundamentals of Biomedical Electronics	core	20	10

Award of Diploma of Higher Education available				
Credit Level 5 – BSc Honours Computer System Engineering				
Module code	**Module title**	**Status**	**UK credit**	**ECTS**
5ELEN008W	Professional Engineering Practice and Industrial Management	core	20	10
5ELEN010W	Sensors, Data acquisition and Interfaces	core	20	10
5ELEN004W	Robotics Systems Project	core	20	10
5ELEN002W	Digital System Design and Implementation	core	20	10
5ELEN006W	Operating Systems and Systems Programming	core	20	10
	Plus **one option module** from:**:**			
5NTCM003W	Network Software Engineering	option	20	10
5ELEN007W	Scripting for Engineering	option	20	10
Award of Diploma of Higher Education available				
Credit Level 5 – BSc Honours Electronic Engineering				
Module code	**Module title**	**Status**	**UK credit**	**ECTS**
5ELEN011W	Signals and Communication Principles	core	20	10
5ELEN002W	Digital System Design and Implementation	core	20	10
5ELEN008W	Professional Engineering Practice and Industrial Management	core	20	10
5ELEN004W	Robotic Systems Project	core	20	10
5ELEN001W	Analog System Engineering	core	20	10
5ELEN005W	Media Systems Fundamentals	core	20	10
Award of Diploma of Higher Education available				

Credit Level P– all BSc programmes				
Module code	**Module title**	**Status**	**UK credit**	**ECTS**
PPPPPPPPW	**Industrial Placement Year**	**Option**	**20**	**10**
Credit Level 6 – BSc Honours Biomedical Electronic and Instrumentation Engineering				
Module code	**Module title**	**Status**	**UK credit**	**ECTS**
6ELEN012W	Individual Project**	core	40	20
6ELEN003W	Advanced Biomedical Electronics	core	20	10
Plus **three option modules** from:				
6ELEN001W	Analog Microelectronics	option	20	10
6ELEN005W	Mobile Communication Systems	option	20	10
6ELEN008W	Embedded and Real-Time System Architectures	option	20	10
6ELEN007W	Digital Signal Processing	option	20	10
Award of BSc available **Award of BSc Honours available.**				
Credit Level 6 – BSc Honours Computer System Engineering				

Module code	Module title	Status	UK credit	ECTS
6ELEN012W	Individual Project**	core	40	20
6ELEN008W	Embedded and Real-Time System Architectures	core	20	10
Plus **three option modules** from:				
6ELEN005W	Mobile Communication System	option	20	10
6ELEN013W	Operating Systems and Drivers	option	20	10
6NTCM001W	Applied Distributed System Programming	option	20	10
6ELEN003W	Advanced Biomedical Electronics	option	20	10
6ELEN011W	Algorithm and System Implementation	option	20	10
Award of BSc available **Award of BSc Honours available.**				
Credit Level 6 – BSc Honours Electronic Engineering				
Module code	**Module title**	**Status**	**UK credit**	**ECTS**
6ELEN012W	Individual Project**	core	40	20
6ELEN007W	Digital Signal Processing	core	20	10
Plus **three option modules** from:				
6ELEN001W	Analog Microelectronics	option	20	10
6ELEN005W	Mobile Communication Systems	option	20	10
6ELEN009W	Applied Media Systems	option	20	10
6ELEN008W	Embedded and Real-Time System Architectures	option	20	10
Award of BSc available **Award of BSc Honours available.**				

Note: not all option modules will necessarily be offered in any one academic year.

****All students are required to undertake the Individual Project in an area that is related to their degree specialisation.**

Professional Body Accreditation and other external references

These programmes are intended to fulfil the educational requirements of the Engineering Council for registration as an Incorporated Engineer (IEng).

The course has been designed with reference to:

The Accreditation of Higher Engineering Programmes UK Standard for Professional Engineering Competence Third edition (AHEP3), Engineering Council, 2014

QAA Subject Benchmark for Engineering Also:

QAA Guidelines for Preparing Programme Specifications

SEEC Credit Level Descriptors for Further and Higher Education

IET Academic Accreditation Information Pack, 2015

IET Guidance on how to meet the Learning Outcome requirements for Accreditation, 2015

Academic regulations

The current Handbook of Academic Regulations is available at westminster.ac.uk/academicregulations

How will you be supported in your studies?

Course Management

This course is managed by staff from the Department of Engineering in the Faculty of Science and Technology. The Course Team consists of lecturers on individual modules, the Head of Department and technical support staff. The day-to-day running of each course is the responsibility of the Course Leader, while the strategic direction of the courses and the allocation of staff is the responsibility of the Head of the Department. The Dean of the Faculty of Science and Technology takes overall responsibility for all departments within it.

Academic Support

Upon arrival, an induction programme will introduce you to the staff responsible for the course, the campus on which you will be studying, the Library and IT facilities, additional support available and to your Faculty Registry Office. You will be provided with the Course Handbook, which provides detailed information about the course. Each course has a course leader or Director of Studies. All students enrolled on a full-time course and part time students registered for more than 60 credits a year have a personal tutor, who provides advice and guidance on academic matters. The University uses a Virtual Learning Environment called Blackboard where students access their course materials, and can communicate and collaborate with staff and other students.

Learning Support

The Academic Learning Development Centre supports students in developing the skills required for higher education. As well as online resources in Blackboard, students have the opportunity to attend Study Skills workshops and one to one appointments.

Learning support includes four libraries, each holding a collection of resources related to the subjects taught at that site. Students[1] can search the entire library collection online through the Library Search service to find and reserve printed books, and access electronic resources (databases, e-journals, e-books). Students can choose to study in the libraries, which have areas for silent and group study, desktop computers, laptops for loan, photocopying and printing services. They can also choose from several computer rooms at each campus where desktop computers are available with the general and specialist software that supports the courses taught in their College. Students can also securely connect their own laptops and mobile devices to the University wireless network.

Support Services

The University of Westminster Student and Academic Services department provide advice and guidance on accommodation, financial and legal matters, personal counselling, health and disability issues, careers, specialist advice for international students and the chaplaincy providing multi-faith guidance. Further information on the advice available to students can be found at westminster.ac.uk/student-advice. The University of Westminster Students' Union also provides a range of facilities to support students during their time at the University. Further information on UWSU can be found at westminster.ac.uk/students-union.

How do we ensure the quality of our courses and continuous improvement?

The course was initially approved by a University Validation Panel in *2015*. The panel included internal peers from the University, academic(s) from another university and a representative from industry. This helps to ensure the comparability of the course to those offered in other universities and the relevance to employers.

The course is also monitored each year by the College to ensure it is running effectively and that issues which might affect the student experience have been appropriately addressed. Staff will consider evidence about the course, including the outcomes from student engagement activities, including School Staff Student Exchange meetings, evidence of student progression and achievement and the reports from external examiners, to evaluate the effectiveness of the course. Each College puts in to place an action plan. This may for example include making changes on the way the module is taught, assessed or even how the course is structured in order to improve the course, in such cases an approval process is in place.

A Course review takes place periodically to ensure that the curriculum is up-to-date and that the skills gained on the course continue to be relevant to employers. Students meet with review panels to provide feedback on their experiences. Student feedback from previous years is also part of the evidence used to assess how the course has been running.

How do we act on student feedback?

Student feedback is important to the University and student views are taken seriously. Student feedback is gathered in a variety of ways.

- Through student engagement activities at Course/Module level, students have the opportunity to express their voice in the running of their course. Student representatives are elected to expressly represent the views of their peers. The University and the Students' Union work together to provide a full induction to the role of the student representatives.

- There are also School Staff Student Exchange meetings that enable wider discussions across the School. Student representatives are also represented on key College and University committees.

- All students are invited to complete a questionnaire before the end of each module. The feedback from this will inform the module leader on the effectiveness of the module and highlight areas that could be enhanced.

- Final year Undergraduate students will be asked to complete the National Student Survey which helps to inform the national university league tables.

Please note: This programme specification provides a concise summary of the main features of the course and the learning outcomes that a student might reasonably be expected to achieve and demonstrate if s/he takes full advantage of the learning opportunities that are provided. This specification should be read in conjunction with the Course Handbook provided to students and Module Handbooks, which provide more detailed information on the specific learning outcomes, content, teaching, learning and assessment methods for each module.