

Course Specification

Published Date:	15-Sep-2020
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Status:	Validated

Core Information

Awarding Body / Institution:	University of Wolverhampton		
School / Institute:	School of Engineering		
Course Code(s):	MA006K23UV	Sandwich	4 Years
UCAS Code:	H666		
Course Title:	BEng (Hons) Electronics and Telecommunications Engineering with Sandwich Placement		
Hierarchy of Awards:	Bachelor of Engineering with Honours Electronics and Telecommunications Engineering with Sandwich Placement Bachelor of Engineering with Honours Electronics and Telecommunications Engineering Bachelor of Engineering Electronics and Telecommunications Engineering with Sandwich Placement Diploma of Higher Education Electronics and Telecommunications Engineering Certificate of Higher Education Engineering University Statement of Credit University Statement of Undergraduate Credit		
Language of Study:	English		
Date of DAG approval:	05/Oct/2015		
Last Review:	2019/0		
Course Specification valid from:	2014/5		
Course Specification valid to:	2024/5		

Academic Staff

Course Leader:	Muhammad Sayed
Head of Department:	Dr Syed Hasan

Course Information

Location of Delivery:	University of Wolverhampton
Category of Partnership:	Not delivered in partnership
Teaching Institution:	University of Wolverhampton
Open / Closed Course:	This course is open to all suitably qualified candidates.

Entry Requirements:

Entry requirements are subject to regular review. The entry requirements applicable to a particular academic year will be published on the University website (and externally as appropriate e.g. UCAS)

2017 Entry

- A Level minimum of BB or CDD to include Maths and either a Technology or Science-based subject.
- BTEC QCF Extended Diploma grade MMP, BTEC QCF Diploma grade DM
- Applicants will normally be expected to hold GCSE English and Maths at grade C+/4 or above (or equivalent)
- If you've got other qualifications or relevant experience, please contact [The Gateway](#) for further advice before applying.
- International entry requirements and application guidance can be found [here](#)
- Successful completion of the [BSc\(Hons\) Science and Engineering with Foundation Year](#) guarantees entry on to this course
- Successful completion of the [International Foundation Year in Science and Engineering](#) guarantees entry on to this course

Other Requirements

Students must have studied a minimum of two years post GCSE level. However, it is expected that some applicants will be mature students with work experience, who wish to further their career development. These applicants will be processed through standard procedures, which may involve an interview as part of the process. Please see <http://wlv.ac.uk/mature> for further information.

Those who do not meet the entry requirements may be offered an alternative course.

Distinctive Features of the Course:

The Department of Engineering and Technology specialises in the integration of the mechanical engineering and electrical/electronic engineering disciplines. The BEng Electronics and Telecommunications Engineering course reflects this emphasis and, in addition to gaining in-depth knowledge and understanding of the core subject, students also gain experience of designing engineering systems that incorporate aspects of the mechanical and electrical/electronic technologies.

You will be using industry-standard software. In addition to experimental work at the University you will use Radar equipment at the Cosford Royal Air Force base - the same equipment used to train Air Force personnel.

You will be taught by lecturers who have a wealth of industrial experience in an environment focused on working with, and supporting engineering and technology companies.

The BEng (Hons) Electronics and Telecommunications Engineering course is one of a small number of accredited courses that you can undertake as either a full-time or part-time (day-release) student, thus providing all graduates with equal recognition.

You will participate in a multi-disciplinary group project, necessitating the application of advanced

management techniques in a progressive technological environment.

A placement can be undertaken anywhere; local, national or even, in some instances, international. During a placement, you will be doing similar work to a normal employee of the organisation giving you a unique insight into your chosen profession or sector, the opportunity to acquire crucial personal skills and also the opportunity to build a network of useful contacts. Many companies that employ graduates use placement programmes as a method of recruitment so you could be fast tracked into employment or onto one of their graduate schemes if you impress them.

The team at [The Workplace](#) constantly search for new placement opportunities but if you find an opportunity that interests you or you have been successful in securing one yourself, contact them for further information and support.

Educational Aims of the Course:

The overall aim of this course is to ensure graduates have a comprehensive engineering education combined with specialist knowledge of electronics and communications engineering recognised in the professional engineering community by an accredited degree. This ensures that graduates are equipped with the appropriate knowledge and enterprising spirit to practise professionally and ethically. Thus, the course will:

- address industry's demand for graduates who can integrate the principles and applications of electronics and telecommunications engineering, and apply them to the analysis and synthesis of engineering products and systems across the engineering sector
- enable students to pursue professional careers in the electronics or telecommunications engineering field at a level which requires the exercise of sound judgement, and initiative, and the ability to make informed decisions in complex and unpredictable circumstances that reflect a responsible, ethical, and socially aware outlook
- furnish students with a detailed understanding of the principles of electrical engineering, electronics, telecommunications and mechanical engineering science, enabling the rational selection of the most appropriate approach to solve engineering problems
- engender a top-down, systems approach to the analysis, synthesis and realisation of electronic and telecommunications products and systems.
- provide a broadly based education in electrical engineering, electronics, communications engineering and design allowing scope for entry into a wide range of disciplines within the engineering field.
- require students to participate in a group project where the project team members are drawn from a range of cognate engineering disciplines
- develop the ability to research unfamiliar subject areas in electronics and telecommunications engineering and cognate disciplines, thereby enhancing the creative aspects of engineering design and innovation

Intakes:

September

Major Source of Funding:

Office for Students (OFS)

Tuition Fees:

Tuition fees are reviewed on an annual basis. The fees applicable to a particular academic year will be published on the University website.

Year	Status	Mode	Amount
2020/1	H	Full Time / Sandwich	£9250.00
2020/1	Overseas	Full Time / Sandwich	£12250.00

PSRB:

MA006K23UV (Sandwich)

Professional Accreditation Body:
Institution of Engineering and Technology (IET)

Accrediting Body:
Institution of Engineering and Technology (IET)

Accreditation Statement:

Accredited by the Institution of Engineering and Technology (IET) on behalf of the Engineering Council for the purposes of fully meeting the academic requirement for registration as an Incorporated Engineer and partially meeting the academic requirement for registration as a Chartered Engineer.

Approved	Start	Expected End	Renewal
26/Apr/2019	01/Sep/2015	31/Aug/2022	31/Aug/2022

Course Structure:

September (Sandwich)

Part time students study alongside full time students. However, they do not study more than 80 credits in each academic calendar year.

Year 1

Module	Title	Credits	Period	Type
4MA007	Engineering Mathematics	20	SEM1	Core
4MA008	Engineering Science	20	SEM1	Core
4MA009	Computer Aided Design	20	SEM2	Core
4MA022	Information Systems	20	SEM2	Core
4MA028	Engineering Experimentation	20	YEAR	Core
4MA029	Industrial Design Project	20	YEAR	Core

September (Sandwich)

Part time students study alongside full time students. However, they do not study more than 80 credits in each academic calendar year.

Year 2

Module	Title	Credits	Period	Type
5MA041	Signal Processing	20	SEM2	Core
5MA044	Applied Instrumentation and Control	20	SEM1	Core
5MA043	Analogue and Digital Telecommunications	20	SEM2	Core
5MA038	Enterprising Group Innovation Project	40	YEAR	Core
5MA042	Digital Systems and Embedded Computing	20	SEM1	Core

September (Sandwich)

Part time students study alongside full time students. However, they do not study more than 80 credits in each academic calendar year.

Year 3

Module	Title	Credits	Period	Type
5MA016	Industrial Placement	40	CRYRA	Core

September (Sandwich)

Part time students study alongside full time students. However, they do not study more than 80 credits in each academic calendar year.

Year 4

Module	Title	Credits	Period	Type
6MA036	ESEE - Economic, Social, Ethical and Environmental	20	SEM2	Core
6MA046	Microwaves and RF Circuits	20	SEM2	Core
6MA047	Communications System Design	20	SEM1	Core
6MA050	Power Electronics and Electric Machines	20	SEM1	Core
6MA038	Individual Innovation Project	40	YEAR	Core

Please note: Optional modules might not run every year, the course team will decide on an annual basis which options will be running, based on student demand and academic factors, to create the best learning experience.

Learning, Teaching and Assessment

Academic Regulations Exemption:

In situations where Professional Body and University regulations differ, the respective Professional Body (IET) regulation will have precedent over the exempted University regulation;

Section 1.2.5 - Exemption to permit less than 33% differentiation (mainly at Level 4 and Level 5) between the majority of named undergraduate Engineering degree programmes.

Section 4.4.1 - Exemption in accordance with Institution of Engineering and Technology (IET) requirements. Compensation will be limited to no more than 20 credits at each level of study and maximum of 40 credits overall. There is no compensation permitted for independent study or postgraduate modules. Deferral of a project submission date at Level 6 or Level 7 is allowed only for exceptional reasons and for a maximum of three months.

APPROVED (by Chair's Action on 11/7/2019).

Section 5.2.2 - Exemption to use all Level 5 and Level 6 module grades excluding placement modules (assessed using a Pass/Fail marking scheme) to contribute towards overall BEng classifications with aggregated weightings at each level of study as follows;

Level	Weighting
4	-
5	25%
6	75%

These above weightings also apply to any students studying less than 120 credits at Level 5.

For students being admitted directly at Level 6, on degrees which do not have professional accreditation, student degree classifications are based upon the average of their highest module grades achieved over 100 credits at Level 6 according to weightings listed below as follows;

Level	Weighting
4	-
5	-
6	100%

For accredited programmes, the PSRB will assess the educational qualifications of an applicant for either IEng or CEng status based upon the receipt of a certified transcript from the University Registry (and with the applicant's authorisation).

APPROVED on 17/5/2018.

Reference Points:

The following PSRB and QAA subject benchmarks have been consulted in the development of learning outcomes of this course, thereby ensuring that the academic requirements of the appropriate PSRBs (Institution of Engineering and Technology (IET)) are addressed:

- Engineering Council UK-SPEC 2015
- Framework for Higher Education Qualifications (FHEQ) - descriptors for a qualification at Honours (H) level and at Masters (M) level:

The School of Engineering and the Built Environment publication "Equality and Diversity in the Curriculum" has been used to inform the design of the teaching and learning materials and the assessment regime.

Learning Outcomes:

CertHE Course Learning Outcome 1 (CHECLO1)

Demonstrate knowledge of the underlying concepts and principles associated with your area(s) of study, and an ability to evaluate and interpret these within the context of that area of study

CertHE Course Learning Outcome 2 (CHECLO2)

Demonstrate an ability to present, evaluate and interpret qualitative and quantitative data, in order to develop lines of argument and make sound judgements in accordance with basic theories and concepts of your subject(s) of study.

CertHE Course Learning Outcome 3 (CHECLO3)

Evaluate the appropriateness of different approaches to solving problems related to your area(s) of study and/or work

CertHE Course Learning Outcome 4 (CHECLO4)

Communicate the results of your study/work accurately and reliably, and with structured and coherent arguments

CertHE Course Learning Outcome 5 (CHECLO5)

Demonstrate the qualities and transferable skills necessary for employment requiring the exercise of some personal responsibility

DipHE Course Learning Outcome 1 (DHE#CLO1)

Demonstrate knowledge and critical understanding of the well-established principles of your area(s) of study, and of the way in which those principles have developed with an understanding of the limits of your knowledge, and how this influences analyses and interpretations based on that knowledge.

DipHE Course Learning Outcome 2 (DHE#CLO2)

Demonstrate the ability to apply underlying concepts and principles outside the context in which they were first studied, including, where appropriate, the application of those principles in an employment context

DipHE Course Learning Outcome 3 (DHE#CLO3)

Demonstrate knowledge of the main methods of enquiry in the subject(s) relevant to the named award, and ability to evaluate critically the appropriateness of different approaches to solving problems in the field of study

DipHE Course Learning Outcome 4 (DHE#CLO4)

Use a range of established techniques to initiate and undertake critical analysis of information, and to propose solutions to problems arising from that analysis

DipHE Course Learning Outcome 5 (DHE#CLO5)

Effectively communicate information, arguments and analysis in a variety of forms to specialist and non-specialist audiences, and deploy key techniques of the discipline effectively

DipHE Course Learning Outcome 6 (DHE#CLO6)

Demonstrate the qualities and transferable skills necessary for employment, requiring the exercise of personal responsibility and decision-making and undertake further training, developing existing skills and acquire new competences that will enable them to assume significant responsibility within organisations

Ordinary Degree Course Learning Outcome 1 (ORD#CLO1)

Design, analyse and synthesise electronics and telecommunications engineering products, systems, and processes to demonstrate an innovative and creative approach to design realisation.

Ordinary Degree Course Learning Outcome 2 (ORD#CLO2)

Analyse and evaluate a range of solutions to Electronics and Telecommunications problems, drawn from a broad-based multidisciplinary engineering and technology specialities with an ability to adapt theories or methods to solve unfamiliar problems.

Ordinary Degree Course Learning Outcome 3 (ORD#CLO3)

Select and apply appropriate mathematical and scientific methods to solve problems in the analysis and synthesis of Electronics and Telecommunications products and systems.

Ordinary Degree Course Learning Outcome 4 (ORD#CLO4)

Contribute to teamwork effectively and ethically, addressing the prominent Electronics and Telecommunications concepts, considering also the wider aspects of social, environmental, ethical, commercial, legal, and enterprise issues through the effective management, communication, policy integration, standard-compliance, planning and self-learning.

Ordinary Degree Course Learning Outcome 5 (ORD#CLO5)

Select and apply appropriate software packages along with relevant professional codes for design, analysis, and synthesis of Electronics and Telecommunications systems to critically reflect and communicate the results with appropriate levels of detail.

Ordinary Degree Course Learning Outcome 6 (ORD#CLO6)

Relate theory and practice to the recognition of processes and products thereby facilitating the efficient realisation of viable electronics and telecommunications engineering products, systems and processes.

Honours Degree Course Learning Outcome 1 (DEG#CLO1)

Design, analyse and synthesise electronics and telecommunications engineering products, systems, and processes to demonstrate an innovative and creative approach to design realisation.

Honours Degree Course Learning Outcome 2 (DEG#CLO2)

Analyse and evaluate a range of solutions to Electronics and Telecommunications problems, drawn from a broad-based multidisciplinary engineering and technology specialities with an ability to adapt theories or methods to solve unfamiliar problems.

Honours Degree Course Learning Outcome 3 (DEG#CLO3)

Select and apply appropriate mathematical and scientific methods to solve problems in the analysis and synthesis of Electronics and Telecommunications products and systems.

Honours Degree Course Learning Outcome 4 (DEG#CLO4)

Contribute to teamwork effectively and ethically, addressing the prominent Electronics and Telecommunications concepts, considering also the wider aspects of social, environmental, ethical, commercial, legal, and enterprise issues through the effective management, communication, policy integration, standard-compliance, planning and self-learning.

Honours Degree Course Learning Outcome 5 (DEG#CLO5)

Select and apply appropriate software packages along with relevant professional codes for design, analysis,

and synthesis of Electronics and Telecommunications systems to critically reflect and communicate the results with appropriate levels of detail.

Honours Degree Course Learning Outcome 6 (DEG#CLO6)

Relate theory and practice to the recognition of processes and products thereby facilitating the efficient realisation of viable electronics and telecommunications engineering products, systems and processes.

Honours Degree Course Learning Outcome 7 (DEG#CLO7)

Validate, manage and implement a research study in your discipline and effectively disseminate the findings that arise.

Overview of Assessment:

Module	Title	Course Learning Outcomes
4MA007	Engineering Mathematics	CHECLO2, CHECLO3, CHECLO5
4MA008	Engineering Science	CHECLO2, CHECLO3
4MA009	Computer Aided Design	CHECLO1, CHECLO4, CHECLO5
4MA022	Information Systems	CHECLO1, CHECLO2, CHECLO3
4MA028	Engineering Experimentation	CHECLO2, CHECLO5
4MA029	Industrial Design Project	CHECLO1, CHECLO2, CHECLO3, CHECLO4, CHECLO5
5MA016	Industrial Placement	DHE#CLO1, DHE#CLO2, DHE#CLO3, DHE#CLO4, DHE#CLO5, DHE#CLO6
5MA038	Enterprising Group Innovation Project	DHE#CLO1, DHE#CLO2, DHE#CLO3, DHE#CLO4, DHE#CLO5, DHE#CLO6
5MA041	Signal Processing	DHE#CLO1, DHE#CLO2, DHE#CLO3, DHE#CLO6
5MA042	Digital Systems and Embedded Computing	DHE#CLO1, DHE#CLO2, DHE#CLO3, DHE#CLO6
5MA043	Analogue and Digital Telecommunications	DHE#CLO1, DHE#CLO2, DHE#CLO3, DHE#CLO6
5MA044	Applied Instrumentation and Control	DHE#CLO2, DHE#CLO3
6MA036	ESEE - Economic, Social, Ethical and Environmental	DEG#CLO4, DEG#CLO6, ORD#CLO4, ORD#CLO6
6MA038	Individual Innovation Project	DEG#CLO1, DEG#CLO2, DEG#CLO3, DEG#CLO4, DEG#CLO5, DEG#CLO6, DEG#CLO7, ORD#CLO1, ORD#CLO2, ORD#CLO3, ORD#CLO4, ORD#CLO5, ORD#CLO6
6MA046	Microwaves and RF Circuits	DEG#CLO1, DEG#CLO2, DEG#CLO3, DEG#CLO6, ORD#CLO1, ORD#CLO2, ORD#CLO3, ORD#CLO6
6MA047	Communications System Design	DEG#CLO1, DEG#CLO2, DEG#CLO3, DEG#CLO5, ORD#CLO1, ORD#CLO2, ORD#CLO3, ORD#CLO5
6MA050	Power Electronics and Electric Machines	DEG#CLO1, DEG#CLO2, DEG#CLO3, DEG#CLO5, DEG#CLO6, ORD#CLO1, ORD#CLO2, ORD#CLO3, ORD#CLO5, ORD#CLO6

Teaching, Learning and Assessment:

The following learning activities support the achievement of the course learning outcomes:

1. Reading – core and supplementary texts, journals and electronic sources
2. Group activities aimed at developing team-working skills in a multi-disciplinary environment
3. Preparing written presentations; both analytically and textually based
4. Oral presentations; both group and individual
5. Lectures and laboratory sessions
6. Group and individual tutorials
7. Engaging in informed discussion with fellow students and academic staff in tutorials and seminars
8. Information retrieval from articles, journals and books for assessments
9. Problem-based learning techniques, e.g. design projects, case studies
10. Providing solutions to meet real world problems/requirements
11. Solving closed and open ended problems
12. Using computer software and hardware to model and simulate products and engineering systems
13. Engaging in informed discussion with fellow students and academic staff in tutorials
14. Student led presentations
15. Researching articles, journals and books for assessments
16. Applying systematic methods to develop (novel) solutions
17. Coursework reports (technical and discursive)
18. Preparing for unseen examinations
19. Writing Project dissertation
20. Critical examination of data
21. Working within accepted guidelines
22. Simulation and problem solving exercises.

Assessment Methods:

At the University of Wolverhampton, a variety of modes of assessment will be used to support and test your learning and progress and to help you develop capabilities that are valued beyond your University studies and into your working life. Your course may include a variety of assessment activities:

Written examinations (including online examinations, open and closed book examinations and quizzes)
Coursework (for example, essays, reports, portfolios, project proposals and briefs, CVs, poster presentation)
Practical (for example, oral and video presentations, laboratory work, performances, practical skills assessment)

In the final year of your undergraduate degree, and at the end of your postgraduate degree, you are likely to be expected to write an extended piece of work or research, such as a dissertation or a practice-based piece of research.

Student Support:

Enhanced learning support is provided in the following areas:

1. Support for mathematics and analytic-based modules via the Mathletics software package
2. Face-to-face tutorial sessions in mathematics
3. Report writing and oral/presentation communications skills
4. Learning centre – literature searches and information searches
5. Practical/lab/experimental activities and reporting
6. Research for project work (major individual, group at M-level, plus group assignments at L5/6)
7. Promotion of *independent learning* during tutorials, face-to-face sessions.

University provided support:

As well as providing general counselling support the University Counselling Service provides short courses

on topics such as "Self Confidence", "Stress Management and Relaxation" and "Life Skills". They also provide study skills and academic support, providing short courses such as provide help in areas such as "Writing and Assignment Skills", "Exam Techniques", "Enhancing Professional Skills", "Personal Development Planning" and "Making Choices for the Future."

In addition to the subject knowledge that you will gain from studying on your course, there are opportunities available to develop a range of skills that will help with your academic work; such academic skills include giving presentations, group work, academic writing, referencing and time management.

The Learning and Skills Team in Learning and Information Services (LIS) offer year-round academic skills support and guidance to all students. Students who are new to academic study and unsure of how to get started, or any student who wants to improve on their academic performance can attend drop-in sessions and workshops, or obtain advice via email or Skype. More details about how the Learning and Skills Team can help you are available at; <http://www.wlv.ac.uk/skills>

Employability in the Curriculum:

The field of information systems, supported by electronics and communications, is extensive and services a rapidly expanding market. Graduates from this course will find many opportunities for well-paid jobs such as designing communication networks, managing networks, or developing novel electronic systems. The multidisciplinary nature of the electronics and telecommunications engineering subject area provides career opportunities in a broad spectrum of industries, from consumer goods design and manufacture to large process control plants, and of course the telecommunications sector. The course enables graduates to attain management positions, with significant levels of responsibility within a relatively short time. Graduates may also study for a taught postgraduate degree, MSc, or a research degree, MPhil/PhD, within the Department.

The transferable skills gained during the course, including: project management, group working, and analytical thinking, also enable a graduate to pursue careers in nontechnical fields such as: law, accountancy, authoring, and computing.

The completion of a Sandwich Year will enable you to gain valuable hands on experience in a relevant work environment. This will not only provide additional practical subject skills but it will also develop personal transferable skills such as communication skills, problem solving skills and demonstrate competency in working with other people. This will increase your employability and assist you in gaining employment in the future.

