UNIVERSITY OF BRADFORD  
Faculty of Engineering and Informatics  
School of Electrical Engineering and Computer Science  
Programme titles:  
MEng Honours in Electronic, Telecommunications & Internet Engineering (5-year)  
MEng Honours in Electronic, Telecommunications & Internet Engineering

<table>
<thead>
<tr>
<th>Awarding and teaching institution:</th>
<th>University of Bradford</th>
</tr>
</thead>
<tbody>
<tr>
<td>Final and interim award:</td>
<td>MEng</td>
</tr>
<tr>
<td></td>
<td>[Framework for Higher Education Qualifications level 7]</td>
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<td>BEng (Honours)</td>
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<td></td>
<td>BEng (Ordinary)</td>
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<td>Programme title:</td>
<td>MEng Honours in Electronic, Telecommunications &amp; Internet Engineering (5-year),</td>
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<td>MEng Honours in Electronic, Telecommunications &amp; Internet Engineering</td>
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<tr>
<td>Programme accredited by:</td>
<td>Institution of Engineering &amp; Technology (IET)</td>
</tr>
<tr>
<td>Duration:</td>
<td>MEng 4 years (5 years with Industrial Studies or Study Abroad)</td>
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<td>UCAS code:</td>
<td>ETIE - H695 (full time); H690 (sandwich)</td>
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<td>Subject benchmark statement(s):</td>
<td>UK-SPEC</td>
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<tr>
<td>Date produced:</td>
<td>10th March 2014</td>
</tr>
<tr>
<td>Last updated:</td>
<td>June 2014</td>
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**Introduction**

Engineering is fundamental to economic and social prosperity, applying scientific principles creatively, to solve practical problems. It is responsible for the creation of all material objects and systems necessary for modern living from concept, to customer, to decommissioning. A profession that serves the needs of humanity, it
develops and manages our environment in an ethical and sustainable manner, and
improves our way of life. Electrical and electronic engineering is the practical,
creative and innovative application of electrical science and technology to the
solution of problems, the design, development and improvement of products and
processes in industry, commerce and society. This exciting and rapidly developing
field will continue to drive the technological revolution of the 21st century. From a
heart monitor to a power station; from satellite systems to the semiconductor chips
and applications in your smartphone, electrical and electronic engineers provide the
products, skills, services and above all, ingenuity and innovation, upon which
modern life depends.

MEng degrees differ from BEng degrees in having a greater range of project work
particularly an interdisciplinary group project in the final year. They also provide a
greater range and depth of specialist knowledge, within a research and industrial
context, as well as broader and more general educational base, to provide both a
foundation for leadership, and a wider appreciation of the economic, social, ethical
and environmental context of engineering. Your studies at Bradford will be a
foundation for life, developing a deep understanding of fundamental and advanced
technical principles, analytical tools, and competence in their application together
with a wide range of management, leadership, personal and professional skills. An
excellent way to develop these skills is to undertake an industrial placement as an
integral part of your degree studies.

Upon graduation, you will have the capacity for meaningful interdisciplinary
interaction, leadership roles, and professional growth, which may include seeking
Chartered Engineer (CEng) registration. Our MEng programmes were originated in
collaboration with the electronics industry and employers appreciate the rich
potential of MEng graduates for innovation and leadership. The ability of an engineer
to think clearly and logically is widely appreciated by many other professions and
your studies could also provide a stepping-stone to alternative careers in financial
services, teaching, law, etc – a real foundation for life. Our courses combine the vital
theoretical backbone with the creative, practical and personal skills needed for a
career as a professional engineer.

The programmes are accredited by the Institution of Engineering and Technology
(IET) as providing the full academic requirement for a Chartered Engineer and this
ensures that the MEng degree meets the highest national and international
standards and is recognised in many countries across the world.

Our MEng courses have common early years with the equivalent BEng degree
courses. However, the standards expected of MEng students are higher and this is
reflected in the more demanding progression requirements at each stage. It is thus
expected that MEng students will be developing both a deeper and a broader
understanding of their engineering discipline. The two MEng programmes
described here have identical academic content at Stage 1, 2, 3 and 4. However,
the 5-year programme incorporates a one-year placement in industry or year of
studies abroad between Stage 2 and 3.

Electronic, Telecommunications and Internet Engineering (ETIE)
Electronic engineering has undergone a technological explosion in the last few decades. The evolution of computers, networks and digital systems (particularly microprocessors) has already affected the working lives of most people. The revolution in global mass communications is beginning to have an even more far-reaching impact on their daily lives, and this will increase through the 21st century. For engineers with ingenious and inquisitive minds and the right combination of skills, opportunities for fascinating and lucrative careers throughout the world are extensive and growing rapidly.

This course has been designed to provide these skills. Although it still provides a strong foundation in all aspects of electronics, it is particularly focussed on employment in the area of telecommunication and internet engineering. It is structured to allow new developments to be introduced, as they become valuable career attributes.

A core of electronics modules provides a basic understanding of electronic systems. You then build up a portfolio of computer programming, software engineering, telecommunications, control, and systems engineering topics necessary for an understanding of modern complex networks and real-time systems. You become as expert in your understanding of programmable devices and computer networks as in the more traditional areas of electrical engineering. Many graduates from this course find careers in the communications industry, which is increasingly dominated by software systems and techniques.

At Stage 4 (Masters Level) you will engage with an interdisciplinary group project, develop advanced computation and design optimisation skills, and select from a range of advanced subject and skills options that provide both technical depth and breadth.

Year in Industry or study abroad

The programme can be taken in 4-years, or in a 5-year “thick sandwich” variant, the latter including a one-year placement in industry, period of study abroad or combination of these. This typically is taken following Stage 2. It would be your responsibility to apply for and secure a placement or opportunity for study abroad. However, the School provides a range of support from refining your CV and applications letters to advertising to students a wide range of placement opportunities and is a member of the ERASMUS programme supporting study abroad. A placement or period of study abroad is strongly recommended as an opportunity to enhance your confidence and experience and strengthen your CV. There is good evidence that students who have a placement find professional jobs ahead of others. Often job offers and industrially relevant Stage 3 projects flow directly from the placement.

Relationship to BEng Programmes.

Both MEng courses have common early years with the equivalent BEng degree courses. However, as an MEng student, you are required to achieve more demanding progression requirements at each stage. You also have an additional year of study at masters level. Students progressing successfully from Stage 3 of the Programme will typically have at least met the requirements for a lower second class
BEng degree, which provides a fall-back award if they wish to exit at this stage (for example to transfer to an MSc programme) or should they fail to meet the requirements for the MEng award.

Programme Aims

The MEng Electronic, Telecommunications and Internet Engineering is intended to:

- Provide a basis for a successful professional career in the area of electronic engineering, telecommunications and internet engineering, leading to positions of technical and commercial leadership.
- Provide the full educational requirements (in compliance with UK-SPEC) to permit progression to chartered membership of the IET and registration with ECUK as a chartered engineer.
- Provide a challenging course in terms of technical breadth and depth as well as supporting managerial and transferable skills in keeping the ECUK UK-SPEC requirements of an accredited MEng course.

Additionally, the 5-year Programme is intended to provide you with an opportunity to:

- Apply knowledge and skills gained in their academic study programme to meet the real-world demands of the workplace, developing and acquiring new skills and practical experience related to the needs of the employing organisation;
- Develop confidence in communicating clearly and effectively and in working cooperatively with others
- Experience taking personal responsibility for managing, planning and timely delivery of a task to meet specified requirements;
- Increase a your motivation and employability.

Or alternatively to

- Extend knowledge and skills through a period of study abroad;
- Broaden your experience and develop confidence, independence and cultural awareness;
- Encourage international links and mobility and increase your motivation and employability.

Programme Learning Outcomes

When you have completed the programme, you will develop the following:

General Learning Outcomes

1 Knowledge and Understanding
knowledge and understanding of essential facts, concepts, theories and principles of electronics and telecommunications engineering and its underpinning science and mathematics; an appreciation of the wider multidisciplinary engineering context and its underlying principles and an appreciation of the social, environmental, ethical, economic and commercial considerations affecting the exercise of your engineering judgment;

2 Intellectual Abilities
ability to apply appropriate quantitative science and engineering tools to the analysis of problems; ability to demonstrate creativity and innovation in the synthesis of solutions and in formulating designs; ability to comprehend the broad picture and thus work with an appropriate level of detail.

3 Practical Skills
practical engineering skills acquired through work carried out in laboratories and workshops; in industry through supervised work experience; in individual and group project work; in design work; and in the development and use of computer software in design, analysis and control; experience of group working and of participation in a major project.

4 General Transferable Skills
problem solving, communication, and working with others, effective use of IT facilities and information retrieval skills; planning self-learning and improving performance, as the foundation for lifelong learning/CPD.

Specific Learning Outcomes in Engineering
Intended Learning Outcomes for the award and for exit awards at each stage of the programme are shown below.

Intended Learning Outcomes for the MEng Award

<table>
<thead>
<tr>
<th>Level 7 ILOs</th>
<th>You will be able to…</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ILO1: Underpinning Science and Mathematics</strong></td>
<td>demonstrate mastery in application of the underpinning science, principles, methodology and mathematical, tools and techniques required in the electronics and telecommunications engineering field</td>
</tr>
<tr>
<td><strong>ILO2: Engineering Analysis</strong></td>
<td>demonstrate mastery in their ability to identify, classify, describe, model and analyse the performance of complex current and emerging the electronics and telecommunications engineering systems and subsystems</td>
</tr>
<tr>
<td><strong>ILO3: Design</strong></td>
<td>research and define a complex, advanced or interdisciplinary problem and its constraints, develop specifications and select credible methodology for state of art, practical implementation and evaluation of innovative, sustainable solutions</td>
</tr>
<tr>
<td><strong>ILO4: Economic and social context and professional skills</strong></td>
<td>communicate complex ideas clearly and succinctly in a range of contexts and integrate innovation, enterprise and commercial, social, ethical and sustainability constraints into electronics and telecommunications systems design</td>
</tr>
</tbody>
</table>
ILO5: Engineering Practice integrate theory, experience and commercial constraints to select suitable methods and materials, develop, prototype, model, simulate, manufacture, test and evaluate the electronics and telecommunications engineering systems to current and emerging industry standards

Intended Learning Outcomes for the BEng Exit Award

Level 6 ILOs You will be able to…

ILO1: Underpinning Science and Mathematics critically review, consolidate and extend knowledge and understanding of underpinning science, principles, methodology and mathematical techniques required in the electronics and telecommunications engineering field

ILO2: Engineering Analysis critically apply and extend engineering principles and ideas to identify, classify, describe, model and analyse the performance of a wide range of complex electronics and telecommunications signals, circuits and systems

ILO3: Design investigate and define a specialised problem and its constraints, research and develop specifications identify options and select credible methods for practical implementation and evaluation of sustainable solutions

ILO4: Economic and social context and professional skills communicate complex ideas clearly and succinctly in a range of contexts and integrate innovation, enterprise and commercial, social, ethical and sustainability constraints into electrical systems design

ILO5: Engineering Practice integrate theory and experience to select suitable methods and materials, develop, prototype, model, simulate, manufacture, test and evaluate electronics and telecommunications engineering systems to industry standards

Intended Learning Outcomes for the Dip H.E. Exit Award

Level 5 ILOs You will be able to…

ILO1: Underpinning Science and Mathematics demonstrate rigour in the acquisition of a broad and deep knowledge and understanding of the underpinning science and mathematics required for electronics and telecommunications field

ILO2: Engineering Analysis apply fundamental engineering principles and abstract ideas to identify, classify, describe, model and analyse the performance of a wide range of electronics and telecommunications signals, circuits and systems
ILO3: Design  develop and evaluate creative solutions to well-defined problems, applying wide ranging specialist techniques with an appreciation of the commercial context, industry standards, sustainability and ethical implications

ILO4: Economic and social context and professional skills  communicate clearly, collaborate effectively, show independent organisation, and understanding of financial management and the commercial, social, ethical and sustainability context of engineering

ILO5: Engineering Practice  select suitable methods and materials, work safely and sustainably, prototype, model, simulate, manufacture, test, evaluate and document, electronics and telecommunications systems to industry standards

Intended Learning Outcomes for the Certificate of H.E. Exit Award

Level 4 ILOs  You will be able to…

ILO1: Underpinning Science and Mathematics  demonstrate a rigorous and systematic approach to the acquisition of a broad foundation in the underpinning science and mathematics required for electronics and telecommunications engineering

ILO2: Engineering Analysis  systematically and rigorously apply fundamental engineering principles to identify, classify, describe, model and analyse the performance of electronics and telecommunications signals, circuits and systems

ILO3: Design  integrate knowledge and analytical skills to identify and specify solutions to unpredictable but well-defined problems with an appreciation of industry-standard design techniques and approaches

ILO4: Economic and social context and professional skills  demonstrate personal, study, IT, reflection, organisation, oral and written reporting and presentation skills and an awareness of the social, ethical and sustainability context of engineering

ILO5: Engineering Practice  prototype, manufacture, test and document electronics and telecommunications systems using industry standard techniques with an awareness of health and safety and of full product lifecycle issues

Ordinary Award

Although the University does not recruit directly to Ordinary degrees this route is available to students for whom a less intense programme of study is appropriate. A Bachelor’s degree (Ordinary) may be awarded to you if you have demonstrated:

- a systematic understanding key aspects of their field of study, including acquisition of coherent and detailed knowledge informed by aspects of Electronics and Telecommunications Engineering.
• an ability to deploy accurately established techniques of analysis and enquiry within Electronics and Telecommunications Engineering.
• conceptual understanding that enables you:
  o to devise and sustain arguments, and/or to solve problems, using ideas and techniques.
  o to describe and comment upon particular aspects of current research, or equivalent scholarship, or practice in computer animation.
• an appreciation of the uncertainty, ambiguity and limits of knowledge.
• the ability to manage their own learning, and to make use of primary sources.

Typically, holders of the qualification will be able to:
• apply the methods and techniques that you have learned to review, consolidate, extend and apply their knowledge and understanding.
• communicate information, ideas, problems and solutions to both specialist and non-specialist audiences.

And you will have:
• the qualities and transferable skills necessary for employment requiring:
  o the exercise of initiative and personal responsibility
  o the learning ability needed to undertake appropriate further training of a professional or equivalent nature.
Curriculum
C core  O option, default pathway shown underlined

Stage 1 (2014-15)

<table>
<thead>
<tr>
<th>Code</th>
<th>Module Title</th>
<th>ETIE type</th>
<th>Credit</th>
<th>FHEQ Level</th>
<th>Study Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENG1312L</td>
<td>Engineering Analysis</td>
<td>C</td>
<td>10+10</td>
<td>4</td>
<td>1, 2</td>
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<tr>
<td>CM-0137L</td>
<td>Developing Professional Skills (Electrical)</td>
<td>C</td>
<td>10+10</td>
<td>4</td>
<td>1, 2</td>
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<tr>
<td>CM-0136L</td>
<td>Electrical Engineering Fundamentals</td>
<td>C</td>
<td>10+10</td>
<td>4</td>
<td>1, 2</td>
</tr>
<tr>
<td>CM-0133L</td>
<td>Digital and Analogue Electronics</td>
<td>C</td>
<td>10+10</td>
<td>4</td>
<td>1, 2</td>
</tr>
<tr>
<td>CM-0134D</td>
<td>Practical Electronics</td>
<td>C</td>
<td>20</td>
<td>4</td>
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<tr>
<td>CM-0135D</td>
<td>C Programming with Robots</td>
<td>C</td>
<td>20</td>
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Stage 2 (2015-16 onwards)

<table>
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<tr>
<th>Code</th>
<th>Module Title</th>
<th>ETIE type</th>
<th>Ord type</th>
<th>Credit</th>
<th>FHEQ Level</th>
<th>Study Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>SOE23xxxL</td>
<td>Further Engineering Analysis &amp; Statistics</td>
<td>C</td>
<td>C</td>
<td>10+10</td>
<td>5</td>
<td>1, 2</td>
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<tr>
<td>SOE23xxxL</td>
<td>Financial &amp; Project Management</td>
<td>C</td>
<td>C</td>
<td>10+10</td>
<td>5</td>
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<tr>
<td>CM-0230D</td>
<td>Digital Systems Design</td>
<td>C</td>
<td>C</td>
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<tr>
<td>CM-0231D</td>
<td>Analogue Electronics &amp; Electrical Systems</td>
<td>C</td>
<td>C</td>
<td>20</td>
<td>5</td>
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<tr>
<td>CM-0232D</td>
<td>System Design Project Group</td>
<td>C</td>
<td>C</td>
<td>20</td>
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<tr>
<td>CM-0233D</td>
<td>Telecommunications Engineering</td>
<td>C</td>
<td></td>
<td>20</td>
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BEng/MEng students study 60 credits per semester; Ordinary Programme 50 credits per semester.

Stage 3 (2015-16 onwards)

<table>
<thead>
<tr>
<th>Code</th>
<th>Module Title</th>
<th>ETIE</th>
<th>Ord</th>
<th>Credit</th>
<th>Level</th>
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<tr>
<td>CM-0347K</td>
<td>Final Year Project</td>
<td>C</td>
<td>C</td>
<td>20+20</td>
<td>6</td>
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<tr>
<td>CM-0429D</td>
<td>Signal Processing</td>
<td>C</td>
<td>O</td>
<td>20</td>
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<tr>
<td>CM-0437D</td>
<td>Mobile and Satellite Communications</td>
<td>C</td>
<td>O</td>
<td>20</td>
<td>6</td>
<td>1</td>
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<tr>
<td>CM-0360D</td>
<td>Automation &amp; Control</td>
<td>O</td>
<td>O</td>
<td>20</td>
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<tr>
<td></td>
<td>Semester 1 Elective*</td>
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<td>6</td>
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<tr>
<td>CM-0361D</td>
<td>Advanced Electronic Systems Design</td>
<td>O</td>
<td>O</td>
<td>20</td>
<td>6</td>
<td>2</td>
</tr>
<tr>
<td>CM-0362D</td>
<td>Radio Systems Design</td>
<td>O</td>
<td>O</td>
<td>20</td>
<td>6</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Semester 2 Elective*</td>
<td>O</td>
<td>O</td>
<td>20</td>
<td>6</td>
<td>2</td>
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</tbody>
</table>

* students may only choose 1 from these 2 elective units
BEng/MEng students select options to make up 60 credits per semester; Ordinary Programme 50 credits per semester.
### Stage 4 (2015-16 onwards)

<table>
<thead>
<tr>
<th>Code</th>
<th>Module Title</th>
<th>ETIE</th>
<th>Credit</th>
<th>Level</th>
<th>SEM</th>
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</thead>
<tbody>
<tr>
<td>SOE43xxxL</td>
<td>Interdisciplinary Competitive Design Project</td>
<td>C</td>
<td>10+10</td>
<td>7</td>
<td>1, 2</td>
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<tr>
<td>ENG4029M</td>
<td>Design Optimisation</td>
<td>C</td>
<td>10</td>
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<tr>
<td>SOE43xxxM</td>
<td>Computational Methods</td>
<td>C</td>
<td>10</td>
<td>7</td>
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<tr>
<td>ENG4072M</td>
<td>Risk Management</td>
<td>C</td>
<td>10</td>
<td>7</td>
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<tr>
<td>MAN4284M</td>
<td>Entrepreneurship and Innovation</td>
<td>O*</td>
<td>10</td>
<td>7</td>
<td>2</td>
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<tr>
<td>MAN4302M</td>
<td>Technology and Innovation Management</td>
<td>O*</td>
<td>10</td>
<td>7</td>
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<tr>
<td>xxxxx</td>
<td>SEM1 Elective</td>
<td>O+</td>
<td>20</td>
<td>7</td>
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<tr>
<td>CM-0430D</td>
<td>Control Systems Design</td>
<td>O</td>
<td>20</td>
<td>7</td>
<td>1</td>
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<tr>
<td>CM-0434D</td>
<td>Sustainable Power Systems &amp; SMART Grid Technology</td>
<td>O</td>
<td>20</td>
<td>7</td>
<td>1</td>
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<tr>
<td>CM-0431D</td>
<td>Digital Communications</td>
<td>O</td>
<td>20</td>
<td>7</td>
<td>1</td>
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<tr>
<td>CM-0360D</td>
<td>Automation &amp; Control</td>
<td>O#</td>
<td>20</td>
<td>6</td>
<td>1</td>
</tr>
<tr>
<td>CM-0432D</td>
<td>Mobile &amp; Wireless Communications</td>
<td>O</td>
<td>20</td>
<td>7</td>
<td>1</td>
</tr>
<tr>
<td>CM-0436D</td>
<td>Research Methods &amp; Skills</td>
<td>O</td>
<td>20</td>
<td>7</td>
<td>2</td>
</tr>
<tr>
<td>CM-0433D</td>
<td>Medical Electronics Systems</td>
<td>O</td>
<td>20</td>
<td>7</td>
<td>2</td>
</tr>
<tr>
<td>ENG4121D</td>
<td>Mobile Robotics &amp; Wireless Sensors</td>
<td>O</td>
<td>20</td>
<td>7</td>
<td>2</td>
</tr>
<tr>
<td>CM-0435D</td>
<td>Satellite Communications and Applications</td>
<td>O</td>
<td>20</td>
<td>7</td>
<td>2</td>
</tr>
<tr>
<td>CM-0361D</td>
<td>Advanced Electronic Systems Design</td>
<td>O#</td>
<td>20</td>
<td>6</td>
<td>2</td>
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<tr>
<td>CM-0362D</td>
<td>Radio Systems Design</td>
<td>O#</td>
<td>20</td>
<td>6</td>
<td>2</td>
</tr>
<tr>
<td>xxxxx</td>
<td>SEM2 Elective+</td>
<td>O</td>
<td>20</td>
<td>7</td>
<td>2</td>
</tr>
</tbody>
</table>

MEng students select options to make up 60 credits per semester.

* Students MUST select 10 credits (only) from starred Management modules,
  + Select one crossed module only and
  # Not more than one 20-credit Level 6 option from those not already studied at Stage 3.
BEng students meeting the MEng progression criteria at Stages 1-3 may transfer to the MEng route.

Students may include a period of study abroad in place of all or part of the industry placement.

The curriculum may change, subject to the University's programme approval, monitoring and review procedures.

Teaching and Assessment Strategies

The teaching and learning strategy takes into consideration the learning outcomes, progression through the levels of study, the nature of the subject and the student intake, and the need for you to take greater responsibility for your own learning as you progress through the course. The strategies and methods are as follows.

- The teaching and learning methods in the courses are designed to engage you in developing your knowledge and understanding of the course. They include formal lectures (including those from visiting lecturers), seminars, case studies, tutorial exercises, practical demonstrations, directed learning and individual work. The method of assessment is by written examination and both analytical and experimental coursework.

- The methods implemented to develop your intellectual skills include: engaging with you during tutorial exercises; case studies; practical demonstration; and supervised research or project work. Embedded in many modules at all levels is material to develop your skills and understanding of sustainable development and the importance of an ethical approach to engineering. You will also learn the skills associated with designing and executing your own research project in a number of modules, but particularly in the stage 3 individual Project.

- The methods implemented to develop your practical skills include demonstrations and practical classes linked with the taught modules. You will also design and operate equipment and/or procedures and use instruments for measurement and
control under supervision during your laboratory and project work. The methods used to assess practical skills will also provide feedback on laboratory work linked with the taught modules. In addition, a large part of the mark for the Stage 3 Project Report will be attributed to experimental method and the presentation & discussion of results.

- The methods implemented in developing your transferable skills are implicit in the programme. The University of Bradford is well known for attracting students from a wide variety of background, experiences and countries. This and the learning facilities available to all students provide the conditions for you to develop and manage your own learning. The University of Bradford maxim, Making Knowledge Work, is imbedded in the philosophy of this course, particularly in the area of Engineering, Design and Technology, which is well equipped with practical and computational facilities. The methods of assessment of transferable skills are built into the structure of the examinations, case studies, laboratory demonstrations and research or project work.

Assessment Regulations

Whilst this Programme conforms to the general principles set out in the standard University Assessment Regulations which are available at the link below there are four exceptions to these regulations which can be found at:

http://www.bradford.ac.uk/academic-quality-unit/ordinances-and-regulations-for-taught-courses/

Requirements for IET Accredited Degrees and Waivers from the Regulations

In order to meet the requirements of the IET accreditation, students must be enrolled on the Bradford campus programmes for at least the last two years of their programme. Additionally, they must satisfy the terms of the waivers 1-4 below.

1. The MEng is a single, classified award with classifications based on the best 100 credits at Stages 2,3,4 weighted 10%, 40% and 50% respectively. Modules passed at second attempt are capped at 40%.

2. To be compliant with IET guidelines, and for equivalence with IET accredited MSc programmes, the MEng programmes require a pass-mark at Stage 4 of 50% in 100 credits with the remaining 20 credits being at a minimum of 40%.

3. For progression from Stage 3 of the MEng programme, students must meet the requirements for a BEng 2.2, i.e. the average of Stages 2 and 3, weighted 20% and 80% respectively is greater or equal to 48%, with no discounting of modules.

4. BEng students eligible for a 2.2 or better at Stage 3 may transfer to Stage 4 of the equivalent MEng programme.

Admission Requirements

The University welcomes applications from all potential students regardless of their previous academic experience; offers are made following detailed consideration of
each individual application. Most important in the decision to offer a place is our assessment of your potential to benefit from your studies and of your ability to succeed on this particular programme. Entrance requirements for each programme will vary but consideration of your application will be based on a combination of your formal academic qualifications and other relevant experience.

If you have prior certificated learning or professional experience which may be equivalent to parts of this programme, the University has procedures to evaluate this learning in order to provide you with exemptions from specified modules contained within the curriculum. Please talk to us if you do not fit the standard pattern of entry qualifications.

The University of Bradford has always welcomed applications from disabled students, and these will be considered on the same academic grounds as are applied to all applicants. We are continually reviewing and developing our practices and policies to make the University more inclusive, but if you are disabled we may need to make some adjustments to make sure that you are not disadvantaged. We would advise you to contact the Programme Leader before you apply to discuss these.

A typical offer to someone seeking entry through the UCAS scheme would be 340 UCAS points with mathematics (minimum of grade C) and a physical science studied at A-level or equivalent. However, applications are welcome from mature students (those over 21 years of age on entry) and candidates with non-standard qualifications or who, lacking academic qualifications, have significant relevant experience. On completion of a UCAS form you will be invited to the School for an Open Day when you will have the opportunity to meet staff, view the facilities and discuss “the Bradford experience” with current students.

Learning Resources

The JB Priestley Library on the city campus and our specialist library in the School of Management provide a wide range of printed and electronic resources to support your studies. We offer quiet study space if you want to work on your own, and group study areas for the times when you need to discuss work with fellow students. Subject librarians for each School provide training sessions and individual guidance in finding the information you need for your assignment, and will help you organise your references properly.

Student PC clusters can be found in both our libraries and elsewhere on the campus. Many of these are open 24/7. You can also use the University’s wireless network to access the internet from your own laptop. Most of our journals are available online (both on and off campus), and you can also access your University email account, personal information and programme-related materials this way.

Staff are on hand during the daytime to help you if you get stuck, and there is a 24/7 IT helpline available.

The Faculty of Engineering and Informatics also provides a number of well-resourced computer suites with access to a wide range of specialist software tools as well as a large number of well-equipped, general and specialist laboratories for teaching and research supported by a team of helpful computer officers and technicians.
Students all have timetabled academic support sessions in small groups with their personal tutor in Stage 1.

The Learner Development Unit provides support in all aspects of academic, maths, numeracy and interpersonal skills. A programme of interactive workshops is delivered during both semesters which complement individual support available from Advisers and the wide range of interactive online materials available from the LDU website.

**Student Support and Guidance**

*Programme Team*

Support for you personally and in your programme of study, will be provided both by the University and the Programme Team. You will be allocated a personal tutor who is someone with whom you will be able to talk about any academic or personal concerns. The School will ensure that there is someone available with whom you feel comfortable to help and support you. You will be provided with a comprehensive series of handbooks that you can consult on a range of learning issues and your programme tutors will be available to consult on subject specific queries.

*Students’ Union*

We value the feedback provided by students and collaborate with the Students’ Union, through a system of Student representatives and formal staff student liaison committees, so that any issues you wish to raise are addressed rapidly.

The Students Union provide professional academic representation and advice. The Students’ Union and the University of Bradford work in partnership to provide confidential counselling and welfare services where you can get help with any aspect of your personal or academic life. Student Financial and Information Services (based in the Hub) will provide you with information about a diverse range of issues such as council tax, personal safety and tourist information. International Students can access a range of additional advice and support services through the Student’s Union.

**Employability and Career Development**

The University is committed to helping students develop and enhance their employability profile and capabilities through learning opportunities embedded within the curriculum.

Furthermore, the University is committed to supporting students to develop their commitment towards a career pathway(s) and to implementing a career plan. Professional career guidance and development support is available throughout your time as a student and as a graduate from Career Development Services. The support available from Career Development Services includes a wide range of information resources, one to one appointments, a weekly workshop programme, a mentoring programme, graduate recruitment and careers fairs, plus information and help to you find part time work, summer work placements, graduate internship programmes and graduate entry vacancies. In addition, some students as part of their programme of study may have the opportunity to complete a Career and Personal Development accredited module delivered by the Career Development Service.
As for all students you encouraged to access Career Development Services at an early stage during your studies and to use the extensive resources available on their web site www.careers.brad.ac.uk.

Career Development Services annually undertakes a survey of all graduates to find out their destination six months after graduation. The survey gathers data on the employment and further study routes graduates have entered and a range of other information including job roles, name and location of employers, salary details etc. The survey findings for each programme of study are presented on the programme information pages on the University website and via Career Development Services’ website www.careers.brad.ac.uk

Within the Electronics Programmes, students are encouraged to become student members of the Institution of Engineering & Technology (IET), which provides a range of support both throughout your time as a student and also when you begin your search for jobs and throughout your early career. This includes web-based support, study resources, contacts with local associations, mentoring, access to scholarship and bursary opportunities, the IET library, job-hunting and CV tips, newsletter, discounted software and discounted membership following graduation.

The IET accredit our programmes and manage the process for professional registration as an Incorporated or Chartered Engineer.

Our 5-year MEng programme includes a one-year placement in industry, leading to the diploma of industrial studies. Students are supported in their applications for placements by the School Industrial Relations Tutor and Placements Administrator who arrange a number of information and support sessions. The Careers Centre provide help to students in refining their CV and applications. All the evidence is that the confidence and experience that you will gain through the placement help to motivate you to get more out of your studies and have a better chance of promptly moving into graduate employment.

**Academic Skills Advice**

For undergraduate students who are looking to improve their marks during their time at university, study skills and maths advice is available to all regardless of degree discipline or level of study. Students can access a programme of interactive workshops and clinics which is delivered throughout the year. This is in addition to our extremely popular face-to-face guidance from Academic Skills Advisers, who also offer a wide range of online and paper based materials for self-study.

**Disability**

Disabled students will find a supportive environment at Bradford where we are committed to ensuring that all aspects of student life are accessible to everyone. The Disability Service can help by providing support, advice and equipment to help you get the most out of your time at Bradford. It is a place where you can discuss any concerns you may have about adjustments that you may need, whether these relate to study, personal care or other issues. For more information contact the Disability Service by phoning: 01274 233739 or via email: disabilities@bradford.ac.uk

**University policies and initiatives**
Learning and Teaching

Our University approach to learning, teaching and assessment is encapsulated by an integrated set of themes and principles within our Curriculum Framework. All of our degree programmes have been designed to provide you with an inclusive and engaging learning environment which gives you the opportunity to thrive and develop in your area of study. Our research-informed programmes have a particular focus on developing your employability. We also place a strong emphasis on collaborative, real-world and enquiry-based learning, supported by appropriate learning technologies. Our assessment is designed not just to measure your achievement, but also to shape and guide your learning through preparing you for the increasing level of challenge as you progress through your degree. Together, these lead to you developing a distinctive set of graduate attributes which will prepare you for life beyond university.

Ecoversity:

Ecoversity is a strategic project of the University which aims to embed the principles of sustainable development into our decision-making, learning and teaching, research activities campus operations and lives of our staff and students. We do not claim to be a beacon for sustainable development but we aspire to become a leading University in this area. The facilities we create for teaching and learning, including teaching spaces, laboratories, IT labs and social spaces, will increasingly reflect our commitments to sustainable development. Staff and student participation in this initiative is crucial to its success and its inclusion in the programme specification is a clear signal that it is at the forefront of our thinking in programme development, delivery, monitoring and review. For more details see www.bradford.ac.uk/ecoversity

Further Information:

For further information, please check the University prospectus or contact Admissions.

The Admissions Office
The University of Bradford
Richmond Road
Bradford, BD7 1DP
UK
+44 (0)1274 233054
http://www.brad.ac.uk/courses/

The Admissions Office
Faculty of Engineering and Informatics
Chesham Building
The University of Bradford
Richmond Road
Bradford, BD7 1DP
UK
+44 (0)1274 234567
http://www.bradford.ac.uk/ei/electrical-engineering-and-computer-science/about/electrical-engineering/
The contents of this programme specification may change, subject to the University's regulations and programme approval, enhancement and review procedures.
### Appendix Detailed ILO Mapping

<table>
<thead>
<tr>
<th>Modules Levels 4-7</th>
<th>Underpinning Science and mathematics</th>
<th>Engineering Analysis</th>
<th>Design</th>
<th>Environmental &amp; Social Context and Professional Skills</th>
<th>Engineering Practice</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Level 4 ILO1</td>
<td>Level 4 ILO2</td>
<td>Level 4 ILO3</td>
<td>Level 4 ILO4</td>
<td>Level 4 ILO5</td>
</tr>
</tbody>
</table>

#### Stage 1 Level 4

- **Engineering Analysis**
  - Level 4 ILO1: C
  - Level 4 ILO2: P
  - Level 4 ILO3: S

- **Developing Professional Skills**
  - Level 4 ILO5: P

- **Practical Electronics**
  - Level 4 ILO5: P

- **C-Programming with Robots**
  - Level 4 ILO5: P

- **Digital and Analogue Electronics**
  - Level 4 ILO5: S

- **Electrical Engineering Fundamentals**
  - Level 4 ILO5: P

#### Stage 2 Level 5

- **Further Engineering Analysis & Statistics**
  - Level 5 ILO1: C
  - Level 5 ILO2: P

- **Finance & Project Management**
  - Level 5 ILO2: P

- **System Design Group Project**
  - Level 5 ILO2: P

- **Digital Systems Design**
  - Level 5 ILO5: S

- **Analogue Electronics & Electrical Systems**
  - Level 5 ILO5: S

- **Telecommunications Engineering**
  - Level 5 ILO5: S

#### Stage 3 Level 6

- **Signal Processing**
  - Level 6 ILO5: S

- **Stage 3 Project (individual)**
  - Level 6 ILO5: S

- **Advanced Electronic System Design**
  - Level 6 ILO5: S

- **Mobile & Satellite Communications**
  - Level 6 ILO5: S

- **Automation & Control**
  - Level 6 ILO5: S

- **Radio Systems Design**
  - Level 6 ILO5: S

- **Elective Option**
  - Level 6 ILO5: S

#### Stage 4 (MEng only) Level 7

- **Design Optimisation**
  - Level 7 ILO5: S

- **Computational Methods**
  - Level 7 ILO5: S

- **Interdisciplinary Competitive Design Project**
  - Level 7 ILO5: S

- **Risk Management**
  - Level 7 ILO5: S

- **Entrepreneurship and Innovation (O)**
  - Level 7 ILO5: S

- **Technology and Innovation Management (O)**
  - Level 7 ILO5: S

- **Control Systems Design (O)**
  - Level 7 ILO5: S

- **Power Systems & SMART Grid Technology**
  - Level 7 ILO5: S

- **Mobile Robotics & Wireless Sensors**
  - Level 7 ILO5: S

- **Satellite Comms and Applications**
  - Level 7 ILO5: S

- **Digital Communications**
  - Level 7 ILO5: S

- **Mobile & Wireless Communications (O)**
  - Level 7 ILO5: S

- **Research Methods & Skills**
  - Level 7 ILO5: S

- **Medical Electronics Systems**
  - Level 7 ILO5: S
Mapping ILOs against the MEng in Electronics, Telecommunications and Internet Engineering Engineering

<table>
<thead>
<tr>
<th>+ EEE only, * ETIE only</th>
<th>P Principal</th>
<th>S Supporting</th>
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