Plymouth University

Faculty of Science and Engineering
School of Computing Electronics and Mathematics

Programme Specification

BEng (Hons) Electrical and Electronic Engineering

Programme Code 0125

BEng (Hons) Electrical and Electronic Engineering (Integrated)

Programme Code 4124

September 2016
1. **BEng (Hons) Electrical and Electronic Engineering**

   **Final award title:**  BEng (Hons) Electrical and Electronic Engineering

   **Intermediate award title(s):**  Certificate of Higher Education  
   Diploma of Higher Education

   **UCAS code H604**  
   **JACS code H600**

2. **Awarding Institution:**  University of Plymouth

   **Teaching institution(s):**  University of Plymouth

3. **Accrediting body(ies)**  
   The Institution of Engineering and Technology (IET)

   Full visit for re-accreditation due in Academic Year 2015/16

4. **Distinctive Features of the Programme and the Student Experience**

   The BEng (Hons) Electrical and Electronic Engineering programme provides a course of study at honours level which is accredited by the Institution of Engineering and Technology (IET). The programme partially satisfies the educational requirements for Chartered Engineer (CEng) registration and enables employment as a professional engineer.

   The programme moves gradually from a taught-based approach in the first two years to a project-based approach in the final year, with the aim to encourage and support students to develop a self-motivated learning attitude and self-management skills, such as working effectively under time and resource constraints.

   At Plymouth University we strongly believe that practical experience provides the best context for grounding and practising theoretical knowledge. Thus, through substantial hands-on sessions in the extensive lab facilities available at the University, the programme aims to provide students with an immersive learning-by-doing experience, which will develop fundamental practical and analytical skills in electronic, embedded and high-level programming, renewable energy, communications and robotics research. This will be complemented by in-depth theoretical, analytical, and design abilities required for undertaking managerial engineering roles in their future career.

   A fundamental role is played by hardware design, analysis, building and programming. Microprocessors are introduced to students in the first week of teaching and it will be through the design, analysis and programming of increasingly
complex systems that knowledge and engineering practice will be integrated and contextualised. By moving from simple programmable devices to complex communications and renewable energy systems, students will experience analogue and digital electronics, embedded and high-level programming, classical and modern control theory, as well as kinematics and the most relevant modelling techniques. Extensive Electrical and Electronic Engineering practice is complemented by theoretical lectures on principles and mathematics, which provide the essential background and analytical tools of a modern engineer.

The final year of BEng provides the opportunity for the students to engage on a challenging individual project, which is entirely led by the students, and for which they are responsible from early inception to conclusion. The final project is a milestone in the entire course and allows for experiences that will prove the technical and engineering skill of the students, but also will provide awareness of the business implications of engineering decisions and will test essential transferable skills, such as time-management and self-reliance.

The programmes are greatly enhanced by high-qualified staff that enjoy international recognition in fore-front electrical, electronics, communications and robotics research. This creates a fertile research environment around the students and offers many occasions for deepening their knowledge through numerous workshops and seminars delivered by international researchers. The teaching also benefits from the positive research environment, as the lecturers will feed the latest findings and tools into their teaching, by exposing the students to new and exciting research.

As the BEng Electrical and Electronic Engineering programme is accredited by the Institute of Engineering Technology (IET), students on the programme are encouraged to enrol as student members with a view to becoming members after graduation. Whilst the BEng students are expected to follow careers in systems engineering, a good number will pursue other posts including some in research and development. BEng graduates can achieve Chartered Engineer status after an appropriate post graduate qualification (usually MSc) and suitable working experience.

The first two years of study develop a relatively common foundation of knowledge and skills to support final level specialisation. Final level modules are carefully tailored to optimise graduate ability to ‘hit the ground running’ in their chosen specialist field.

In line with our commitment to lifelong learning, students are encouraged to take an industrial placement following Level 5 of the programme, and help is provided to secure suitable placements. Integrated Professional Development Planning is also encouraged and supported.

The course links theory through to practice, with a high commitment to project work. Students will design, analyse, construct and test analogue and digital circuits and
systems operating at commercial frequencies. They will also write high and low level code and study good software engineering practice. This culminates with our final level project showcase where students compete for industrially sponsored prizes. As well as offering meaningful collaboration and publicity. The Level 6 project is an opportunity to showcase project work to colleagues and recruiters from industry, internal and external examiners and other students, often generating company interviews or immediate job offers.

Employment prospects from the course are very good, both in the UK and abroad. Our students are highly thought of by industry and Plymouth BEng graduates are often found in senior positions (such as Senior Design Engineer). We benefit from enthusiastic industrial support via guest presentations, equipment and prize donations and course development.

**Personal Development Planning (PDP)**
Level 4 and 5 students will receive career related guidance via a variety of mechanisms that are directed to ensure that students obtain placement opportunities which will enable them to realise their true potential. These include project based practicals (e.g. ELEC230), in which students are encouraged to develop their group work interaction, to produce a business plan, keep a log book and present their work in front of an audience.

Students on a professional training year will be able to develop their PDP further through the training reflective journal.

Level 6 students are expected to be able to self-manage their learning and career planning. However, support is available via project supervisor and personal tutor.

5. **Relevant QAA Subject Benchmark Group(s)**
   QAA Subject benchmark: Engineering.
   
The programme follows the IET UK-SPEC learning outcomes and integrates those not fully specified with additional QAA learning outcomes (e.g. Key and Transferable skills).

6. **Programme Structure**
The programme of study is comprised of the raft of modules outlined in this document with 120 module credits per level, with three levels of study. The aim is to develop skills consistent with those required in the Engineering Subject Benchmarks. This specification provides a concise summary of the main features of the programme and the learning outcomes that a typical student might reasonably expect to achieve and demonstrate if he/she takes full advantage of the learning opportunities available. More detailed information can be found in individual module literature provided during the course.
Module delivery methods are diverse but are usually a mix of lectures, seminars, tutorials, laboratory sessions, research investigations and problem clinics. This delivery involves teams of academic, technical, support staff and students. To support learning, the University operates an electronic learning environment accessed via the student portal. All students have dedicated accounts linked to this which forms the primary mechanism to arrange meetings with staff outside of programmed sessions. The campus is well equipped with computers and there are additional dedicated computer labs running specialist software to support this programme. Lecture and support materials are available via web access using the portal to facilitate home study and preparation for sessions.

The weighting of examination and coursework performance is ramped-up from Level 4 to 6. For example a Level 4 module in a particular theme may be weighted 50% examination, 50% coursework. In Level 5 this may be 60% examination, 40% coursework and by Level 6 it may be 70% examination, 30% coursework. The integrated programme consists of Level 4 of the standard BEng programme together with ILS1005: Interactive Learning Skills and Communications. Successful completion of both of these components allows students to proceed to Level 5 of the standard BEng programme.

Students are expected to pass all modules in order to progress with P+ being the only optional modules that exist. Industrial placement is also optional. Compensation is allowed in accordance with Plymouth University regulations.

Pass requirement for each module: 40% (≥ 30% in either coursework or examination elements).
Level 4 – 120 Credits
Currently a progression level until 2015/16 IET Accreditation visit when consultation for 10% weighting to be carried forward to the final award mark will be undertaken. Intermediate award on satisfactory completion of Level 4 but subsequent failure to progress leads to Certificate of Higher Education

<table>
<thead>
<tr>
<th>Semester</th>
<th>Module</th>
<th>Subject</th>
<th>Credit</th>
<th>E1 (%)</th>
<th>C1 (%)</th>
<th>T1 (%)</th>
<th>P1 (%)</th>
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</thead>
<tbody>
<tr>
<td>Immersive</td>
<td>ELEC143</td>
<td>Embedded Software in Context</td>
<td>20</td>
<td>100</td>
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<td></td>
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<tr>
<td>1</td>
<td>ELEC144</td>
<td>Electrical Principles &amp; Machines</td>
<td>20</td>
<td>70</td>
<td>30</td>
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<tr>
<td>1</td>
<td>MATH187</td>
<td>Engineering Mathematics</td>
<td>20</td>
<td>50</td>
<td>50</td>
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<tr>
<td>P+</td>
<td>ELEC137PP*</td>
<td>Electronic Design &amp; Build</td>
<td>20</td>
<td>100</td>
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<tr>
<td>P+</td>
<td>ROCO103PP*</td>
<td>Robot Design &amp; Build</td>
<td>20</td>
<td>100</td>
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<td></td>
</tr>
<tr>
<td>2</td>
<td>ELEC142</td>
<td>Digital Electronics</td>
<td>20</td>
<td>60</td>
<td>40</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>ELEC141</td>
<td>Analogue Electronics</td>
<td>20</td>
<td>60</td>
<td>40</td>
<td>P/F</td>
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<tr>
<td>2</td>
<td>BPIE112</td>
<td>Stage 1 Electrical/Robotics Placement Preparation</td>
<td>0</td>
<td></td>
<td>40%</td>
<td>52%</td>
<td>8%</td>
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*Optional P+ module (choose 1 module of study)

Delivery structure

<table>
<thead>
<tr>
<th>Semester 1 module</th>
<th>Semester 1 module</th>
<th>P+ module</th>
<th>Semester 2 module</th>
<th>Semester 2 module</th>
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For PUIC Integrated Programme only:

<table>
<thead>
<tr>
<th>1</th>
<th>ILS1005</th>
<th>Interactive Learning Skills &amp; Communications</th>
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</table>
Level 5 - 120 Credits
The overall mark from this level carries forward as 20% of the final BEng award. Intermediate award on satisfactory completion of Level 5 but subsequent failure to progress leads to *Diploma of Higher Education*

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<tr>
<th>Semester</th>
<th>Module</th>
<th>Subject</th>
<th>Credit</th>
<th>E1 (%)</th>
<th>C1 (%)</th>
<th>T1 (%)</th>
<th>P1 (%)</th>
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<tbody>
<tr>
<td>1</td>
<td>BPIE212</td>
<td>Stage 2 Electrical/Robotics Placement Preparation</td>
<td>0</td>
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<tr>
<td>1</td>
<td>MATH237</td>
<td>Engineering Mathematics &amp; Statistics</td>
<td>20</td>
<td>80</td>
<td>20</td>
<td></td>
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<tr>
<td>1</td>
<td>ELEC230</td>
<td>Embedded Hardware &amp; Software</td>
<td>20</td>
<td>50</td>
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<tr>
<td>1</td>
<td>ELEC239</td>
<td>Communications Systems</td>
<td>20</td>
<td>70</td>
<td>30</td>
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<td></td>
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<tr>
<td>2</td>
<td>ELEC233</td>
<td>Digital Electronics &amp; VHDL</td>
<td>20</td>
<td>50</td>
<td>50</td>
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<tr>
<td>2</td>
<td>ELEC237</td>
<td>Power Electronics &amp; Generation</td>
<td>20</td>
<td>60</td>
<td>40</td>
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<tr>
<td>2</td>
<td>ROCO218</td>
<td>Control Engineering</td>
<td>20</td>
<td>60</td>
<td>40</td>
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Optional Industrial Placement
BPIE332 Electrical Engineering Industrial Placement (Generic)
**Level 6 – 120 Credits**

Final mark for award classification is **80% Level 6 + 20% Level 5**

Classification bands:
- First class honours: 70% and above.
- Upper second class honours: 60-69%
- Lower second class honours: 50-59%
- Third class honours: 40-49%
- Pass degree: 80 Level 6 credits.

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<tr>
<th>Semester</th>
<th>Module</th>
<th>Subject</th>
<th>Credit</th>
<th>E1 (%)</th>
<th>C1 (%)</th>
<th>T1 (%)</th>
<th>P1 (%)</th>
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<tbody>
<tr>
<td>1</td>
<td>ELEC347</td>
<td>Information &amp; Communication Signal Processing</td>
<td>20</td>
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<td>ELEC345</td>
<td>High Speed Communication</td>
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<td>1</td>
<td>ROCO319</td>
<td>Modern Control Design</td>
<td>20</td>
<td>70</td>
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<tr>
<td>2</td>
<td>ELEC349</td>
<td>Design and Control of Renewable Energy Technology</td>
<td>20</td>
<td>70</td>
<td>30</td>
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<tr>
<td>2</td>
<td>PROJ324</td>
<td>Individual Project</td>
<td>40</td>
<td>90</td>
<td>10</td>
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</tbody>
</table>

7. **Programme Aims**

The general aims of the course are to:

- be inspirational and to support the students to unlock their potential with an innovative, experience-based, and self-motivated approach to Electrical and Electronic Engineering and to support their personal and professional development for a fulfilling post-graduate career in engineering;
- provide a sustained programme of study at honours level that satisfies the requirements of accreditation by the Institution of Engineering and Technology and enables employment as a professional engineer;
- be highly informative and capable of stretching the intellectual skills of students to form an exceptional knowledge base suitable for a future career in Engineering based industry and research.
- encourage and support students during their professional development in applying technical and generic skills and to foster flexible and creative intellectual skills that will facilitate life-long learning and continuing professional development.
- establish an extensive and in-depth foundation knowledge on which to develop further skills as technology advances and to enable students to apply engineering principles, mathematical modelling and advanced design methods to robotics and electronics problems;
- provide the opportunity to 'learn through design' via practical and project based work, particularly within the context of circuits and electrical and electronics
systems design (including renewable energy systems, embedded systems, communications, robots).

8. Programme Intended Learning Outcomes
On completion graduates should have developed the following knowledge, understanding and skills:

Knowledge and Understanding
KU1. Understand the scientific principles and methodology necessary to enable appreciation of scientific and engineering context in electrical and electronic development, and to support the understanding of historical, current, and future developments in electrical and electronic engineering;
KU2. Understand engineering principles applied to electrical and electronic contexts and to apply them to analyse key engineering processes;
KU3. Identify, classify and describe the performance of analogue and digital systems and components, through the use of analytical methods and modelling techniques;
KU4. Apply quantitative methods and computer software relevant to solve electrical and electronic control problems and to model complex engineering systems;
KU5. Understand technical, social, and ethical aspects of modern electrical and electronic engineering research and development.

Intellectual Skills
IS1. Apply and integrate knowledge and understanding of other engineering and scientific disciplines to support the creative design of innovative solutions to engineering problems;
IS2. Investigate and define a problem and identify constraints including environmental and sustainability limitations, health and safety and risk assessment issues;
IS3. Understand legal requirements, professional and ethical conduct, and commercial and economic context of engineering processes and solutions.

Key and Transferable Skills
TS1. Understand and apply mathematical principles, methods, tools and notation proficiently in the analysis and solution of engineering problems;
TS2. Communicate effectively in written and oral form and proficiently use ICT technologies for effective communication purposes;
TS3. Reflect on their own learning, being autonomous in learning, being self-critical and demonstrate self-reliance to progress and plan for personal and professional development;
TS4. Work with, and relate effectively to others in the organization and management of group projects.
Practical Skills

PS1. Apply knowledge of characteristics of particular materials, equipment, processes, or products in the design and build of integrated software and hardware components, such as mechanical parts and electronic circuits;

PS2. Assess and use the appropriate hardware and software tools for the design and build of electrical and electronic systems in modern workshop and laboratory settings.

PS3. Identify and use modern modelling software for the design and analysis of engineering control systems, electronic circuits, and models applied to electrical and electronic systems design.

PS4. Individually and autonomously manage an engineering project from its inception to the final realisation.

9. Admissions Criteria, including APCL, APEL and DAS arrangements

Level 4 entry:
- **A Level/AS level**: 300 points from at least two A-levels, to include Mathematics and Science/Technology at grade B. AS levels or a 6 unit Vocational A level in relevant subjects considered with required A levels.
- **18 Unit BTEC National Diploma/QCF Extended Diploma**: DDM in Engineering/Science/Technology BTEC. To include Distinction in Maths as a core module Maths for Technicians. (IT Practitioners not accepted).
- **International Baccalaureate**: 30 overall to include 5 at HL Maths and 5 at HL relevant second relevant subject. If overseas and not studying English within IB – MUST have **IELTS**: 6.0 overall with 5.5 in all other elements
- **European Baccalaureate**: 78% overall with 8.5 in Maths and 8.5 in relevant Science/Technology subject and 7.5 in English or first language.
- **Irish Highers**: ABBBB @ Highers including Maths and 2nd Science/Technology subject.
- **Welsh Baccalaureate**: accept as add on points of 120 but also meet standard offer
- **Extended Project**: accept if in a relevant subject as an add on but also must be studying at least 2 A Levels.
- **Progression from FPT**: Engineering with Foundation courses, pass with an overall average of 50%.
- **PUIC Integrated Programme**: Admission to the programme is subject to successful completion of the Plymouth University International College (PUIC) Foundation Year with an aggregate mark of at least 60% in each of the modules studied (65% in ILSC1004: Interactive Learning Skills and Communications).

Level 5 entry:
- **Articulation International Colleges**: HNC with at least 70%.
- **Progression from PUIC Integrated Programmes**.
- **Other**: Each case considered on its merits, normally HND level or above.
Level 6 entry:
- **Articulation International Colleges**: HND with at least 60%.
- Progression from Partner Colleges.

APEL is considered on individual basis by admission tutors who will assess the suitability for the programme and will indicate the appropriate entry stage in accordance with the level of experience documented by the applicant.

We welcome applications from applicants with disabilities. Applicants will be subject to standard academic selection procedures. Some students may be invited to attend an information meeting to ensure that Plymouth University can provide the required support, and to indicate where any adjustments may need to be made. Plymouth University’s Disability Assist Service is nationally recognised for its good practice in supporting learners with disabilities.

**PUIC Stage 1 Equivalent Integrated programmes**
On successful completion of their Stage 0 programme PUIC students progress to Stage 1 of their designated programme and are taught and assessed by PU staff. Additionally, the students will undertake a module (ILS 1005) of skills and support designed to facilitate their transition to the HE learning culture in the UK.

Progression to Stage 1 Integrated programmes is dependent upon achieving 50% in all modules of the PIUC Stage 0 programme.

Progression to PU Stage 2 is dependent upon successful completion of the PU Stage 1 and at least 60% in ILS 1005 (The PUIC DMD for ILS 1005 is appended).

**10. Progression criteria for Final and Intermediate Awards**
Students can transfer to the MEng at the end of Level 4 or 5 if their overall BEng classification is 2:1 or better.

Progression onto Level 5 of the degree is subject to passing Level 4 of the PUIC Equivalent Integrated Programme. This consists of the standard Level 4 of the programme plus ILS1005: Interactive Learning Skills and Communications.

**11. Exceptions to Regulations**
Level 4 does not count against final degree until IET Accreditation visit when consultation for 10% weighting to be carried forward to the final award mark will be undertaken.

**12. Transitional Arrangements**

<table>
<thead>
<tr>
<th>2015/16 Modules</th>
<th>2016/17 Modules</th>
</tr>
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<tbody>
<tr>
<td>BPIE100</td>
<td>BPIE112</td>
</tr>
<tr>
<td>BPIE200</td>
<td>BPIE212</td>
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13. Mapping and Appendices:

13.1. ILO’s against Modules Mapping

<table>
<thead>
<tr>
<th>Knowledge and Understanding</th>
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<tbody>
<tr>
<td>KU1</td>
<td>ELEC137PP, ELEC141, ELEC142, ELEC143</td>
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<tr>
<td>KU2</td>
<td>ELEC141, ELEC142, ELEC144</td>
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<tr>
<td>KU3</td>
<td>ELEC141, ELEC142, ELEC144, ELEC233, ELEC239</td>
</tr>
<tr>
<td>KU4</td>
<td>ELEC143, ELEC230, ROCO218</td>
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<tr>
<td>KU5</td>
<td>ELEC239, ELEC137PP</td>
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<table>
<thead>
<tr>
<th>Intellectual Skills</th>
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<tbody>
<tr>
<td>IS1</td>
<td>ELEC137PP, PROJ324</td>
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<tr>
<td>IS2</td>
<td>PROJ324</td>
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<tr>
<td>IS3</td>
<td>PROJ324</td>
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<thead>
<tr>
<th>Key and Transferable Skills</th>
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<tbody>
<tr>
<td>TS1</td>
<td>MATH187, MATH237, ROCO319, ELEC239, ELEC349, ELEC237</td>
</tr>
<tr>
<td>TS2</td>
<td>BPIE112, PROJ324, ELEC230</td>
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<tr>
<td>TS3</td>
<td>BPIE212, PROJ324</td>
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<td>TS4</td>
<td>ELEC230, ELEC345</td>
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<thead>
<tr>
<th>Practical Skills</th>
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<tbody>
<tr>
<td>PS1</td>
<td>ELEC137PP, ELEC345, ELEC233</td>
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<tr>
<td>PS2</td>
<td>ELEC141, ELEC142, ELEC143, ELEC230, ELEC233, ELEC345</td>
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<tr>
<td>PS3</td>
<td>ROCO218, ROCO319, ELEC347</td>
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<tr>
<td>PS4</td>
<td>ELEC230, PROJ324</td>
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13.2. Assessment against Modules Mapping

Already covered in structure

13.3. Skills against Modules Mapping

IET Skills mapping
1. UNDERPINNING SCIENCE AND MATHEMATICS

1.1 Scientific Principles and Methodology
US1 Knowledge and understanding of scientific principles and methodology necessary to underpin their education in their engineering discipline, to enable appreciation of its scientific and engineering context, and to support their understanding of historical, current, and future developments and technologies.

1.2 Mathematics
US2 Knowledge and understanding of mathematical principles necessary to underpin their education in their engineering discipline and to enable them to apply mathematical methods, tools and notations proficiently in the analysis and solution of engineering problems.

1.3 Integrated Engineering
US3 Ability to apply and integrate knowledge and understanding of other engineering disciplines to support study of their own engineering discipline.

2. ENGINEERING ANALYSIS
2.1 Application of Engineering Principles
<p>| | | | | | | | | | | |</p>
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<tbody>
<tr>
<td><strong>E1</strong> Understanding of engineering principles and the ability to apply them to analyse key engineering processes.</td>
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<tr>
<td><strong>2.2 Performance Classification and Modelling</strong></td>
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<tr>
<td>E2 Ability to identify, classify and describe the performance of systems and components through the use of analytical methods and modelling techniques.</td>
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<td><strong>2.3 Quantitive Methods and Computer Based Problem Solving</strong></td>
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<td>E3 Ability to apply quantitative methods and computer software relevant to their engineering discipline, in order to solve engineering problems.</td>
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<td><strong>2.4 Systems</strong></td>
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<td>E4 Understanding of and ability to apply a systems approach to engineering problems.</td>
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<tr>
<td>E3m Ability to extract data pertinent to an unfamiliar problem, and apply in its solution using computer based engineering tools when appropriate.</td>
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<tr>
<td><strong>3. DESIGN</strong></td>
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<tr>
<td>D1 Investigate and define a problem and identify constraints including environmental and sustainability limitations, health and safety and risk assessment issues;</td>
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<tr>
<td>D2 Understand customer and user needs and the importance of considerations such as aesthetics;</td>
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<tr>
<td>D3 Identify and manage cost drivers;</td>
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<tr>
<td>D4 Use creativity to establish innovative solution;</td>
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</tbody>
</table>
D5 Ensure fitness for purpose for all aspects of the problem including production, operation, maintenance and disposal; 

\[ \text{x x x x x} \]

D6 Manage the design process and evaluate outcomes.

\[ \text{x x x x x} \]

### 4. ECONOMIC, SOCIAL, AND ENVIRONMENTAL CONTEXT

<table>
<thead>
<tr>
<th>S1 Knowledge and understanding of commercial and economic context of engineering processes;</th>
<th>x x</th>
<th></th>
<th>x</th>
<th>x</th>
</tr>
</thead>
<tbody>
<tr>
<td>S2 Knowledge of management techniques, which may be used to achieve engineering objectives within that context;</td>
<td>x x</td>
<td></td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>S3 Understanding of the requirement for engineering activities to promote sustainable development;</td>
<td>x</td>
<td>x</td>
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<td>x</td>
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<tr>
<td>S4 Awareness of the framework of relevant legal requirements governing engineering activities, including personnel, health, safety, and risk (including environmental risk) issues;</td>
<td>x x x x x</td>
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<td>x</td>
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<tr>
<td>S5 Understanding of the need for a high level of professional and ethical conduct in engineering.</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
</tbody>
</table>

### 5. ENGINEERING PRACTICE

#### 5.1 Materials and Components

| P1 Knowledge of characteristics of particular materials, equipment, processes, or products. | x x | x x | x x | x x | x x | x x |

#### 5.2 Workshop and Laboratory Skills

| P2 Workshop and laboratory skills. | x | x x | x x | x x | x x | x x |

#### 5.3 Appropriate use of Engineering Knowledge
P3 Understanding of contexts in which engineering knowledge can be applied (e.g. Modified by the policy working party 2009 to include IEng UK-SPEC learning outcomes. 34 of 40 operations and management, technology development, etc).

<table>
<thead>
<tr>
<th>5.4 Technical Information</th>
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</thead>
<tbody>
<tr>
<td>P4 Understanding use of technical literature and other information sources.</td>
<td>x</td>
<td>x</td>
<td>x</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>5.5 Intellectual Property and Contracts</th>
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</thead>
<tbody>
<tr>
<td>P5 Awareness of nature of intellectual property and contractual issues.</td>
<td>x</td>
<td>x</td>
<td>x</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>5.6 Codes of Practice and Standards</th>
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</thead>
<tbody>
<tr>
<td>P6 Understanding of appropriate codes of practice and industry standards.</td>
<td>x</td>
<td>x</td>
<td>x</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>5.7 Quality</th>
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</thead>
<tbody>
<tr>
<td>P7 Awareness of quality issues.</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>5.8 Working with Uncertainty</th>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td>P8 Ability to work with technical uncertainty.</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
</tbody>
</table>

16
This Definitive Module Document (DMD) is designed for all prospective, enrolled students, academic staff and potential employers. It provides a concise summary of the main features of the module and the Specific Learning Outcomes (LOs) that a typical student might reasonably expect to achieve and demonstrate if he/she takes full advantage of the learning opportunities. Detailed information regarding the content and assessment criteria of this module should be considered alongside the appropriate Programme Specifications (PSS) and Module Guide (see MG ILS1005).

**Module Name**: Interactive Learning Skills and Communication (ILSC)

**Module Code**: ILS1005

**Module Duration (per semester)**: Thirteen (13) weeks

**Contact Hours (per semester)**: 52

**Directed Study Hours (per semester)**: 98

**Notional Hours (per module)**: 150

**Teaching Rotation**: 01, 03

**Teaching Body**: PUIC

**Articulating Institution**: Plymouth University

**Articulating Faculty**: Faculty of Science and Environment; Faculty of Arts and Humanities; Plymouth Business School

**University Campus**: Drakes Circus

**Pathways (on which this module is offered)**: All Integrated Pathways

**Credit Points**: Zero

**Pathway Stage**: PUIC Stage 2 (Plymouth University Stage 1)

**Stage FHEQ Level**: 4

**Language of Delivery**: English

**Language of Assessment**: English

**E-Learning**: IT software packages (Word, PowerPoint, Excel), internet access; College Portal; University Student Portal.

**Moderation**: See CPR QS9

**Standard Progression Criteria**: Summary: minimum overall pass mark of 65% (Grade C*) across all assessment events and a minimum of 65% in assessments B, D and E. See CPR QS9.

**Failure to Progress**: [Summary: a student may not fail a module assessment on more than one (1) occasion, failure of the module assessment once requires that a student re-sit the failed assessment thereafter re-take the entire module at full cost; failure of a student to complete a module on the re-take of that module will result in referral to the College Learning and Teaching Board for a student management decision. The University will not be incumbent to progress students who fail].

**Aims**: This module has been designed to be delivered in conjunction with the Integrated FHEQ Level 4 (equivalent) first year degree and associated programmes in order to benchmark and satisfy the transfer criteria with regard to student communication and learning skills competency. This module is part of a wider pedagogic approach taken by NAVITAS UK to ensure the preparedness of its students and graduates with a focus on the relevant transferable and portable skills of effective and professional communication to support further study at a variety of levels, whether it involves higher education or further post-degree vocational programmes and/or professional awards, as well as providing a basis to foster career and life-building skills.
Utilising a number of practical activities to allow candidates to achieve these essential skills, students will be introduced to techniques and strategies to manage speech anxiety; enhance grammar and vocabulary; think critically under pressure; research, package and deliver logical and persuasive communication both orally and in a variety of written formats (inclusive of dissertation); summarise; become an effective listener; understand cultural and gender differences; and work effectively in a team.

This module ensures that graduates have attained the prescribed level of inter-disciplinary communication competence described as Level B2 ‘Proficient User’ by the Council of Europe, see Common European Framework of Reference for languages: Learning, teaching assessment 2001, Council of Europe, CUP, Cambridge, p. 24, Table 1. Common Reference Levels: global scale. This module is ACL accredited and benchmarked: ACL is a leading provider of English language provision to students seeking entry to Australian HEIs and a variety of levels. ACL now forms part of Navitas English and carries dual accreditation by the Australian National ELT Accreditation Scheme (NEAS) and the NSW Government’s Vocational Education and Training Accreditation Board (VETAB). Navitas English is also a Registered Training Organisation (RTO) under the Australian Quality Training Framework (AQTF).

Successful completion of this module indicates that students have obtained a good understanding of and ability to apply the requisite knowledge and skills to enable them for successful onward study at undergraduate degree level.

### Topics
- Preparation for college and university programmes
- Personal development planning (PDP)
- Presentation skills
- Listening skills
- Skills for self-directed study
- Appropriateness
- Library induction
- Writing at university
- Analysing questions/itles
- Planning written work projects
- Teamwork
- Composition and style
- Summarising techniques
- Revision techniques
- Examination overview and techniques
- Critical analysis and use of evidence

### Specific Learning Outcomes

<table>
<thead>
<tr>
<th>Knowledge and Understanding</th>
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<tbody>
<tr>
<td>Upon completion of this module students will be able to demonstrate their knowledge and understanding of the following:</td>
</tr>
</tbody>
</table>

1. The structure of the UNIVERSITY degree programmes and classification.
2. UNIVERSITY undergraduate degree scheme structures and awards.
3. UNIVERSITY laboratory, library and e-learning facilities; College resources and personal resources to support study.
4. Time management and its application to notional hours of study and assessment events.
5. Public speaking techniques and managing communication apprehension.
6. Non-verbal communication techniques.
7. Listening skills and knowledge dissemination and retention techniques.
8. The importance of ensuring a clear basic understanding of the history of scholarship with regard to certain subject areas and/or the use of appropriate nomenclature to aid communication.
9. What language styles to employ in a variety of situations to ensure appropriateness and clarity of communication.
10. A comprehensive set of clear writing techniques (plain English, factual and persuasive writing) that can be applied to a variety of written formats.
11. How to create appropriate and effective document layouts.
12. The importance and basic precepts of style when composing written work in a variety of forms.
13. How to embed the concept of continuous improvement and objectivity in relation to an individual’s academic performance.
14. Professional communication and presentation.
15. How to enhance personal creativity and lateral thought processes.
16. Examination techniques and skills.
Design and communicate effective messages to a variety of audiences.

How to work effectively as a team member.

How to work effectively as an individual.

How to apply basic research and referencing techniques to formulate reasoned academic opinion in a variety of forms so as to avoid plagiarism and collusion.

B Intellectual / Cognitive Skills

1 Ability to employ appropriate nomenclature and terminologies across subject contexts.

2 Ability to analyse various modes of information when delivered in different formats.

3 Make full use of library and e-learning search (catalogue and bibliographic) resources.

4 Ability to effectively retain and communicate knowledge and understanding of topics covered in the module in a comprehensive manner under timed conditions without re-course to learning aids.

C Practical Skills

1 Develop organisational skills for deadline submission.

2 Proficiently use techniques and technology in the collation, interpretation and presentation of data in oral and written formats.

3 Develop oral presentation skills.

4 Develop written skills for a variety of formats and requirements.

D Transferable Skills

1 Select, read, digest, summarise and synthesise information material in a variety of forms, both qualitative and quantitative (text, numerical data and diagrammatic) and in an appropriate manner to identify and determine key facts/themes, relevancy and assessment of problems and identification and implementation of solutions.

2 Use and clearly communicate discursive, numerical, statistical and diagrammatic ideas, concepts, results and conclusions using appropriate technical and non-technical language and language style, structure and form.

3 Apply basic research and referencing techniques to all aspects of study, information collation, information presentation and formulation of academic opinion.

4 Embedding the importance of self-study and reliance. This involves cultivating and developing a responsibility within each student to take cognizance for their own learning, initiative, effective time-management and self-discipline within the academic and professional environments.

Generic Learning Outcomes

Key skills demonstrated:

Personal organisation and time-management skills to achieve research goals and maintain solid performance levels;

Meet converging assessment deadlines – based on punctuality and organisation with reference to class, group and individual sessions within a dynamic and flexible learning environment with variable contact hours and forms of delivery.

Understanding of the importance of attaining in-depth knowledge of terminology as used in a given topic area, as a basis to further study;

Communicate clearly using appropriate nomenclature to enhance meaning in all oral and written assessments with no recourse to collusion or plagiarism.

Understanding, knowledge and application of appropriate and effective methods of communication to meet formal assessment measures;

Present clearly, coherently and logically in a variety of oral and written formats using a variety of appropriate qualitative and quantitative tools and evidence bases.

Understanding and knowledge as to the development of the industry and/or scholarship in relation to a given topic under study;

Demonstrate an understanding of the current themes of a given topic, the academic and practical foundation on which they are based – demonstrated by a lack of plagiarism and need for collusion in both individual and group work.

Understanding of the rules applying to plagiarism and collusion;

Collate, summarise, reason and argue effectively on a given topic without reference to another’s work or ideas/concepts.

Ability to work as an individual, in a small team and in a larger group to effect data collation, discussion and presentation of evidence;

Meet and succeed in each of the varied assessments presented.

Assessment

<table>
<thead>
<tr>
<th>Assessment Type</th>
<th>Duration</th>
<th>Method</th>
<th>Topic</th>
<th>Schedule</th>
<th>Weighting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assessment E</td>
<td>10 weeks</td>
<td>efficacy of individual PDP</td>
<td>Attendance and participation in PDP</td>
<td>NA</td>
<td>10%</td>
</tr>
<tr>
<td>Assessment A</td>
<td>Nine (9) weeks</td>
<td>research project (1,500 – 2000 words)</td>
<td>Computing/engineering/biological or biomedical/environmenst studies</td>
<td>Set session 2.2 Submission session 11.1</td>
<td>30%</td>
</tr>
<tr>
<td>Assessment B</td>
<td>1 session (1 hour)</td>
<td>Listening assessment</td>
<td>Listen to a lecture (computing/engineering)</td>
<td>Session 10.2</td>
<td>10%</td>
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</tbody>
</table>
### Standard Progression Criteria

For the purposes of PUIC this module carries a standard minimum progression requirement: [grade C* / pass mark 65%].

For Plymouth University this is a Pass/Fail zero credited module that the student must pass to progress into University Stage 2.

<table>
<thead>
<tr>
<th>Grade</th>
<th>Classification</th>
<th>Mark</th>
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<tbody>
<tr>
<td>A*</td>
<td>High Distinction</td>
<td>80% – 100%</td>
</tr>
<tr>
<td>B*</td>
<td>Distinction</td>
<td>70% - 79%</td>
</tr>
<tr>
<td>C*</td>
<td>Pass</td>
<td>65% - 69%</td>
</tr>
<tr>
<td>F</td>
<td>Fail</td>
<td>Less than 65%</td>
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</table>

### Bibliographic Resources

#### Essential Reading
- **Module Guide** – see MG ILS1005

#### Recommended Reading

#### Further Sources

#### Journals (general reading)
- Asian Journal of Communication
- Communication Education
- Journal of Communication
- Relevant computing/engineering/biological or biomedical/environment journals – supplied as focus by Instructor

### List

<table>
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<tr>
<th>Assessment C</th>
<th>Individual presentation</th>
<th>1 session</th>
<th>Presentation</th>
<th>Project presentation and defence</th>
<th>Session 11.2</th>
<th>20%</th>
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</thead>
<tbody>
<tr>
<td>Assessment D</td>
<td>Final Examination</td>
<td>Two (2) hour (closed-book) examination</td>
<td>Examination</td>
<td>Final summative examination covering academic reading and writing skills; history of scholarship and academic debate and critical analysis</td>
<td>Week 13</td>
<td>30%</td>
</tr>
</tbody>
</table>

**Total Weighting** 100%
14. Appendices

Teaching and learning methods and assessment strategies
Teaching strategies and assessment methodologies applied within the programme vary according to the different learning outcomes and specific module content. Assessment methodologies, in particular, are based upon the most recent pedagogic research and indications provided by UK-SPEC for assessing the competences and knowledge of chartered engineers.

Module delivery methods are diverse but are usually a mix of lectures, seminars, tutorials, laboratory sessions, research investigations and problem clinics. This delivery involves teams of academic, technical, support staff and students. To support learning, the University operates an electronic learning environment accessed via the student online learning environment. All students have dedicated accounts linked to this which forms the primary mechanism to arrange meetings with staff outside of programmed sessions. The campus is well equipped with computers and there are additional dedicated computer labs running specialist software to support this programme. Lecture and support materials are available via web access using the portal to facilitate home study and preparation for sessions.

Knowledge and understanding
Elements of teaching related to general and specific knowledge of engineering are mainly delivered by traditional in-class lectures. This traditional delivery method is always complemented by real and virtual laboratories, where students can experience and understand the theory through practice, as well as demonstrations and multimedia presentations. Plymouth University has a strong focus on electronic resources as a means for providing equal accessibility to knowledge. Therefore, the electronic resources already available on the market are often integrated by tailored material produced and made available to the students by the teaching staff in various forms, such as, lecture slides, podcasts, multimedia products and video-recorded lectures.

Lectures and presentations from visiting industrialists, practising engineers and representatives of professional groups are included in the delivery of some modules and some are open to students as extramural activities for added value. Knowledge related skills are usually assessed by a mix of practice-based elements and examination, which may take the form of formal exams or in-class tests. Inclusive strategies in support of disabled students are put in place as a complement of other forms of assessment.

Intellectual skills
Intellectual skills are fostered by the application of learning methods based on self-discovery and learning-by-doing, in which the responsibility for taking the initiative, self-reliance and self-discipline is given to the student. Students are introduced to conception, development, design, analysis and review of real solutions to engineering challenges. These activities are usually stimulated during interactive
sessions in labs and practical settings. Task-based and project-based teaching methods support the development of the necessary ability to apply theory and knowledge in practice and to widening the learning perspective of students in an integrative and comprehensive way, by favouring connections between specific engineering skills and other topics, such as market, legal, and ethical aspects. These skills are assessed through the robust defence of design decisions by means of viva voce and reports. Tasks and case studies based on problem solving and forward planning to make provision for professional challenges such as lead times, secondary sourcing, critical functions and creative alternative solutions are presented to the students.

Key and transferable skills
A range of student centred activities require students to work alone and in groups, focussing and researching topics, which are assessed through a variety of means including: viva voce, presentations, written reports, and an essay style dissertation. Sometimes the deliverables are in the form of design solutions underpinned by comprehensive mathematical analysis, or computer models of actual physical entities. Assessment not only includes the results obtained but also the methodology used and the means of presenting the results.

Projects in general, and particularly the Level 6 project, present opportunities for individuals to take a holistic view of a problem, set specific measureable and realistic goals within a strict timeframe.

As part of their personal and professional development, students are encouraged to take an optional placement year after the second year, during which they spend a full year in an industrial or research environment relevant to their study.

Practical skills
The teaching and learning strategy is based on a wide range of student centred activities involving hardware and software design and development which necessitate the full range of practical skills acquisition required by an engineer. The modules link theory and practice, with a high commitment to project work. From week 1 at the university, students select devices, construct, analyse and test analogue and digital circuits. This approach continues with increasing rigour as the programme progresses.

Students will use a wide range of devices to develop analogue and digital circuits and integrated embedded systems. Knowledge of what is available and how it may be applied is a fundamental part of the programme, together with the extensive use of a variety of circuits as teaching platforms for mathematics, electronics, mechatronics, and programming.

Students will write high and low level code and study good software engineering practice.
In level 4 general engineering skills are acquired through tasks with materials provided. In Level 5 and 6 the range and complexity of tasks increases and enlarges its breadth, further enhancing students’ familiarity with a host of skills and numerous disciplines related to Electrical and Electronic Engineering domain, such as renewable energy, communications and interfacing. This culminates with the Level 6 project showcase where students display innovative designs and compete for industrially sponsored prizes.