| PROGRAMME SPECIFICATION (Undergraduate) |  |
|---|---|

| | | |
|---|---|---|
| 1 | **Awarding Institution** | Newcastle University |
| 2 | **Teaching Institution** | Newcastle University |
| 3 | **Final Award** | BEng |
| 4 | **Programme Title** | Electrical and Electronic Engineering H607<br>Electrical and Electronic Engineering with Placement Year 1182U<br>Electrical and Electronic Engineering with International Study Year 1857U<br>Electrical Engineering Science (exit award) 1623U |
| 5 | **UCAS/Programme Code** | H607 |
| 6 | **Programme Accreditation** | Institute of Engineering Technology (IET) – H607 Only |
| 7 | **QAA Subject Benchmark(s)** | Engineering |
| 8 | **FHEQ Level** | 6 |
| 9 | **Last updated** | May 2025 |

**10 Programme Aims**

- To provide opportunities for students to undertake a broad-based education in electrical and electronic engineering and to acquire appropriate knowledge and understanding of engineering skills and key skills
- To produce graduates who will be equipped to enter employment in industry the professions or public service or to follow a postgraduate route into research industry or academia or apply the skills learnt in a range of areas other than engineering
- To produce graduates who will meet the accreditation requirements of the Institution of Engineering and Technology subject to the completion of matching studies.
- To provide a qualification which meets the designated learning outcomes at level 6 of the National Qualifications Framework and meets the requirements of the National Subject Benchmarks in Engineering.
- Provide in the later stages specialisation in an area of engineering to enhance their professional capability in their chosen field as demonstrated by a coherent group of specialist taught modules and a major individual project in the specified area:
- Electrical and Electronic Engineering: in contrast to the other named specialist streams below the later stages of this degree maintain the breadth of the earlier stages to produce graduates capable of developing into senior roles in which they may be required to understand and manage a broad spectrum of engineering activities.

For students on the Placement Year programmes:

- Provide students with the experience of seeking and securing a position with an employer.
- Facilitate independent self-management and proactive interaction in a non-university setting.
- Provide a period of practical work experience that will benefit current academic study and longer-term career plans.
- Enable students to ethically apply their knowledge and skills in the workplace reflect upon their development and effectively evidence and articulate their learning in relevant future settings.

For student on the International Study year:

- Offer students the opportunity to develop graduate attributes which increase employability, particularly communication and (where applicable) language skills,
- intercultural competencies, adaptability, resilience and global awareness.
- Gain insight into international Higher Education and experience differences in academic approach and learning environment.
- Provide the opportunity to experience new areas of study outside of their usual programme of study at Newcastle University.

**11 Learning Outcomes**

The programme provides opportunities for students to develop and demonstrate knowledge and understanding, qualities, skills and other attributes in the following areas. These are interpreted in the subject-specific form defined by the IET.

On completing the programme students should be able to:

C1. Apply knowledge of mathematics, statistics, natural science and engineering principles to the solution of complex problems. Some of the knowledge will be at the forefront of the particular subject of study.

C2. Analyse complex problems to reach substantiated conclusions using first principles of mathematics, statistics, natural science and engineering principles.

C3. Select and apply appropriate computational and analytical techniques to model complex problems, recognising the limitations of the techniques employed.

C4. Select and evaluate technical literature and other sources of information to address complex problems.

C5. Design solutions for complex problems that meet a combination of societal, user, business and customer needs as appropriate. This will involve consideration of applicable health & safety, diversity, inclusion, cultural, societal, environmental and commercial matters, codes of practice and industry standards.

C6. Apply an integrated or systems approach to the solution of complex problems.

C7. Evaluate the environmental and societal impact of solutions to complex problems and minimise adverse impacts.

C8. Identify and analyse ethical concerns and make reasoned ethical choices informed by professional codes of conduct.

C9. Use a risk management process to identify, evaluate and mitigate risks (the effects of uncertainty) associated with a particular project or activity.

C10. Adopt a holistic and proportionate approach to the mitigation of security risks.

C11. Adopt an inclusive approach to engineering practice and recognise the responsibilities, benefits and importance of supporting equality, diversity and inclusion.

C12. Use practical laboratory and workshop skills to investigate complex problems.

C13. Select and apply appropriate materials, equipment, engineering technologies and processes, recognising their limitations.

C14. Discuss the role of quality management systems and continuous improvement in the context of complex problems.

C15. Apply knowledge of engineering management principles, commercial context, project and change management, and relevant legal matters including intellectual property rights.

C16. Function effectively as an individual, and as a member or leader of a team.

C17. Communicate effectively on complex engineering matters with technical and non-technical audiences.

C18. Plan and record self-learning and development as the foundation for lifelong learning/CPD.

**Teaching and Learning Methods**

The primary means of imparting knowledge and understanding of fundamental mathematics science and engineering principles is lectures. These are supplemented by example classes and (in stage 1) by small group tutorials which enable students to check their learning. Practical lab work reinforces learning. Throughout the course students are encouraged to supplement taught material by independent reading for which they are given extensive support and guidance on reading materials and how to use them.

Awareness of new developments is acquired through examples in lectures and project work in the latter stages. Knowledge of other engineering disciplines is acquired through Engineering Mathematics which includes examples from a range of disciplines and through mechanical engineering and physics concepts covered in topics such as electrical machines and semiconductor devices. Mathematical and computer modelling skills are acquired through lectures and practical programming exercises in Matlab and C and through CAD tools in project work. Concepts in areas outside engineering are learned through lectures in accountancy and law and through project work.

Analytical skills are developed through worked examples in lectures and small group teaching (at stage 1) and solving tutorial problems. Mathematical and computer modelling is used in project work to solve engineering problems. Student are encouraged to learn a systems approach by applying principles taught in lectures to their project work. Knowledge of emerging technologies is imparted through lectures and students carry out investigations into aspects of these during literature studies and project work.

Design skills are learned from lectures and practised in project work and paper design exercises. Students are supported in developing creativity during project work.

Knowledge of management techniques and practices is imparted through lectures and practised through business exercises and project work. An understanding of ethical issues is imparted by lectures and developed through group discussions. Knowledge of social legal environmental and economic implications of engineering activities is imparted through lectures on engineering topics and on accountancy finance and law and business management. Students are encouraged to develop further awareness in project work particularly the group projects and industrial project.

Experimental skills are developed by carrying out laboratory experiments and constructing practical projects. Knowledge of materials products and processes is imparted through lectures and through open-ended project work. Students are encouraged to 'learn by doing'. An understanding of the industrial and commercial application of engineering practice and some practical limitations is achieved through open-ended project work including an industrial project. Students also learn how to use information sources such as technical literature (P4) during these projects. An awareness of intellectual property and contractual issues is also imparted through lectures in business management accountancy and law.

Project planning skills are developed through business exercises and practical project work. Knowledge of Communication and presentation skills is imparted through communications skills lectures and practised through report writing and giving oral presentations. Mathematical skills are developed throughout the course in lectures problem solving exercises and analysis of practical experimental work.

Team working skills are developed through group project work.

IT and communication technology skills are developed through the use of computer aided design and office software tools to produce coursework submissions.

Throughout the course the learner is encouraged to undertake independent reading both to supplement and consolidate what is being taught / learnt and to broaden their individual knowledge and understanding of the subject.

**Assessment Strategy**

Testing the knowledge base is through a combination of unseen written examinations and assessed coursework in the form of laboratory reports coursework reports project reports and presentations.

Analysis and problem-solving skills are assessed through written examinations and coursework and through project work which appears throughout the course.

Design skills are assessed through laboratory project reports assignments and dissertations presentations and written examinations.

Creative skills are mainly assessed through coursework and project work reports and presentations.

Knowledge of management techniques and practices is assessed by written examinations group project reports and business exercise reports. Understanding of ethical issues is not assessed directly. Knowledge of social legal environmental and economic implications of engineering activities is assessed by examinations project reports and business exercise reports.

Assessment of practical skills is through observed laboratory work laboratory and project report writing and assessed presentations and demonstrations. Skill is assessed directly by literature study report and by integration into project and laboratory reports. Understanding of industrial and commercial practice is assessed through industrial project presentation and report and through extended coursework.

## 12 Programme Curriculum, Structure and Features

### Basic structure of the programme

Stages 1 and 2 are broadly-based and common to all BEng and MEng Honours streams with all modules compulsory.

Stage 1 aims to provide all students with a firm foundation on which to build their future studies. A substantial mathematical base is provided and is enhanced by mathematical techniques and practice introduced in other modules. Knowledge and understanding of fundamental engineering principles is provided through the technical modules which also serve to broaden and enhance intellectual abilities. Practical work in the laboratory emphasises a project-based approach this together with computing classes develops a range of practical and transferable skills.

Stage 2 builds on the work of Stage 1 continuing the development of an understanding of mathematical methods at the point of application. Knowledge and understanding is increased through all modules. Project work again forms a major part of the practical work of the stage. In Stage 2 all students take part in a group project which develops and exercises practical and teamwork skills as well as enhancing intellectual abilities. Work on Project Management provides an understanding of the requirements of the management of engineering programmes. This work is practised and assessed as part of the group project.

Stage 3 continues to enhance and expand the student's knowledge understanding and intellectual abilities. However, it is distinct from Stages 1 and 2 where almost all modules are compulsory as the student will now specialise in particular aspects of electrical and electronic engineering and additionally study a small number of options selected freely from a wider range of topics though some appropriate modules are recommended. (except for the Electrical and Electronic stream which remains broad-based and most taught modules are optional).

All students take a module covering commercial and legal aspects of engineering to further their understanding of commercial engineering practice. A major part of Stage 3 is

the individual student project which is a significant part of the training of a professional engineer. This project enables the development of intellectual ability and practical and transferable skills as well as providing a mechanism for their assessment.

Students on the Careers Placement Year or International Study Year programmes will take their placement in the penultimate year of studies.

**Key features of the programme (including what makes the programme distinctive)**

The normal Undergraduate year is arranged in three terms and is divided into two Semesters. Semester 1 is twelve weeks preceded by an induction week and followed by a period of examination for those topics completed in Semester 1. Semester 2 is also twelve weeks long and is followed by a second examination period

The course normally lasts three years although it is possible to take a gap year.

Every Honours student studies 120 credits in each Stage (or year) resulting in BEng candidates completing 360 credits by the end of their course. Candidates must successfully complete all parts of a stage before progressing to the next. Courses are pursued through full-time study; the only part-time study is limited provision for the repetition of failed modules.

All students follow the same programmes in Stages 1 and 2 and 3. In the third years students follow a pathway/stream. The MEng and BEng versions of the programme are common up to the end of Stage 3 and it is possible for students to transfer between courses (subject to conditions) up to this point.

**Programme regulations (link to on-line version)**

H607 1182U 1857U, 1623U

## 13 Support for Student Learning

Generic information regarding University provision is available at the following link.

Generic Information

## 14 Methods for evaluating and improving the quality and standards of teaching and learning

Generic information regarding University provision is available at the following link.

Generic Information

*Accreditation reports*

Institute of Engineering Technology (IET) – H607 Only - This programme is accredited by the Institute of Engineering and Technology (IET)

*Additional mechanisms*

| |
|---|

| **15 Regulation of assessment** |
|---|
| Generic information regarding University provision is available at the following link.<br><br>Generic Information |

| In addition, information relating to the programme is provided in: |
|---|
| The University Prospectus: http://www.ncl.ac.uk/undergraduate/degrees/#subject<br><br>Degree Programme and University Regulations: http://www.ncl.ac.uk/regulations/ |

| Please note. This specification provides a concise summary of the main features of the programme and of the learning outcomes that a typical student might reasonably be expected to achieve if she/he takes full advantage of the learning opportunities provided. |
|---|