Programme Specification

SECTION A: CORE INFORMATION

1. Name of programme: Electronic and Electrical Engineering Practice
2. Award title: BEng
3. Programme linkage: Is this part of group of linked programmes between which students can transfer at agreed points? No
4. Is the programme a top-up only? No
5. Does the programme have a Foundation Year (Level 3) associated with it so that students enter for a four-year programme and progress directly from the Foundation Year to Stage 1 without having to re-apply? No
6. Level of award: Level 6
7. Awarding Body: University of Sunderland
8. Department: School of Engineering
9. Programme Studies Board: Undergraduate Engineering
10. Programme Leader: ???
11. How and where can I study the programme?

### At Sunderland:
- Full-time on campus ✓
- Part-time on campus ✓
- As work-based learning full-time ✓
- As work-based learning part-time ✓
- As a full-time sandwich course
- As a part-time sandwich course
- By distance learning

### At the University of Sunderland London campus:
- Full-time on campus
- Part-time on campus
- As work-based learning full-time
- As work-based learning part-time
- As a full-time sandwich course
- As a part-time sandwich course
- By distance learning

### At a partner college:
- Full-time in the UK
- Part-time in the UK
- Full-time overseas
- Part-time overseas
- By distance learning
- As a full-time sandwich course in the UK
- As a part-time sandwich course in the UK
- As a full-time sandwich course overseas
- As a part-time sandwich course overseas
- As work-based learning full-time in the UK
- As work-based learning part-time overseas
- Other (please specify)

Entry to these degree apprenticeship programmes is restricted to appropriately qualified employees of Engineering Degree Apprenticeship partner companies. Over the course of their academic programmes they will spend approximately 80% of their time in the workplace and 20% as students at the University.

12. How long does the programme take?

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<th>Min number of years / months</th>
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For start-dates please see the current edition of the Prospectus or contact the relevant department at the University. For start-dates for programmes delivered in a partner college, please contact the relevant college.

SECTION B: FURTHER CORE INFORMATION

26. Learning and teaching strategy.

The programme team designed this programme to specifically align with the University's Learning and Teaching Plan, the University's guidance on work-based learning, the QAA's Foundation Degree Characteristics, the expectations embedded within the automotive suite of Engineering Degree Apprenticeships, and the QAA's Engineering Subject Benchmark Statement. In addition, the team was cognisant that all students recruited will be in full-time employment with regional engineering businesses, and released to study at the University for 20% of their time (typically for one day each week).

These policies and characteristics informed the adoption of a number of key principles for learning and teaching:

- All students will spend 80% of their time in a rich, vocational learning environment; their place of work. This will provide a vehicle from which to bring experience to the classroom, and also in which to apply principles and practice gleaned at University. Work-based learning is integral to, and permeates the students' entire apprenticeship.
- The programmes will support students in their transitions between work and study as part of the wider apprenticeship package and help them balance the needs of each as necessary.
- The VLE will be exploited to the maximum in order to support the students throughout the full five years of their apprenticeship, providing access to staff, other students and resources from work and home in addition to their time in University.
- Students will be able to exploit inter-professional learning by drawing upon the professional experience of both staff and their peer students.
- Enable students to develop academic and professional skills both within the curriculum and through work-place opportunities.
- Students will be encouraged to ‘learn by doing’. The curriculum will contain a strong thread of case-study, problem-, project- and practice-based reflection and learning. Each module will typically include at least one mini-case-study. Students will receive case material in advance of classes, will prepare for the session, will seek examples in their work place, and then influence the classroom interaction as they address the problems posed by staff.
- Case studies and practical exercises will be used on occasion to solely lead students through their learning and, on other occasion also as a vehicle for assessment.
- Provide opportunities to develop critical thinking by applying a range of validation, analysis and interpretation tools in order to develop solutions to realistic engineering problems.
- Create clarity, integration and alignment between lectures, practical activities, seminars, tutorials, work-based learning and assessment.

The Virtual Learning Environment (VLE):

The degree apprenticeship is an holistic experience with three key themes; application of engineering skills; learning in the professional workplace; and reading for an engineering degree. Whilst this programme is not designed as a blended programme in the traditional sense, the VLE will be essential to ‘blending’ the three themed experiences together for the students, and for ‘blending’ the students together into a cohesive group. The intention is that the VLE becomes the
‘Go To’ place for students to find information about the whole of their apprenticeship, as well as the details of this programme and the individual modules within it.

Having consulted with other degree apprenticeship providers, the programme team has learned that the apprentices value the time out of the workplace, and welcome a physical learning experience with staff. Online learning approaches have not been well-received. The team therefore believes that it is essential for the students to come together at the University for face-to-face support and learning. In order to maximize the value of the face-to-face time in the classroom, the intention is for much of the learning to take place through two-way classroom problem-solving experiences; a ‘dialogic’ rather than didactic engagement, the students having prepared for the class beforehand. Thus it is essential for the learning materials to have been made readily available on the VLE. It is also anticipated that the discussion board/conversation facility of the VLE will be particularly valuable to these physically dispersed and part-time student groups.

The team has thus agreed a baseline expectation for the VLE. Each module will have its own site, and staff will make appropriate teaching material available at least one week in advance of timetabled classes. Each site facilitate virtual communication to support student during their time away from the classroom. It is anticipated that engagement will principally take place in the classroom, but that does not exclude the use of the VLE for interactive formative and summative assessment activities. Coursework will generally be submitted through the VLE, although the students’ industrial learning logs (see below for details) will clearly be submitted and assessed physically.

Work-based learning
The model adopted for this degree apprenticeship is predicated upon a partnership between the University and a number of both large and small employers within the region. This necessarily means that the students’ industrial experience will not be identical, although will provide equivalence of opportunity for learning. It does, however, also bring huge advantage in that the entire cohort will be able to share in the range of approaches from different-sized and sector organisations.

Students will generally attend the University on a day-release basis, returning to work for the rest of the week. Student groups will simply not exist in every company, and thus the work- and group-based elements of the programme will need an adaptive approach.

The approach adopted in the programme will be coordinated by the programme leader, and exploits a range of exciting opportunities, including:

- Each employer will be asked to ‘host’ ‘cohort visits’. Students will, where possible, be tasked to organise a day of visit/experience to their own company for the whole cohort (or smaller group). The visits will have clear learning objectives drawn from the various modules, and students will maintain a learning log/portfolio throughout (see below). Students would average a visit approximately every six weeks.
- The level 5 and level 6 student project work will be based in the workplace.
- There will be opportunities for some projects to be team-based, with teams formed from different companies, but delivering for just one. These might possibly be delivered in ‘block release’ from work to the hosting company.
- Elements of assessment in a number of modules per stage will be case-studies, based in the workplace, hence bringing a strong ‘commercial’ sightline into the curriculum.
- Companies will provide mentors for their apprentices. Mentors will be members of a wider, cross-apprenticeship team, will meet regularly and be coordinated by the Faculty.
• The University will provide a Professional Skills Tutor who will be responsible for visiting the student in the workplace and holding a tripartite meeting with the mentor and the student to discuss and support the student’s wider development as an apprentice.

• Students will use a directed and structured learning log/ portfolio/ task book to record their work-based learning. Activities, learning points and evidence will all be recorded, and verified by their mentor. The log will address, inter alia, HR policies, commercial engineering experience, company finance, project funding, staff development, appraisal, as well as lessons identified within the managed visits to other companies in the apprenticeship network. Learning logs will be assessed by Professional Skills tutors, in conjunction with the student’s mentor.

• Students will develop case-studies based on ‘real-life’ problem solving in their own organisation. This is aimed to move them out of their comfort zone in their own department, to talk to colleagues in various other departments, to identify aspects that had been presenting problems, tease out how they had been solved, and to present the problem and solution to their fellow students (this will expose the entire cohort to a range of business, commercial, HR, and technical cases)

• Participating companies will provide a range of specialist guest speakers who will provide keynote contributions to modules at the University. In some cases, the keynote contributions may be delivered to the entire cohort at the company, enabling access to proprietary technical equipment for demonstrations.

• For the stage 2 group project (EDA208) students undertake a significant piece of group work based on a relevant system or process in the workplace. Each group will be allocated an academic supervisor. Furthermore, companies will provide industrial supervisors with specific knowledge of the area/systems/processes on which the project is based. The industrial supervisors will work in partnership with the academic supervisors throughout the project. The industrial supervisor will provide input to the assessment process, all the summative assessment will be undertaken by the academic supervisor.

• Companies will provide industrial supervisors for stage 3 projects with specific knowledge of the area/systems/processes on which the project is based. The industrial supervisors will work in partnership with the academic supervisors throughout the project. The industrial supervisor will provide input to the assessment process, all the summative assessment will be undertaken by the academic supervisor.

• The opportunities for the University and participating employers to collaborate in joint research and development will contribute to an increase in technology transfer opportunities, and will provide greater synergy between the curriculum and the workplace.

• Companies are likely to donate/lend/provide access to technical equipment/preferred brands to use as practical teaching aids at the University.

Company mentors will be an essential element in supporting the student. The programme leader will join the mentor for the student’s induction to the apprenticeship, in order to brief students on the academic aspects of their programme. Students and mentors will have access to an online portal from that point onwards. Mentors will monitor and appraise the apprentices in the workplace, and throughout the three stages of academic study, the mentors will oversee and validate the development of the student’s learning log. They will support students arranging to host ‘cohort visits’ to their company. They will work with tutors when the latter are assessing the learning log, both in PPS and other modules. They will assist the programme team in arranging for specialist professional engineers to give guest talks to the students. In essence they will form the conduit between the company and the University during the academic stages of the apprenticeship.

Approaches to learning and teaching
At all stages we expect to provide a learning environment, in the workplace and in the University, in which students actively engage in a dialogue with their mentors, their teaching staff and their student peers. They will all work together as partners to make a rich and rewarding learning experience. ‘Learning through doing’ (case-study, problem-, project- and practice-based reflection and learning)
will permeate all modules, assuming greater proportions as students progress through the programme.

The approaches adopted in each stage are discussed with greater granularity in section 32.

27. Retention strategy.

Students will be allocated a personal tutor for both pastoral and academic support by the University and will additionally have a work based mentor. Students will be expected to meet regularly with their work-based mentor and give updates on their progress on the programme of study. Throughout all academic stages, students will also be in regular contact with their personal tutor and module tutors.

The nature of a degree apprenticeship does however, bring a new perspective on retention. Students may not enrol upon, or remain enrolled upon the constituent degree programmes, if they are not both employed full time by an apprenticeship employer and also registered on the degree apprenticeship programme. As degree apprentices, they are required, as a condition of employment, to fully engage in the academic, competence and work-related aspects of the scheme. In short, the students will be motivated to properly engage with their studies; failure to progress successfully within the degree programmes will automatically result in the loss of their apprenticeship and thus jeopardise their registration on the programme. It is thus anticipated that students will be motivated to fully engage with their learning by the dialogic approach to learning, where the students are treated as committed partners in their own learning, and bringing to the class their personal experiences in the ‘wider classroom’ that is their workplace.

The team will additionally build on their experience within the University’s range of accredited engineering degree programmes. The assessment in most modules is spread throughout the delivery period, bringing the advantage that students will engage with the material from an early stage and receive correspondingly early feedback on their academic performance. This strategy has proved very successful.

28. Any other information.

A number of key national policies, position statements and standards have intimately informed the development of this programme; the relevant details are embedded in the narrative. The links below will take the reader to the various documents for further contextual background:

Apprenticeship Standards
https://www.instituteforapprenticeships.org/apprenticeship-standards/

QAA Interim Statement on Degree Apprenticeships
(http://www.qaa.ac.uk/en/Publications/Documents/Interim-statement-on-Degree-Apprenticeships.pdf)

The UK Standard for Professional Engineering Competence

Engineering Council Accreditation of Higher Education Programmes (AHEP)
SECTION C: TEACHING AND LEARNING

29. What is the programme about?

The programme forms the academic element of an Engineering Degree Apprenticeship. It has thus been designed to align with the aims and outcomes defined within the Electrical/Electrical Technical Support Engineer Degree Apprenticeship Standard.

The programme develops scientific and mathematical principles that equip graduates with the understanding required to operate effectively at a high level within the engineering sector. They will be able to apply and adopt a range of appropriate theory, tools and techniques, transferable and professional skills in order to scope, plan, manage and deliver real engineering projects.

Technical knowledge and analytical skills are contextualised with manufacturing applications, and students develop commercial awareness and practice applying their knowledge and skills to business advantage.

Graduating students will have a solid grasp of engineering mathematics, science and materials; computer-aided design and engineering; electrical and electronic principles; electronic devices, actuators, sensors and applications; digital electronics and microprocessors; product development, manufacturing and project management.

30. What will I know or be able to do at each Stage of the programme?

Learning Outcomes Stage 1 – Skills
By the end of this Stage of the programme successful students will be able to:

S1 Demonstrate basic competence in mathematical modelling of simple engineering systems.
S2 Apply engineering principles to engineering practice in the laboratory and work place
S3 Use appropriate software to assist in basic analysis, communication and design methodologies

Learning Outcomes Stage 1 – Knowledge
By the end of this Stage of the programme successful students will demonstrate:

K1 Basic knowledge of engineering mathematics including calculus.
K2 Basic knowledge of mechanical, electrical and design engineering principles, instrumentation, manufacturing technology, processes and materials.
K3 Knowledge of the basic processes involved in conducting and reporting a simple engineering project.
K4 Appreciation of environmental issues as they impinge upon engineering activity.
Learning Outcomes Stage 2 – Skills
By the end of this Stage of the programme successful students will be able to:

S4 Evaluate electrical and electronic systems.
S5 Develop basic instrumentation and control systems.
S6 Apply appropriate analysis techniques to signals and systems.
S7 Work with others in order to use appropriate design methods to integrate theory and implement solutions to engineering problems.
S8 Communicate engineering concepts and ideas verbally, in writing and using visual and digital media.
S9 Use and apply information from technical literature including appropriate codes of practice and industry standards.

Learning Outcomes Stage 2 – Knowledge
By the end of this Stage of the programme successful students will demonstrate:

K5 Critical knowledge of analogue and digital electronics; electrical power and drives; and automation and manufacturing processes.
K6 Working knowledge of process innovation in the manufacturing industry.
K7 Working knowledge of programming in a manufacturing engineering context
K8 Applied knowledge of processes and techniques for scoping, planning and implementing an engineering project.

Learning Outcomes Stage 3 – Skills
By the end of this Stage of the programme successful students will be able to:

S10 Compile, manipulate and interpret financial information and use to inform commercial engineering decisions.
S11 Evaluate and select suitable materials and manufacturing processes on the basis of given requirements.
S12 Manage tasks efficiently, solve problems and demonstrate initiative, creativity and financial awareness.
S13 Undertake major projects of a practical investigative nature, applying a well-developed, sound experimental technique.
S14 Critically appraise and effectively report the outcome of a project.

S15 Establish good working relationships with others, manage people and work effectively as a group member.

S16 Evaluate and propose efficiency and enhancement strategies for manufacturing industry.

S17 Design, create and critically evaluate products, processes and/or devices for use in the industrial environment.

**Learning Outcomes Stage 3 – Knowledge**

By the end of this Stage of the programme successful students will demonstrate:

K9 Expert knowledge of an area of engineering evidenced in the form of an independent project.

K10 Critical knowledge of change management activities within the engineering discipline.

K11 Understanding of the wider multidisciplinary aspects of engineering with respect to manufacturing technologies and approaches to design.

K12 Understanding of the regulatory, legal and environmental constraints within which commerce and industry operate and the management techniques which may be used to achieve engineering objectives within this context.

K13 Critical understanding of specialist industrial engineering topics and principles to support a competent application of knowledge within the manufacturing sector.

**Learning Outcomes – Ordinary degree**

If you are awarded an Ordinary degree you will have achieved the majority of the learning outcomes for the programme studied. However you will have gained fewer credits at Stage 3 than students awarded an Honours degree, your knowledge will typically be less broad and you will typically be less proficient in higher-level skills such as independent learning.

31. What will the programme consist of?

Each undergraduate programme consists of a number of Stages from a minimum of 1 to a maximum of 4, each of which is equivalent to a year’s full-time study. The summary below describes briefly what is contained in each Stage. Most programmes have a mixture of core (i.e. compulsory) modules and optional ones, often with increasing choice as you move through the programme and gain in experience. In some programmes the choice of optional modules gives you particular ‘routes’ through the programme. The programme structure including a detailed list of modules can be found in the programme regulations.

In each stage of study, just over half the modules in each programme are common with the other linked routes. The common modules bring a foundation of common engineering and mathematical principles; a theme through each stage of personal and professional skill development; a project
theme in all stages, generally based in the workplace; and finally a look forward at how the engineering profession is developing, addressing amongst other matters, themes such as sustainability and efficiency.

Stage 1

Stage 1 is entirely common for all routes; Manufacturing Engineering Practice, Electronic and Electrical Engineering Practice, and Design Engineering Practice. It introduces mathematical, electrical and mechanical, manufacturing and design principles; develops a common approach to basic engineering instrumentation and develops students’ skills in data analysis; and develops basic professional engineering skills using a group-based design-and-build project as the vehicle. Students will apply the principles developed in the programme during their employment, and will also routinely bring their experience and observations from work into the classroom.

The modules studied at this stage are:

- **EDA101 Engineering Mathematics and Statistics.** Numeracy, Algebra and Algebraic Manipulation, Complex Numbers, Logarithms and Trigonometry, Calculus and Differential Equations, Statistics and Manufacturing Applications
- **EDA103 Materials and Manufacturing Principles.** Properties of Engineering Materials, Overview of Manufacturing Processes, Traditional Manufacturing Methods, Applications and Limitations, Non Traditional Manufacturing Methods, Applications and Limitations, Ethical and Environmental Issues.
- **EDA104 Design Principles.** Engineering Drawing and Computer Aided Design (CAD), Creative Design Methodology.
- **EDA105 Instrumentation and Data Analysis.** Sensors and Measurement Technology, Microprocessors and Microcontrollers, Data Analysis.

Stage 2
Stage 2 establishes an understanding of change and innovation in the manufacturing industry, builds upon the stage 1 introductory project by introducing a specific focus upon both individual and group professional skill development, and applies those skills in a work-based group project. Students on this Electrical and Electronic Engineering Practice Degree also explore the applications of electrical and electronic systems in the industrial environment, and focus in particular on industrial automation, the application of computing power within the manufacturing sector to monitor and control plant in real time. Students will apply the principles developed in the programme during their employment, and will also routinely bring their experience and observations from work into the classroom.

The modules studied at this stage are:

- **EDA201 Manufacturing Process Innovation.** Ideation, Innovation, Incubation, Approaches and Methods
- **EDA202 Industrial Automation.** Automation Building Blocks, PLCs, Actuators, Programming Approaches, SCADA.
- **EDA204 Electrical and Electronic Systems.** Electrical Power, Machines and Drives, Instrumentation and Sensors, Control Systems.
- **EDA207 Personal and Professional Skills 1.** Knowledge and Understanding of Engineering Principles and Practice, Communication Skills, Teamwork and Leadership, Research Methods.

**Stage 3**

Stage 3 evaluates the emerging political, environmental and commercial drivers for change in the engineering industry, and explores the changes that these are likely to bring to the manufacturing sector. Developments in students’ professional skills will focus upon enhancing their ability to contribute fully to their business within, around and outwith the specific context of their technical role. Each student will undertake a significant individual project based in their place of work. Students on the electrical and electronic degree apprenticeship also investigate the nature of the supply of electrical energy to industry, the nature of electrical drives associated with manufacturing industry, and further explore the applications of electronic systems in the industrial environment. Students will apply the principles developed in the programme during their employment, and will also routinely bring their experience and observations from work into the classroom.

The modules studied at this stage are:

- **EDA301 Engineering Enhancement.** Practical, Commercial and Professional Considerations and Processes involved in Enhancing the Efficiency and Productivity of Engineering Processes.


32. How will I be taught?

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<th>Scheduled teaching activities</th>
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<td>Project work</td>
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<td>Problem- and practice-based experiential learning</td>
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<th>Independent study</th>
<th>Laboratory practical exercises</th>
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<td>Workshops</td>
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<th>Placement</th>
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<td>Industrial visits</td>
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<td>Development of case studies</td>
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At all stages we expect to provide a learning environment, in the workplace and in the University, in which students actively engage in a dialogue with their mentors, their teaching staff and their student peers. They will all work together as partners to make a rich and rewarding learning experience. ‘Learning through doing’ (case-study, problem-, project- and practice-based reflection and learning) will permeate all modules, assuming greater proportions as students progress through the programme.

Stage 1 of the programme is common to all programmes in the apprenticeship scheme, and is typified by the development of fundamental knowledge of engineering and scientific principles. There will be elements of traditional didactic activity in the key principles modules, although most contain aspects of practice-based learning, drawing upon experience in the laboratories and from the
workplace. The Instrumentation and Project modules are both problem- and group-based, with very little didactic material.

Stage 2 moves the students from principles to their applications in the design, manufacturing and electrical/electronic engineering sectors. Modules typically address practical technical processes and challenges, and introduce the human and commercial constraints encountered in manufacturing industries. All modules will include case-study, problem-, project- or practice-based reflection and learning. Students will be required to bring mini-case-studies from the work place as examples or for discussion. Personal and Professional Skills 1 will drive a series of industry visits, all hosted by students and their mentors, focusing upon aspects of the business pertinent to stage 2 modules, and recorded for assessment in the students’ learning logs. The level 5 group project will be based in the workplace, providing net benefit to the employer, supported by both an industrial supervisor and a University Academic Supervisor. It is expected that some employers will wish to collaborate, with teams formed of apprentices from several different companies. In this manner, apprentices from focused, niche companies will be able to expose their apprentices to practice in the wider sector.

Stage 3 takes the students into the development of engineering solutions, permitting them to exercise their creativity and imagination in addressing practical challenges. Thus Engineering Enhancement will require students to address the ever-present commercial demand for increased efficiency. The discipline-specific modules will develop practical familiarity with industry-standard equipment and practices, whilst exploring various approaches to design, drawing upon various principles and applications examined in stages 1 and 2. Personal and Professional Skills 2 will operate a programme of industry visits, with groups developing a series of mini-case-studies of cutting edge technology and practice, which will be shared with other students. The level 6 project will be work-based.

A list of the modules in each Stage of the programme can be found in the Programme Regulations.

A summary of the types of teaching, learning and assessment in each module of the programme can be found in the Matrix of Modes of Teaching.

33. How will I be assessed and given feedback?

| Written examinations | ✓ |
| Coursework           | ✓ |
| Practical assessments | ✓ |

A summary of the types of teaching, learning and assessment in each module of the programme can be found in the Matrix of Modes of Teaching.

The generic assessment criteria which we use can be found here. Some programmes use subject-specific assessment criteria which are based on the generic ones.

| This programme uses the Generic University Assessment Criteria | YES | NO |
| This programme uses the Subject Specific Assessment Criteria  | YES | NO |

The University regulations can be found here.
The subject benchmark statements emphasise the individual graduate’s responsibility to exercise personal engineering judgement, and so the team has included a proportion of individual time-constrained assessments. The majority of coursework assessment will have a work-based focus, and some will be group-based.

The majority of modules adopt a 50/50 Examination/Coursework balance, but where justified (for example in individual project work, design exercises etc), the balance shifts to give greater focus upon the coursework or examination as best suits the subject matter.

Formative assessment will be used routinely in class-based activities, including, for example, interaction in class; peer feedback; workshop activity; and presentations on work-based activity. The output for work-based projects will be agreed between the learner, the mentor and the academic supervisor. This allows the employer to align and exploit the outcomes to maximise the utility to the business.

The programme team acknowledges that learning can be driven by assessment and the assessment strategy reflects this link. Assessments are therefore arranged to ensure that the key learning goals of the modules are covered.

In setting assignments care will be taken to ensure that they can be can be completed within the learning time associated with the module and module/programme leaders will counsel students on the importance of time management. To assist with this, assignments will normally include guidance as to the amount of time to be expended and the nature of the required outcomes.

Students are also expected to develop core transferable skills in addition to technical understanding and abilities; assessments are in place to encourage this development. For example, presentations form an integral part of the assessment of a number of the modules and especially the various projects within the programme. Presentations are also employed to evaluate progression through a task (eg in the first year introductory project), but do not necessarily form part of the assessment regime. Students are required to participate in seminars and group work, developing communication and interactive skills, and undertake case studies requiring information search skills. In all of these activities they will be encouraged to use IT skills for gathering, analysing and presenting information. Exposure to this wide range of learning opportunities is reflected in the wide range of methods used to assess the learning outcomes for each module as students’ capabilities in these various activities form a component of the assessment for many of the modules.

The programme team makes extensive use of the University Virtual Learning Environment, to deliver assessments and provide feedback. This has elsewhere proved to be a very useful strategy in promoting prompt, clear and detailed feedback on assignments submitted and in addition provides useful ‘back up’ copies of marked student work.

The University aims to return marked assessments and feedback within 4 working weeks of the assignment submission date after internal moderation processes have been completed. If this is not possible, students will be notified by the Module Leaders when the feedback is available and how it can be obtained.

The Academic Misconduct Regulations and associated guidance can be found here. It is the responsibility of students to ensure they are familiar with their responsibilities in regards to assessments and the implications of an allegation of academic misconduct.

Students should refer to the University Regulations for information on degree classifications and compensation between modules.
### 34. Teaching, learning and assessment matrix

#### Stage 1

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<tr>
<th>Module</th>
<th>Code</th>
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<td>and Statistics</td>
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<td>End of module exam</td>
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<tr>
<td>Electrical and Mechanical</td>
<td>EDA102</td>
<td>Core</td>
<td>Lecture, Tutorials, Guided, Supervised Laboratory Sessions,</td>
<td>CW – Laboratory Work</td>
<td>D</td>
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<td>D</td>
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<td>Principles</td>
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<td>End of module exam</td>
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<tr>
<td>Materials and Manufacturing</td>
<td>EDA103</td>
<td>Core</td>
<td>Lecture, Tutorials, Guided, Supervised Laboratory Sessions,</td>
<td>CW – Laboratory Work</td>
<td>D</td>
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<tr>
<td>Design Principles</td>
<td>EDA104</td>
<td>Core</td>
<td>Lecture, Tutorials, Practical Drawing</td>
<td>CW – Design exercise</td>
<td>D</td>
<td>T</td>
<td>D</td>
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<td>Instrumentation and Data</td>
<td>EDA105</td>
<td>Core</td>
<td>Lecture, Tutorials, Practical work in laboratory,</td>
<td>CW – Mini-presentation</td>
<td>D</td>
<td>T</td>
<td>D</td>
<td>D</td>
<td>D</td>
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<td>Analysis</td>
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<td>CW – Practical design exercise</td>
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<td>CW – Data manipulation and display</td>
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<tr>
<td>Introductory Project</td>
<td>EDA106</td>
<td>Core</td>
<td>Lectures, seminars, Practical work in laboratory or workshop</td>
<td>CW – Presentation</td>
<td>D</td>
<td>T</td>
<td>D</td>
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<td>A</td>
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<td>CW – Reflection and report</td>
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<td>CW – Project and report</td>
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## Stage 2

<table>
<thead>
<tr>
<th>Module</th>
<th>Code</th>
<th>Core / optional</th>
<th>Modes of T&amp;L</th>
<th>Modes of Assessment</th>
<th>LO K5</th>
<th>LO K6</th>
<th>LO K7</th>
<th>LO S4</th>
<th>LO S5</th>
<th>LO S6</th>
<th>LO S7</th>
<th>LO S8</th>
<th>LO S9</th>
</tr>
</thead>
</table>
| Manufacturing Process Innovation         | EDA201 | Core            | Lecture, Tutorials, Guided independent study                               | CW – Process case study
End of module exam                                                                       | T     | D     | A     |       |       |       |       |       |       |
| Industrial Automation                    | EDA202 | Core            | Lecture, Tutorials, Laboratory Sessions, Guided independent study using material provided via the VLE prior to each classroom session | CW – Presentation and Research Review
CW – Design exercise                                                                 | T     | D     | A     | D     | D     | D     | D     | D     | T     |
| Electrical and Electronic Systems        | EDA204 | Core            | Lecture, Tutorials, Laboratory Sessions, Guided independent study using material provided via the VLE prior to each classroom session | CW – Group presentation and executive summary
CW – Practical design exercise
End of module exam                                                                       | T     | D     | A     | D     | D     | D     | T     | D     | A     |
| Personal and Professional Skills 1       | EDA207 | Core            | Seminars, in class assessments, Keynote presentations using internal and external specialist speakers, Personal Tuition, Programme of Industrial visits, Guided learning delivered via the VLE | CW - Portfolio of evidence mapped against learning outcomes | D     | T     | D     | T     | D     | D     | T     | T     |
| Group Project                            | EDA208 | Core            | Introductory Lecture, Tutorials, Group supervision, | CW – Project plan
CW – Risk assessment
CW – Project report
CW – Presentation/viva | D     | D     | A     | D     | D     | D     | D     | D     | D     |
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<tbody>
<tr>
<td>Engineering Enhancement</td>
<td>EDA201</td>
<td>Core</td>
<td>Lecture, Tutorials, Guided, independent study based on given case studies,</td>
<td>CW - Phased coursework exercise resulting in written reports and presentations at specified waypoints.</td>
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<td>T</td>
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<tr>
<td>Industrial Electronic Systems</td>
<td>EDA305</td>
<td>Core</td>
<td>Lecture / Tutorials Guided independent study using material provided via the VLE prior to each classroom session</td>
<td>CW – Laboratory Work End of module exam</td>
<td>D</td>
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<tr>
<td>Electrical Power Systems</td>
<td>EDA302</td>
<td>Core</td>
<td>Lectures and in-class seminars/ tutorials, Practical and case-led exercises in laboratory, Guided independent study using material provided via the VLE prior to each classroom session.</td>
<td>CW – Phased Coursework Exercise End of module exam</td>
<td>T</td>
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<tr>
<td>Personal and Professional Skills 2</td>
<td>EDA308</td>
<td>Core</td>
<td>Keynote presentations using internal and external specialist speakers, Seminars/ in class assessments, Laboratories/ workshops/ in class assessments, Programme of Industrial visits.</td>
<td>CW - Portfolio of evidence mapped against learning outcomes</td>
<td>D</td>
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35. How does research influence the programme?

Many of the academic staff teaching on the programme are research active, and contribute to a leading group in international research in automotive, manufacturing and maintenance engineering. This informs the teaching on and the development of the modules on the programme particularly in the areas of, for example, lightweight materials, crash dynamics, control engineering, and maintenance. In addition, AMAP (Automotive and Manufacturing Advanced Practice) forms a proactive vehicle between the Faculty and regional industry for technology transfer, providing support for industry drawing upon staff research and knowledge of advanced manufacturing. Recognised regionally, nationally and internationally, the relationships that staff build with industry develop experience of cutting edge applications, thus adding unique value and excellence which differentiates and enhances the student experience.

Structured approaches to research are introduced in Stage 1 of the programme, with a structured and supported approach to the Level 4 Introductory Project. Students undertake a small scale design and build project which requires them to engage in small scale research to determine critical data for the successful completion of the design aspect of the project. In the Level 4 Instrumentation and Data Analysis module, students research the principles of operation of sensors found in their place of work.

This approach is further developed through the Level 5 Personal and Professional Skills Module and the Level 5 Group Project, and the concept of work-initiated research continues in a number of the technical modules. These skills are further developed in Stage 3 of the programme through the Engineering Enhancement Module, the Personal and Professional Skills Module, and the Individual Project, in which students undertake a literature review and critically appraise the data they have gleaned from the literature.

SECTION D: EMPLOYABILITY

36. How will the programme prepare me for employment?

The programme gives you the opportunity to develop skills which you can use in the future. Some skills are more specific than others to the subject area, or to a particular type of activity, but all skills can be applied in a range of employment situations, sometimes in quite unexpected ways. The skills which this programme is designed to develop are listed below.

The Faculty always includes employers in the development of new degree programmes, and this has been particularly important in this case. The framework for the engineering degree apprenticeship has been designed and approved nationally, led by representatives from the automotive sector in particular and the engineering sector in general. Detailed curriculum content is the responsibility of the University, and numerous regional employers have been engaged in a series of consultative fora and more detailed one-to-one planning meetings. Not only have these meetings identified a range of employers who are likely to join the apprenticeship network/consortium, but they have increased the opportunities to work closely with employers to ensure that the programme will meet their requirements and will provide appropriate study models to guarantee work-based opportunities for learning.
All students enrolled upon this programme will already be in gainful engineering employment; students will spend approximately 80% of their working time working for their employer, and on completion of their degree, are assured continuing employment. However, the apprenticeship is intended not to simply provide a vehicle for work-based and work-related education, but also to develop the students’ abilities to further progress and contribute within their company.

The programme provides students a common foundation of engineering knowledge in the fundamental areas of manufacturing engineering, design and electrical/ electronic engineering disciplines. It then develops in-depth knowledge in the product design area, focusing not only on the underpinning technology, but also ensuring that the industrial context pervades every module. Engineering professionals from all the companies are committed to bringing their particular view on that context through a programme of keynote presentations to students throughout the entire course.

As a professional engineer, graduates will need to be familiar with and able to apply management techniques to ensure satisfactory and timely completion of projects and to plan for this appropriately. To this end, students undertake a number of work-based projects, supported by a formal programme of skill development.

Employability is a key feature of the entire programme and the development of transferable skills including teamwork, problem solving, IT skills, oral & written communication, analytical & critical thinking as well as the essential engineering skills form a fundamental part of the studies. Concepts of professionalism and engineering ethics are introduced during the Level 4 Introductory Project and subsequently developed in both the Personal and Professional Skills module and the Group Project.

A particular feature of the skill development programme is the time that students will commit to raising their own self-awareness, such that they are able to present confidently to their own and their company’s benefit. Thus, for example students will develop personal vignettes that might be used on their employer’s web site, or used to introduce themselves as a presenter at a sales conference. They will describe their skills and experience in the manner that would be used in a document supporting a tender their employer was making.

The assessment regime employed across all stages of the programme is designed to encourage and develop the required skills and knowledge demanded by employers. Examinations make an efficient use of time, reduce the likelihood of plagiarism and help to ensure that the students are working under a time pressure that is typical of some employment situations. Students are often required to work in groups in completing an assessment and this helps to promote group working and interpersonal skills so highly valued by employers and the professional engineering bodies. An identified and firm hand in date for all assignments replicates the deadlines commonly encountered in the world of work and so promotes student employability.

There are also opportunities for on-campus students outside your programme of study.

For information about other opportunities available to our students who study on campus, click here.

Additional opportunities to develop your experiences more widely will vary if you study at one of our partner colleges. For information about the extra-curricular activities available in any of our colleges please contact the college direct.
37. Particular features of the qualification

38. Professional statutory or regulatory body (PSRB) accreditation

| PSRB accreditation is not relevant to this programme | ✓ |
| PSRB accreditation is currently being sought for this programme |
| This programme currently has PSRB accreditation |

Accreditation is not possible until the first cohort of students have graduated. It is envisaged that accreditation will be sought as soon as possible after this point.

The programme has been designed to be accreditable against the Engineering Council’s standards upon completion of the first graduating cohort. Since the QAA Subject Benchmark Statement for Engineering takes the form of the Engineering Council’s accreditation learning outcomes, the programme is already aligned with the potential requirements for accreditation, and the Faculty will revisit the matter once we have established experience of operating degree courses in a close and symbiotic relationship with industry.

Within the Benchmark Statement/ Accreditation guidelines, HEIs have the option of aligning with the outcomes for Chartered Engineer (CEng) or Incorporated Engineer (IEng). The Faculty’s existing BEng programmes are partially accredited for CEng (graduates require a ‘matching’ masters award to be fully recognised), and to avoid potential confusion the team chose to align with the IEng outcomes, for which full accreditation may be obtained with a three-year bachelor’s degree. The IEng outcomes bring the added advantage of being more practice-focused, compared to the more analytical requirements specified in the CEng specification.

Graduates from the programme will not meanwhile be disadvantaged. Individual graduates are still able to apply for membership of the professional bodies through the Individual Professional Review routes; many individuals do so.

SECTION E: PROGRAMME STRUCTURE AND REGULATIONS

Complete and insert Part B of the Programme Regulations Form, for question 39

SECTION F: ADMISSIONS, LEARNING ENVIRONMENT AND SUPPORT

40. What are the admissions requirements?

The University’s standard admissions requirements can be found in the university regulations. Programme-specific requirements which are in addition to those regulations are given below.

The nature of admissions to the degree apprenticeship is different to admissions to more traditional university programmes. The degree courses contained within the apprenticeship are closed programmes, and thus admissions will not be through UCAS. Degree apprenticeship participants will be employed by an apprenticeship partner. Negotiation between the apprenticeship partner employer and the Faculty will determine whether the degree apprenticeship is the most appropriate programme of study for their particular employee. Those applying for the degree apprenticeship must
be able to demonstrate the potential to complete a bachelor’s degree on completion of the embedded Foundation Degree.

The Faculty’s normal expectation for entry to a bachelor’s degree programme would usually be demonstrated, for example, with the UCAS equivalent of 112 tariff points in cognate subject areas or relevant work experiences; it is envisaged that, in general, entrants to the degree apprenticeship Foundation Degrees will be similarly qualified.

The minimum entry requirements are thus based on the Suggested Entry Requirement specified by the Degree Apprenticeship Standard:

- A Levels at grade C or above in both a Mathematical based subject and a Science, Technology, Engineering or additional Mathematics related subject
- 90+ credits in an Engineering BTEC at level 3

Where applicants do not additionally meet the standard University points tariff for entry their application will be considered individually. It is expected that students will have at least five GCSEs grade A – C including Mathematics, English and a Science (unless competency in numeracy and literacy can be demonstrated in an alternative manner). Admission will be subject to students meeting the requirements for Skills Funding Agency support.

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<tr>
<th>Can students enter with advanced standing?</th>
<th>Yes</th>
<th>No</th>
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</table>

If yes, to which Stages?

- Stage 1
- Stage 2 [✓]
- Stage 3 [✓]
- Stage 4

Apprentices who have previously successfully completed level 4 of a cognate engineering degree or foundation degree would be eligible for consideration for entry with advanced standing.

Similarly apprentices with a Higher National qualification in a cognate engineering discipline would be eligible for consideration.

The University has a process by which applicants whose experience to date already covers one or more modules of the programme they are applying for may seek Accreditation of Prior Learning (APL). Full details can be found here but if you think that this may be relevant to you, please contact the department which offers the programme you are interested in.

41. What kind of support and help will there be?

**Induction and transitions**

Within the wider apprenticeship there are a number of ‘transitions’; students will be supported through each. The team is cognisant that whilst the Degree programme is approved, delivered and awarded by the University, for the apprentice, the various stages of ‘studenthood’ are but one part of a multi-streamed experience (development of professional competences, the degree, employment). The University provides the ‘glue’ that holds the network of employers together, and thus the programme team believe that all participants should maintain active engagement throughout the five years of the apprenticeship. In particular, induction/transition support will be proactively
provided at the beginning of the apprenticeship and at the start of the Degree. Academic staff will play a part, frequently taking the leading role, at all transitional points.

Apprentices will receive an induction on the entire apprenticeship when they first start employment. This is likely to be cohort-wide, and include mentors, academic staff and apprentices. However, it is anticipated that in some cases apprentices may not be able to be released for the cohort-wide induction, and in such cases, the programme leader will attend the apprentice's company-based employee induction. Following the cohort induction, all apprentices will be given access to the University VLE engineering degree apprenticeship programme site, as well as the usual module and programme spaces.

When the apprentices formally enroll as students of the University, and start stage 1 of their studies. They will undergo a traditional student induction, tailored for their pattern of attendance. They will be exposed to various aspects of student academic life and much information on the University and its Services, the Faculty and their chosen programme of study. They are provided with programme information talks by programme and module staff, library visits, talks by representatives from Student Services and the Student’s Union. They receive introductory sessions where they learn to access the Faculty’s home pages, online portal and VLE spaces, Faculty standards and other documents. Technicians talk to students on how to get the most out of our systems and give details on how to access free software. The pattern of attendance reinforces the need for an extended academic induction to spread over a number of weeks, providing support through the first instance of key activities.

**Through-programme support**

The programme will have an active Programme Space on the university's virtual learning environment. This provides a powerful mechanism to maintain communication between students whilst at the University and also whilst in the workplace on placement; its discussion facilities allow it to be used to address frequently asked student questions. Further, it will provide:

- Information (programme handbook, training manuals)
- Calendar (key events can be highlighted)
- Communication (email and discussion tool)
- Relevant link sites

The overall strategy for support and guidance is three-pronged: accessibility to staff and resources; provision of relevant and reliable information; and operation of a responsive system for managing problems as they arise.

All students have individual access to their Programme and Module leaders. All engineering staff comply with *AQH-F16 Guidance and Good Practice on Responses to Student Emails and other Student Contact* and supplement this with an open-door policy. There is also extensive use of face to face and online interaction to provide flexible and efficient communication on day to day issues.

The first year of study for engineering students is treated as one continuous induction period into University life. Close monitoring of student attendance is undertaken by both module and programme leaders and, where necessary, one-to-one interviews with students who default on expected attendance levels to identify any underlying issues. The Programme Leader would necessarily engage with the apprentice’s company mentor in such circumstances.

In line with University guidelines Personal Tutor meetings are arranged with the Personal Tutor for each student in the cohort during the first and second terms; a practice continued at each Stage of the programme.

Programme teams meet with student representatives each term in Staff Student Liaison Committees (SSLCs) in order to formally address issues around the student experience. In many instances, issues can quickly and easily be resolved in this way. In some cases they need referral to the Boards
of Study. In either event, the VLE is used as a mechanism for formally feeding back to the students regarding the resolution or otherwise of the issues raised.

**Relationship with apprentices’ employers**

At an academic level, programme leaders and industrial mentors will have clear and direct communications in order to manage the students’ induction, attendance, timetable, programme of industrial visits, the details of work-based project activity, visiting specialist lecturers from industry, exchange of scholarship and the like. It is envisaged that an outline of these procedures will be agreed within the operational level handbook.

The University provides a range of professional support services including [wellbeing](#), [counselling](#), [disability support](#), and a [Chaplaincy](#). Click on the links for further information.

42. What resources will I have access to?

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<tr>
<th>On campus</th>
<th>✓</th>
<th>In a partner college</th>
<th>By distance learning</th>
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**On campus**

- General Teaching and Learning Space ✓
- IT ✓
- Library ✓
- VLE ✓
- Laboratory ✓
- Studio
- Performance space
- Other specialist ✓
- Technical resources ✓

Text for details listed above:

The programme has excellent teaching resources including:

- The latest teaching and learning facilities, including the new Learning Laboratory, IT suites providing access to engineering simulation and CAD software, some of which are available to students at no cost for installation on their own computers.

- Multi-disciplinary Engineering laboratories.

- Dedicated students’ workshop facilities

- Social learning spaces including:
  - Student learning areas adjacent to the PC cells in the Goldman Building.
  - Open access computers (with technical support) with access to the usual range of Microsoft Office applications.

- The Institute of Automotive and Manufacturing Advanced Practice (AMAP) provides the Faculty with access to state of the art computer controlled machine tools, metrology and rapid prototyping equipment and training in the use of particularly relevant software.
Information about the University’s facilities can be found [here](#).

43. Are there any additional costs on top of the fees?

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<tr>
<th>Option</th>
<th>Description</th>
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<tbody>
<tr>
<td>No, but all students buy some study materials such as books and provide their own basic study materials.</td>
<td><img src="" alt=" " /></td>
</tr>
<tr>
<td>Yes (optional) All students buy some study materials such as books and provide their own basic study materials. In addition there are some are additional costs for optional activities associated with the programme (see below)</td>
<td><img src="" alt=" " /></td>
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<tr>
<td>Yes (essential) All students buy some study materials such as books and provide their own basic study materials. In addition there are some are essential additional costs associated with the programme (see below)</td>
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</tbody>
</table>

44. How are student views represented?

All taught programmes in the University have student representatives for each Stage (year-group) of each programme who meet in a Student-Staff Liaison Committee (SSLC) where they can raise students’ views and concerns. The Students’ Union and the faculties together provide training for student representatives. SSLCs and focus groups are also used to obtain student feedback on plans for developing existing programmes and designing new ones. Feedback on your programme is obtained every year through module questionnaires and informs the annual review of your programme. Student representatives are also invited to attend Programme and Module Studies Boards which manage the delivery and development of programmes and modules. Faculty Academic Committee, also has student representation. This allows students to be involved in higher-level plans for teaching and learning. At university level Students are represented on University level Committees by sabbatical officers who are the elected leaders of the Students' Union.

The University’s student representation and feedback policy can be found [here](#).

Final-year students are also invited to complete a National Student Survey (NSS) which asks a standard set of questions across the whole country. The results of this are discussed at Programme Studies Boards and at Faculty Academic Committee to identify good practice which can be shared and problems which need to be addressed. We rely heavily on student input to interpret the results of the NSS and ensure that we make the most appropriate changes.

SECTION G: QUALITY MANAGEMENT

45. National subject benchmarks

The Quality Assurance Agency (QAA) for Higher Education publishes benchmark statements which give guidance as to the skills and knowledge which graduates in various subjects and in certain types of degree are expected to have. These can be found [here](#).
Are there any benchmark statements for this programme?  

| YES | NO |

The subject benchmark(s) for this programme is/are:

QAA Subject Benchmark statement for Engineering

Engineering Council: Accreditation of Higher Education Programmes (AHEP) document
http://www.engc.org.uk/ahep

The QAA also publishes a Framework for Higher Education Qualifications (FHEQ) which defines the generic skills and abilities expected of students who have achieved awards at a given level and with which our programmes align. The FHEQ can be found here.

46. How are the quality and standards of the programme assured?

The programme is managed and quality assured through the University’s standard processes. Programmes are overseen by Module and Programme Studies Boards which include student representatives. Each year each module leader provides a brief report on the delivery of the module, identifying strengths and areas for development, and the programme team reviews the programme as a whole. The purpose of this is to ensure that the programme is coherent and up-to-date, with suitable progression from one Stage to another, and a good fit (alignment) between what is taught and how students learn and are assessed - the learning outcomes, content and types of teaching, learning and assessment. Student achievement, including progress between Stages of the programme and degree classification, is kept under review. The programme review report is sent to the Programme Studies Board and the Faculty in turn reports issues to the University’s Quality Management Sub-Committee (QMSC).

External examiners are appointed to oversee and advise on the assessment of the programme. They ensure that the standards of the programme are comparable with those of similar programmes elsewhere in the UK and are also involved in the assessment process to make sure that it is fair. They are invited to comment on proposed developments to the programme. Their reports are sent to the Deputy Vice-Chancellor (Academic) as well as to the Faculty so that issues of concern can be addressed.

All programmes are reviewed by the University on a six-yearly cycle to identify good practice and areas for enhancement. Programmes are revalidated through this review process. These reviews include at least one academic specialist in the subject area concerned from another UK university. Quality Assurance Agency (QAA) review reports for Sunderland can be found here.

Further information about our quality processes can be found here.