

PROGRAMME SPECIFICATION



1	Awarding Institution	Newcastle University
2	Teaching Institution	Newcastle University
3	Final Award	BEng (Honours)
4	Programme Title	Electrical Power Engineering
5	UCAS/Programme Code	1214U
6	Programme Accreditation	N/A
7	QAA Subject Benchmark(s)	Engineering
8	FHEQ Level	6
9	Last updated	July 2013

10 Programme Aims

This degree programme is designed to enable students to further their Diploma-level or similar qualifications of relevant Accredited Prior Learning to a Bachelor of Engineering (Honours) Degree.

Programme Aims:

- To provide opportunities for students to undertake a broad-based education in electrical power engineering and to acquire appropriate knowledge and understanding, of engineering 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 UK's FHEQ at Honours level of the National Qualifications Framework and meets the requirements of the National Subject Benchmarks in Engineering.

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. The programme outcomes have references to the benchmark statements for Engineering.

Knowledge and Understanding

On completing the programme students should have appropriate knowledge and understanding of:

- A1: Basic mathematics, science and technologies relevant to electrical power engineering (E).
A2: The fundamental concepts, principles and theories of electrical power engineering (E).
A3: Business and management techniques relevant to engineering and the management of engineering projects (E).
A4: Detailed knowledge and understanding of the essential facts, concepts, principles and theories relevant to various specialisations within electrical power engineering (E).
A5: The application of IT principles and tools as appropriate to the role of an electrical power engineer (E).
A6: The components and materials used by electrical power engineers (E).

Teaching and Learning Methods

Acquisition of A1, A2 and A5 is through a combination of lectures, tutorials, example classes, laboratory experiments, coursework and projects in Year 1.

Acquisition of A5 is also through simulation exercises.

Acquisition of A3 is through a combination of lectures, supervisions, coursework and projects in both years of the programme.

Acquisition of A4 is through a combination of lectures, laboratory experiments, coursework and projects in Year 2.

Acquisition of A6 is through lectures, laboratory experiments, tutorials and project work throughout the programme.

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

Assessment Strategy

Testing the knowledge base is done through a combination of unseen written examinations and assessed coursework in the form of laboratory reports, case studies, problem solving exercises, coursework reports and project reports and presentations.

Intellectual Skills

On completing the programme students should be able to:

B1: Plan, conduct and report a programme of investigative work.

B2: Analyse electrical and electronic systems (E).

B3: Design a circuit or system to meet a specification (E).

B4: Be creative in the solution of problems and in the development of designs (E).

B5: Evaluate designs and consider improvements (E).

B6: Integrate and evaluate information and data from a variety of sources (E).

B7: Determine the appropriate mathematical tools for the solution of problems in electrical and electronic engineering (E).

B8: Determine the correct model to use in the analysis of an electrical and electronic engineering circuits system (E).

B9: Determine the correct computer techniques to use for the analysis of electrical and electronic engineering problems and synthesis of circuits and systems (E).

Teaching and Learning Methods

Intellectual skills are developed through the teaching and learning programme outlined above (and in section 11).

Analysis and problem solving skills are further developed through example classes, tutorials, coursework and project work.

Experimental, research and design skills are further developed through coursework activities, laboratory experiments, and projects. Creative and design skills are developed through design and project work.

Assessment Strategy

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

Experimental, research and design skills are assessed through laboratory experiment reports, assignments and project reports, presentations and written examinations.

Creative and design skills are assessed through coursework, written examinations and project work.

Practical Skills
<p>On completing the programme students should be able to:</p> <p>C1: Execute safely a series of experiments (E). C2: Use laboratory equipment to generate data and monitor the performance of circuits and systems (E). C3: Analyse experimental or computational results and determine their strength and validity (E). C4: Prepare technical reports. C5: Give technical presentations. C6: Use the scientific literature effectively (E). C7: Take notes effectively. C8: Use computational tools and packages (E). C9: Apply the appropriate mathematical tools for the solution of problems in electrical and electronic engineering (E). C10: Apply the correct model to use in the analysis of an electrical and electronic engineering circuits system (E). C11: Apply the correct computer techniques to use for the analysis of electrical and electronic engineering problems and synthesis of circuits and systems. (E). C12: Apply project management techniques to the organisation of small projects (E). C13: Design circuits and systems (E).</p>
Teaching and Learning Methods
<p>Practical skills are developed through the teaching and learning programme outlined above (and in section 11). Skills (C1-C4) are developed through laboratory experiments and project work. Skills (C4-C7, C9) are taught through practice throughout the course. In terms of general computational skills, skill C8 is taught through classes in Year 1, specialist packages are introduced in particular courses.</p>
Assessment Strategy
<p>Assessment of skills (C1-C6) is through observed laboratory work, laboratory and project report writing and assessed presentations and demonstrations. Skill C8 is assessed directly by assignment and by written examination and by integration into project and laboratory work. Skill C9 is assessed through project work and through extended coursework. Skills (C10-C13) are assessed through written examination, assignments and project work</p>
Transferable/Key Skills
<p>On completing the programme students should be able to:</p> <p>D1: Communicate effectively in writing, verbally and graphically (E). D2: Give oral presentations using a variety of visual aids (E). D3: Be able to organise data (E). D4: Apply mathematical skills (E). D5: Work as a member of a team to closely specified goals (E). D6: Use information and communications technology (E). D7: Manage resources and time (E). D8: Learn independently in familiar and unfamiliar situations with open-mindedness and in the spirit of critical enquiry (E). D9: Learn effectively for the purpose of continuing professional development and in a wider context throughout their career (E).</p>

Teaching and Learning Methods

Transferable skills are developed through the teaching and learning programme outlined above (and in section 11).

Skills D1, D2 and D7 are taught through classes and reinforced through feedback from laboratory and project reports and presentations.

Skill D3 is taught through laboratory work.

Skill D4 is integrated into the majority of the course.

Skill D5 is taught as part of group project activities in Year 1.

Skills D6 and D7 are taught through courses in Year 1 and through feedback related to laboratory and project work.

Skills D8 and D9 are inculcated throughout the course.

Assessment Strategy

Skills D1 and D3 are assessed through coursework, laboratory and project reports.

Skill D2 is assessed through presentations.

Skill D4 is assessed throughout the course.

Skill D5 is assessed as part of the group project activities in Year 1.

Skill D8 is assessed as part of specialist modules and through integration in other activities.

Other skills are not directly assessed.

12 Programme Curriculum, Structure and Features

Basic structure of the programme

This is a 2 year full-time programme. In each academic year students are required to take 120 credits, with a 60 credit split per semester. Students must complete 240 credits for the award of the BEng (Honours) degree.

Year 1: Reinforces the fundamentals of Electrical Engineering that would have been gained during Diploma courses as well as developing deeper knowledge in the following areas:

Automatic Control, Electrical Systems, Digital Electronics, Analogue Electronics, Random Signals and Processes, Electromagnetic Fields and Waves, Computer Systems and Microprocessors, Signals and Communications and Project and Professional issues.

During the summer of Year 1 students are required to start work towards their final year project while in Newcastle as part of the Overseas Immersion Programme.

Year 2: Includes modules covering the following areas:

State Space Analysis and Controller Design, Electrical Machines and Generators, Power Electronics, Generation, Transmission and Distribution, Renewable Energy Systems, Thermofluid Dynamics, High Voltage Technology. Year 2 also includes a final year project which addresses many of the learning outcomes.

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

This programme is specifically designed for those candidates who have successfully completed a Diploma in Electrical Engineering or relevant subject at any Polytechnic in Singapore.

Progression from Year 1 to Year 2 and the award of the final degree are subject to the University Undergraduate Progress Regulations and Undergraduate Examination Conventions.

This programme is delivered by Newcastle University in collaboration with the Singapore Institute of Technology, at the Nanyang Polytechnic campus in Singapore.

The quality and standards of the delivery in Singapore will be the same as our other undergraduate degree programmes offered by the School at Newcastle University. Successful candidates will be awarded a BEng degree from Newcastle University.

After successful completion of Year 1 in Singapore, students should attend an immersion programme (OIP) delivered at Newcastle University campus during the UK summer vacation over a short period of 3-5 weeks. The objectives of the OIP are to embed and develop academic skills and information literacy demanded for high-level performance at Honours degree level (and in particular the individual Final Year Project) focussed around the Newcastle University Graduate Skills Framework.

Programme regulations (link to on-line version)

<http://www.ncl.ac.uk/regulations/programme/>

13 Criteria for admission

Entry qualifications

The degree programme is designed for students who hold a Diploma in Electrical Engineering or equivalent qualification from any of the Polytechnics in Singapore (IEng- and EngTech-type at FHEQ Level 4 or higher).

The GPA entrance requirement for Year 1 entry onto this degree programme is 3.0 and above. This is in-line with our entry requirement for direct entry into Stage 2 of our Electrical Engineering Undergraduate degree programmes delivered in Newcastle.

Admissions policy/selection tools

The admissions procedure will be carried out by the Singapore Institute of Technology in collaboration with the Undergraduate Admissions team at Newcastle University and selectors within the School of Electrical and Electronic Engineering.

Level of English Language capability

Singapore Diploma graduates, having studied in an English academic medium prior to entry, are exempted from English requirements. The selectors for the Electrical Power Engineering programme, will closely monitor the English quality by various means ('O' level, diploma modules, interview, personal statement etc) to identify weaker candidates. Remedial actions may be taken for these applicants. Other applicants, whose first language is not English, would be required to demonstrate achievement of IELTS 6.5 (or equivalent).

14 Support for Student Learning

Newcastle University Student Services portal provides links to key services and other information and is available at: <http://www.ncl.ac.uk/students/>.

The following link includes student information for Singapore Campus students: <http://www.ncl.ac.uk/singapore/students/index.htm>.

Information regarding Student Support Services and facilities which are available at Nanyang Polytechnic please visit: <http://www.ncl.ac.uk/singapore/students/index.htm>.

Induction

During the first week of the first semester students attend an induction programme. New students will be given a general introduction to University life and the University's principle support services and general information about the School and their programme, as described in the Degree Programme Handbook. New and continuing students will be given detailed programme information and the timetable of lectures/practicals/labs/ tutorials/etc.

Study skills support

Students will learn a range of Personal Transferable Skills, including Study Skills, as outlined in the Programme Specification. Some of this material, e.g. time management is covered in the appropriate Induction Programme. Students are explicitly tutored on their approach to both group and individual projects.

Academic support

The initial point of contact for a student is with a lecturer or module leader, or their tutor (see below) for more generic issues. Thereafter the Degree Programme Director or Head of School (Newcastle University) may be consulted. Issues relating to the programme may be raised at the Staff-Student Committee, and/or at the Board of Studies.

Pastoral support

All students are assigned a personal tutor whose responsibility is to monitor the academic performance and overall well-being of their tutees.

In addition Newcastle University and Nanyang Polytechnic offer a range of support services, details of which are available at the above links.

Support for students with disabilities

The Nanyang Disability Support Service provides help and advice for disabled students. It provides individuals with: advice about facilities, services and the accessibility of campus; details about the technical support available; guidance in study skills and advice on financial support arrangements; a resources room with equipment and software to assist students in their studies. During the immersion programme in Newcastle, help and advice for students with disability will be provided by Newcastle University's Disability Support Service.

Learning resources

Newcastle University's main learning resources are provided by the Robinson Library (for books, journals, online resources), and by Information Systems and Services, which supports campus-wide computing facilities.

Students on this programme will have access to a wide range of computing facilities through Newcastle University's "Remote Access System" or ras.ncl.ac.uk.

Increasingly, library material is available electronically via remote access so some of Newcastle University's library holdings will be available to students in Singapore.

The Singapore Institute of Technology, through facilities available at Nanyang Polytechnic, provides an extensive and advanced library facility with access to media, e-books, databases, e-journals and many other information resources such as OPAC on their library catalogues. More information can be found at: <http://library.nyp.edu.sg/>.

15 Methods for evaluating and improving the quality and standards of teaching and learning

Module reviews

All modules are subject to review by questionnaires which are considered by the Board of Studies. Changes to, or the introduction of new, modules are considered at the Board of Studies and/or the School Learning and Teaching Committee (SLTC). Student opinion is sought at the Staff-Student Committee and/or the Board of Studies. New modules and major changes to existing modules are subject to approval by the Faculty Learning, Teaching and Student Experience Committee (FLTSEC).

Programme reviews

The Board of Studies conducts an Annual Monitoring and Review of the degree programme and reports to FLTSEC. FLTSEC takes an overview of all programmes within the Faculty and reports any Faculty or institutional issues to the University Learning, Teaching and Student Experience Committee (ULTSEC).

External Examiner reports

External Examiner reports are considered by the Board of Studies. The Board responds to these reports through FLTSEC. External Examiner reports are shared with institutional student representatives, through the Staff-Student Committee.

Student evaluations

All modules, and the degree programme, are subject to review by student questionnaires. Informal student evaluation is also obtained at the Staff-Student Committee, and the Board of Studies. The results from student surveys are considered as part of the Annual Monitoring and Review of the programme and any arising actions are captured at programme and School / institutional level and reported to the appropriate body.

Mechanisms for gaining student feedback

Feedback is channelled via the Staff-Student Committee and the Board of Studies.

Faculty and University Review Mechanisms

The programme is subject to the University's Internal Subject Review process. Every five years degree programmes in each subject area are subject to periodic review. This involves both the detailed consideration of a range of documentation, and a two-day review visit by a review team which includes an external subject specialist in addition to University and Faculty representatives. Following the review a report is produced, which forms the basis for a decision by ULTSEC on whether the programmes reviewed should be re-approved for a further five year period.

16 Regulation of assessment

Pass mark

The pass mark is 40%

Course requirements

Progression is subject to the University's Undergraduate Progress Regulations and Undergraduate Examination Conventions. In summary, students must pass, or be deemed to have passed, 120 credits at each Stage. The University's Learning, Teaching and Student Experience Committee has approved a variation in Undergraduate Examination Convention J.34 to the effect that the maximum number of credits that may be compensated is 20 only.

Weighting of stages

The marks from Year 1 and 2 will contribute to the final classification of the degree
The weighting of marks contributing to the degree for Year 1 and 3 is 1:3.

Common Marking Scheme

The University employs a common marking scheme, which is specified in the Undergraduate Examination Conventions, namely

	Modules used for degree classification (DC)	Modules not used for degree classification
<40	Fail	Failing
40-49	Third Class	Basic
50-59	Second Class, Second Division	Good
60-69	Second Class, First Division	Very Good
70+	First Class	Excellent

Role of the External Examiner

An External Examiner, a distinguished member of the subject community, is appointed by Faculty Learning, Teaching and Student Experience Committee, following recommendation from the Board of Studies. The External Examiner is expected to:

- i. See and approve assessment papers
- ii. Moderate examination and coursework marking
- iii. Attend the Board of Examiners
- iv. Report to the University on the standards of the programme
- v.

In addition, information relating to the programme is provided in:

The University Prospectus: <http://www.ncl.ac.uk/undergraduate/>.

The School Brochure: <http://www.ncl.ac.uk/marketing/services/print/publications/ordering/>.

Degree Programme and University Regulations: <http://www.ncl.ac.uk/regulations/docs/>.

The Degree Programme Handbook: You will be able to access this from our school website once available: <http://www.ncl.ac.uk/eee/>.

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. The accuracy of the information contained is reviewed by the University and may be checked by the Quality Assurance Agency for Higher Education.

Mapping of Intended Learning Outcomes onto Curriculum/Modules

Module	Type	Intended Learning Outcomes			
		A	B	C	D
EEE2200	Compulsory	1, 2	1, 2, 4, 5, 6, 7, 8, 9	1, 2, 3, 4, 7, 8, 9, 10, 11, 13	1, 3, 4, 5, 7, 8
EEE2201	Compulsory	1, 2	1, 2, 4, 5, 6, 7, 8	1, 2, 3, 4, 7, 9, 10, 13	1, 3, 4, 5, 7, 8
EEE2202	Compulsory	1, 2, 6	1, 2, 4, 5, 6, 7, 8	1, 2, 3, 4, 7, 9, 10, 13	1, 3, 4, 5, 7, 8
EEE2203	Compulsory	1, 2, 6	1, 2, 4, 5, 6, 7, 8	1, 2, 3, 4, 7, 9, 10, 13	1, 3, 4, 5, 7, 8
EEE2204	Compulsory	1, 2	1, 4, 6, 7	4, 7, 9	1, 3, 4, 7, 8
EEE2205	Compulsory	1, 2, 6	1, 2, 4, 5, 6, 7, 8, 9	1, 2, 3, 4, 7, 8, 9, 10, 11	1, 3, 4, 5, 7, 8
EEE2206	Compulsory	1, 2, 5	1, 2, 3, 4, 5, 6, 7, 9	1, 2, 3, 4, 6, 7, 8, 9, 11, 13	1, 3, 4, 5, 6, 7, 8
EEE2207	Compulsory	3	1, 3, 4, 5, 6, 7, 8, 9	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13	1, 2, 3, 4, 5, 6, 7, 8, 9
EEE2208	Compulsory	1, 2, 5	1, 2, 4, 6, 7, 8, 9	1, 2, 3, 4, 6, 7, 8, 9, 10, 11	1, 3, 4, 5, 6, 7, 8
EEE3200	Compulsory	4, 5	1, 2, 3, 4, 5, 6, 7, 8, 9	3, 6, 7, 8, 9, 10, 11, 13	1, 3, 4, 6, 7, 8, 9
EEE3201	Compulsory	4, 6	1, 2, 3, 4, 5, 6, 7, 8, 9	3, 6, 7, 8, 9, 10, 11, 13	1, 3, 4, 7, 8, 9
EEE3202	Compulsory	4, 6	1, 2, 3, 4, 5, 6, 7, 8, 9	3, 6, 7, 8, 9, 10, 11, 13	1, 3, 4, 7, 8, 9
EEE3203	Compulsory	4, 5	1, 2, 3, 4, 5, 6, 7, 8, 9	3, 6, 7, 8, 9, 10, 11, 13	1, 3, 4, 6, 7, 8, 9
EEE3204	Compulsory	4, 6	2, 4, 5, 6, 7, 8, 9	3, 6, 7, 8, 9, 10, 11, 13	1, 3, 4, 7, 8, 9
EEE3205	Compulsory	4, 6	1, 2, 3, 4, 5, 6, 7, 8, 9	3, 4, 6, 7, 8, 9, 10, 11, 12, 13	1, 3, 4, 5, 7, 8, 9
EEE3206	Compulsory	4, 6	1, 2, 3, 4, 5, 6, 7, 8, 9	3, 6, 7, 8, 9, 10, 11, 13	1, 3, 4, 7, 8, 9
EEE3207	Compulsory	3, 4, 5, 6	1, 2, 3, 4, 5, 6, 7, 8, 9	3, 4, 5, 6, 8, 9, 10, 11, 12, 13	1, 2, 3, 4, 6, 7, 8, 9