UNIVERSITY
OF
NEWCASTLE UPON TYNE

DEGREE PROGRAMME SPECIFICATION

1.Awarding Institution:	University of Newcastle upon Tyne
2.Teaching Institution:	University of Newcastle upon Tyne
3. Programme Accredited by:	IEE
4.Final Award:	M.Eng. (Hons)
5.Programme Titles:	Electrical and Electronic Engineering or Electronic Engineering or Electronic Communications
6. UCAS codes:	H605, H602, H621
7. QAA Benchmarking Group	Engineering
8. Date of production / revision	January 2004

9. Educational Aims of the Programme

The programme aims:

- to provide opportunities for students to undertake a broad-based education in electrical, electronic and electronic communications 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 allow for the development of increased knowledge in areas of specialisation,
- to give extended experience of group activities,
- to give experience of working in an industrial or related environment,

- to produce graduates who will meet the accreditation requirements of the Institution of Electrical Engineers,

- to provide a qualification which meets the designated learning outcomes at level M of the National Qualifications Framework (www.qaa.ac.uk) and meets the requirements of the National Subject Benchmarks in Engineering (www.qaa.ac.uk/crntwork/benchmark/engineering)

10. Programme 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 (E).
The typical (modal) student will have:

A Knowledge and understanding

Knowledge and understanding of:

1. Basic mathematics, science and technologies that are relevant to electrical and electronic engineering (E).
2. The fundamental concepts, principles and theories of electrical and electronic engineering (E).
3. Business and management techniques, together with product awareness, as relevant to engineering (E).
4. Detailed knowledge and understanding of the essential facts, concepts, principles and theories relevant to the student's chosen area of specialisation within electrical and electronic engineering and the ability to apply this at an advanced level (E).
5. The application of IT principles and tools as appropriate to the role of an electrical and electronic engineer (E).
6. The components and materials used by electrical and electronic engineers (E).
7. Business practices and experience of tools used in the field of engineering for the management of engineering projects, experience of commercial engineering practice (E).
8. Safe working practices as they apply the field of electrical and electronic engineering (E).

Teaching/learning methods and strategies

Acquisition of 1, 2 and 5 is through a combination of lectures, tutorials, example classes, laboratory experiments, coursework and projects in Stages 1 and 2.
Acquisition of 5 is also through simulation exercises, CAL and CAD.

Acquisition of 3 is through a combination of lectures, supervisions, coursework and projects in Stages 2, 3 and 4.
Acquisition of 4 is through a combination of lectures, laboratory experiments, coursework and projects in Stages 3 and 4.
Acquisition of 6 is through lectures, laboratory experiments, tutorials and project work throughout the programme.
Acquisition of 7 is through a combination of lectures, seminars, coursework and projects, especially in Stages 2 and 3 and through project work in Stages 2, 3, and 4.
Acquisition of 8 is through specific lectures and workshop practice in Stage 1 and is also addressed as appropriate during lecture and laboratory work throughout the course.

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

Testing the knowledge base is through a combination of unseen written examinations (1-6), and assessed coursework (1-8) in the form of laboratory reports (1-8), essays (7), coursework reports (1-7) and project reports and presentations (2-8).

B Intellectual Abilities

Intellectual (thinking) skills able to:

1. Plan, conduct and report a programme of investigative work.
2. Analyse electrical and electronic systems (E).
3. Design a circuit or system to meet a specification (E).
4. Be creative in the solution of problems and in the development of designs (E).
5. Evaluate designs and consider improvements (E).
6. Integrate and evaluate information and data from a variety of sources (E).
7. Determine the appropriate mathematical tools for the solution of problems in electrical and electronic engineering (E).
8. Determine the correct model to use in the analysis of an electrical and electronic engineering circuits and system (E).
9. Determine the correct computer techniques to use for the analysis of electrical and electronic engineering problems and synthesis of circuits and systems. (E)
10. Develop detailed specifications from outline proposals.

11. Organise work within a group for the achievement of defined goals.

Teaching/learning methods and strategies

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

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.

C. Practical skills

The skills to:

1. Execute safely a series of experiments (E).
2. Use laboratory equipment to generate data and monitor the performance of circuits and systems (E).
3. Analyse experimental or computational results and determine their strength and validity (E).
4. Prepare technical reports, individually and as part of a group.
5. Give technical presentations, individually and as part of a group.
6. Use the scientific literature effectively (E).
7. Take notes effectively.
8. Use computational tools and packages (E).
9. Apply the appropriate mathematical tools for the solution of problems in electrical and electronic engineering (E).

10. Apply the correct model to use in the analysis of an electrical and electronic engineering circuits system. (E).
11. Apply the correct computer techniques to use for the analysis of electrical and electronic engineering problems and synthesis of circuits and systems. (E).
12. Apply project management techniques to the organisation of small projects (E).
13. Design circuits and systems (E).
14. Report critically on the engineering procedures of organisations

Teaching/learning methods and strategies

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

Skills (1-4) are developed through laboratory experiments and project work and through safety lectures.

Skills (4-7,9) are taught through communications skills lectures and through practice throughout the course.

In terms of general computational skills Skill 8 is taught through classes in Stages 1 and 2, specialist packages are introduced in particular courses.

Assessment

Assessment of skills (1-6) is through observed laboratory work, laboratory and project report writing and assessed presentations and demonstrations. Skill 8 is assessed directly by assignment and by written examination and by integration into project and laboratory work. Skill 9 is assessed through project work and through extended coursework. Skills (10-14) are assessed through written examination, assignments and project work.

D General Transferable Skills

The skills to:

1. Communicate effectively in writing, verbally and graphically (E).
2. Give oral presentations using a variety of visual aids (E).
3. Be able to organise data (E).
4. Apply mathematical skills (E).
5. Work as a member of a team with loosely defined goals (E).

6. Use information and communications technology (E).
7. Manage resources and time both for themselves and for others (E).
8. Learn independently in familiar and unfamiliar situations with open-mindedness and in the spirit of critical enquiry (E).
9. Learn effectively for the purpose of continuing professional development and in a wider context throughout their career (E).

Teaching/learning methods and strategies

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

Skills (1,2,7) are taught through classes and reinforced through feedback from laboratory and project reports and presentations.

Skill 3 is taught through laboratory work.

Skill 4 is integrated into the majority of the course.

Skill 5 is taught as part of group project activities in Stages 2 and 4.

Skill 6 and 7 are taught through courses in Stages 1 and 2 and through feedback related to laboratory and project work.

Skills 8 and 9 are inculcated throughout the course.

Assessment

Skills (1,3) are assessed through coursework, laboratory and project reports.

Skill 2 is assessed through presentations.

Skill 4 is assessed throughout the course.

Skill5 is assessed as part of the group project activities in Stages 2 and 4

Skill 8 is assessed as part of specialist modules and through integration in other activities.

Other skills are not directly assessed.

11. Programme structures: credits, modules, levels and awards.

The normal Undergraduate year is arranged in three terms and is divided into two Semesters. Semester 1 is of twelve weeks, and is 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 four years, although it is possible to take a gap year.

Every Honours student studies 120 credits in each Stage (or year), resulting in MEng candidates completing 480 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 Stage 1. In Stage 2 there is a small amount of specialisation. In the third and fourth years students elect to follow a specialisation within electrical and electronic engineering and electronic communications. The courses are common with the equivalent BEng programme up to the end of Stage 2 and it is possible for students to transfer between courses (subject to conditions) up to this point.

There is a Foundation Year for candidates not adequately qualified to embark on Stage 1 of Degree Programmes.

(Refs: Newcastle University Undergraduate Progress Regulations; http://www.newcastle.ac.uk/calendar/volume1.html)

Stage 1

Module code	Credit	Descriptive Title
EEE101	10	Electromagnetism I
EEE102	10	Circuit Theory
EEE103	10	Analogue Electronics I
EEE104	10	Physical Electronics I
EEE105	10	Electromagnetic Devices
EEE106	10	Digital Electronics I
EEE107	10	Linear Systems and Signals I
EEE122	5	Computer Engineering I
EEE109	10	Project
EEE121	5	Communication Studies
CSC601	10	Introduction to C++
ENM105	20	Engineering Mathematics I

Stage 1 aims to provide all students with a firm foundation on which to build their future studies. A substantial mathematical base (A1) is provided through ENM105, this is enhanced by mathematical techniques and practice introduced in other modules. Knowledge and understanding (A2-A5) is provided through the technical modules, which also serve to broaden and enhance intellectual abilities (B1-B3, B5, B6, B8). Practical work in the laboratory emphasises a project based approach, this, together with computing classes, develops a range of practical (C1-C5) and transferable (D1-D4, D7, D8, D10) skills.

Stage 2

All candidates shall take the following compulsory modules:

Module code	Credit	Descriptive Title
EEE201	10	Electromagnetism II
EEE202	10	Linear Systems and Signals II
EEE203	10	Analogue Electronics II
EEE204	10	Digital Electronics II
EEE205	10	Automatic Control
EEE207	10	Communications
EEE209	10	Computer Engineering II
EEE210	10	Project
EEE212	5	Project management
CSC603	10	Hardware/Software Interfaces
ENM226	5	Discrete Transforms

Candidates in Electrical and Electronic Engineering shall take the following compulsory topic:

Module code	Credit	Descriptive Title
EEE206	10	Electrical Systems and Machines

and shall select one of the following optional modules:

Module code	Credit	Descriptive Title
EEE208	10	Physical Electronics II
MMM221	10	Mechanical Engineering A

Candidates in Electronic Engineering shall take the following compulsory modules:

Module code	Credit	Descriptive Title
EEE206	10	Electrical Systems and Machines
EEE208	10	Physical Electronics II

Candidates in Electronic Communications shall take the following compulsory topics:

Module code	Credit	Descriptive Title
EEE208	10	Physical Electronics II
EEE213	10	Information Theory and Coding

Stage 2 builds on the work of Stage 1, continuing the development of an understanding of mathematical methods (A1), especially in ENM226 and EEE202. Knowledge and understanding (A2-A5) 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 (EEE210) which develops and exercises practical skills (C) as well as enhancing intellectual abilities. A module on Project Management provides and understanding of the requirements of the management of engineering programmes (A6-A9). This work is practised and assessed as part of the group project (B5, B7, B9, C6-C10, D10, D11).

Stage 3

All candidates take the following compulsory modules

Module code	Credit	Descriptive Title
EEE350/3/4	40	Individual Project and Dissertation including exercises in Communication Skills
EEE351/2	10	Study Project
ENG201	10	Introduction to Business Management

Candidates for Electronic Communications will also take the following compulsory modules

EEE305	10	Digital Signal Processing
EEE306	10	Analogue Systems
EEE307	10	Radiowave Engineering
EEE408	10	Telecommunications

Candidates for Electrical and Electronic Engineering will, with the approval of the Degree programme Director, select modules to the total of 60 credits from LISTS 1, 3, 4 and 5.
Note at least 10 credits must be selected from LIST 1 during Stages 3 or 4

Candidates for Electronic Engineering will, with the approval of the Degree programme Director, select modules to the total of 60 credits from LISTS 1 2, 3 and 4.
Note at least 10 credits must be selected from LISTS 1 or 2 during Stages 3 or 4

Candidates for Electronic Communications will, with the approval of the Degree programme Director, select modules to the total of 20 credits from LIST 3.

LIST 1

Module code	Credit	Descriptive Title
EEE402	10	Design Tools for Digital Systems
EEE415	10	Semiconductor Fabrication
EEE406	10	Design of Machines and Drives
EEE413	10	Power Transmission Engineering
EEE421	10	Distributed Control Systems

LIST 2

Module code	Credit	Descriptive Title
EEE416	10	Advanced Communication Systems
EEE403	10	Data Communications and Signals

LIST 3

Module code	Credit	Descriptive Title
EEE301	10	Control Systems
EEE308	10	Digital electronics III
EEE309	10	Industrial Automation

EEE314	10	Embedded Systems
EEE402	10	Design Tools for Digital Systems
EEE404	10	Design of VLSI Systems
EEE405	10	Image Processing and Machine Vision
EEE409	10	Optoelectronics
EEE410	10	Satellite Engineering
EEE411	10	Digital Control
EEE412	10	Computer Engineering III
EEE414	10	Semiconductor Devices
EEE415	10	Semiconductor Fabrication
ENG402	10	Management of New Product Introduction

LIST 4

Module code	Credit	Descriptive Title
EEE302	10	Fields
EEE303	10	Electrical Machines
EEE304	10	Power Electronics
EEE305	10	Digital Signal Processing
EEE306	10	Analogue systems
EEE307	10	Radio Wave Engineering
EEE401	10	Electric Drives
EEE407	10	Power System Operation and Control
EEE408	10	Telecommunications

LIST 5

Module code	Credit	Descriptive Title
MMM221	10	Mechanical Engineering A
MMM380	10	Mechanical Engineering B

With the permission of the Degree programme Director, modules up to the value of 20 credits may be selected from options offered by the Dept of Engineering Mathematics or a foreign language module.

Stage 3 continues to enhance and expand the student's knowledge, understanding and intellectual abilities. However, as distinct from Stages 1 and 2, where almost all modules are compulsory, the student may now opt to specialise in particular aspects of electrical and electronic engineering. All students take a module in business management 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.

Stage 4

All candidates must take the following compulsory modules

Module code	Credit	Descriptive Title

EEE450	30	Industrial/Research Project with Report
EEE451	10	Organisational Review
EEE454	30	Group Design Project with Report
EEE422/423	10	Extended coursework on Applications and Design

and
with the permission of the degree programme director
either
A 10 credit module taken from:

for Electrical and Electronic Engineering candidates LISTS 1, 3, 4 and 5
for Electronic Engineering candidates LISTS 1, 2, 3 and 4
for Electronic Communications candidates LISTS 1 and 3

or

Module code	Credit	Descriptive Title
EEE454	10	Elective Module – This shall consist of one of the following: (i) a 10 credit equivalent module taken at a local university; (ii) a language study, not in the student's native language,

Electrical and Electronic Engineering candidates shall select, with the approval of the Degree Programme Director, optional modules with a total value of 30 credits from LISTS 1, 3, 4 and 5.
Note at least 10 credits must be selected from LIST 1 during Stages 3 or 4

Electronic Engineering candidates shall select, with the approval of the Degree Programme Director, optional modules with a total value of 30 credits from LISTS 1, 2, 3 and 4.
Note at least 10 credits must be selected from LIST 1 or 2 during Stages 3 or 4

Electronic Communications candidates shall take the following compulsory modules:

Module code	Credit	Descriptive Title
EEE403	10	Data Communications and Signals
EEE416	10	Advanced Communication Systems

and

shall select, with the approval of the Degree Programme Director, optional modules with a total

value of 10 credits from LIST 1 and 3.

Stage 4 of the course is structured such that students are able to spend the first semester away from the university. Many students spend this time in industry but it is also possible to work

with research groups or at a university abroad (these activities can extend back into the preceding summer vacation period). Students take further technical and non-technical modules in Stage 4. A major activity for these MEng students is a group project. Project activities relate to real engineering problems, the group is run as a small business venture with a defined product specification to be fulfilled within a budget.

Refs: http://www.newcastle.ac.uk/calendar/regulations.html for degree programme regulations
http://www.ncl.ac.uk/eece/undergrad/handbooks.htm for links to relevant handbook and module pages

12. Support for Students

Services and facilities available to students include the following:

- Personal Tutor;
- Degree Programme Director;
- Year Tutor (stage manager);
- Student/staff ratio of 17.4.
- Induction activities for each stage;
- Study skills instruction in Stage 1 and University Web based materials;
- Library visits and instruction;
- Web based information including, Degree Programme Handbook Degree Regulations and Module sheets;
- University Computing Service facilities (including extensive PC and UNIX provision, software applications, e-mail and internet access);
- University (Robinson) Library, including search facilities and inter-library loans;
- Private study area in Merz Court
- Extensive laboratories;
- IEE Counsellor
- University Housing Office (which makes an offer of University accommodation to each first year student);
- University Careers Service;
- University Counselling Service;
- University Language Centre;
- Students' Union services, including societies, refectories and Student Advice Centre, further student refreshment and social areas are available in Merz Court;
- Centre for Physical Recreation and Sport;
- Student Progress Office;
- International Office;
- University Chaplaincy;
- Saville Medical Practice.

Ref: Degree Programme Handbook: http://www.ncl.ac.uk/eece/undergrad/handbooks.htm
Undergraduate Prospectus 2003: http://www.ncl.ac.uk/undergraduate/
Newcastle University and You: http://www.ncl.ac.uk/student-support/FSWA.htm
University Student Handbook 2003;
Student Welfare Handbook http://www.ncl.ac.uk/student-support/welfare.htm
Student Accommodation 2003/2004 http://www.ncl.ac.uk/accommodation/
Careers Service Guide 1999; http://www.careers.ncl.ac.uk/students/pages/login.asp
UCS: http://www.ncl.ac.uk/ucs/
The Language Centre http://www.ncl.ac.uk/langcen/
Newcastle University Library http://www.ncl.ac.uk/library

13. Criteria for Admission

Admission offers normally exceed the UK Engineering Council "SARTOR" minimum requirements for M.Eng. for Chartered Engineer status (i.e. UK GCE A-level grades ABB, including Mathematics and Science) for Stage 1 admission. In addition, the University recruits candidates with a wide range of equivalent qualifications based on its knowledge of SARTOR equivalents and other international qualifications. A limited number of international qualifications and HND holders with appropriate subjects and grades may be considered for direct entry to Stage 2. Exceptionally, suitably qualified candidates may be taken into Stage 3 of the 4-year M.Eng. programme.

Engineering requires a wide range of attributes and abilities, so selection is not solely based on academic grades. Selectors seek evidence of motivation and commitment from the Personal Statement and Reference on UCAS forms and applicants are required to attend for interview whenever possible.

Notwithstanding adherence to SARTOR standards, the Department is committed to widening access, particularly for "late developers". Links exist with the Engineering Access Course at Newcastle College and there is a Faculty Foundation Year (Stage 0) for those with insufficient science and mathematics to enter Stage 1 directly. Limited numbers of places may be available to Regional candidates through the University's "Partners Programme". All UCAS forms, including Late or Summer applications are considered, as well as candidates through Clearing.

M.Eng. candidates who, on entry, do not satisfy the SARTOR requirements are asked to pass Stage 2 "with Merit" to enter Stage 3 of the M.Eng degree. Those who fail to satisfy this requirement are transferred to Stage 3 of the B.Eng degree. This is made possible by the common material taught in the first two years of the B.Eng and M.Eng degree programmes.

14. Methods of evaluating and improving the quality and standards of teaching learning and assessment

Mechanisms for review

- Subject review
- Degree Programme Review
- Module Review (including University Questionnaire Service returns)
- Graduating Student Questionnaire.
- Graduate Questionnaire (sent out two years after graduation)
- Stage Review Meetings
- Annual Revision of Regulations
- Annual Revision of Module Sheets
- Accreditation Reports
- HEFCE/QAA Reports
- External Examiners' Reports to VC
- Student/Staff Committee
- Stage 1 Small Group Tutorials
- Industrial Advisory Board
- Staff Meetings
- Student Representation on Committees
- Board of Studies
- Personal Tutors

Committees with responsibilities for quality and standards

- University Teaching and Learning Committee (UTLC)
- Faculty Teaching and Learning Committee (FTLC)
- Faculty Policy & Resources Committee (for resource issues)
- Board of Studies (BoS)
- School Teaching and Learning Committee (STLC)
- School Executive Board (SEB) (for resource issues)
- School Staff/Student Committee
- Board of Examiners (BoE)

Staff Development activities

- All new staff complete Certificate in Learning & Teaching
- Performance and Development Review (PDR)
- Annual Board of Studies review of module delivery
- Annual Peer Review of Lecture Presentation

The following internal documentation is maintained:

: Preparing for Subject Review
: Guidelines for Taught Programme Review 1999
: Module Boxes,
: STLC minutes,
: Web based documentation, http://www.ncl.ac.uk/eece/
: I.E.E. Accreditation report, 2003
: HEFCE Quality Assessment Report 1997
: FTLC Minutes
: FP&RC confidential Minutes, maintained by Faculty Asst. Registrar
: BoS. Minutes file,
: Staff/Student Minutes
: Exam. Board Minutes.

15. Regulation of Standards

Assessment rules

- The Assessment rules are given in the "Undergraduate Examination Conventions". (http://www.ncl.ac.uk/calendar/university.regs/ugexamconv.html)
- The minimum pass mark is normally 40%.
- There is limited compensation for marks of 35-40% at all but the final Stage.
- Candidates for all but the final Stage may normally sit assessments on up to three occasions.
- All Honours candidates must complete a Stage before proceeding to the next.

Honours Classification

- Stages 3 and 4 contribute equally to the Honours classification
- The rules for the award of Honours are given in the "Undergraduate Examination Conventions"
- The Faculty awards degrees by *The Averaging Method* as specified in the Undergraduate Examination Conventions. Subject to the other provisions of those Conventions, the link between marks and classification is as given below:

Mark	Class of Honours
<40	Fail
40-49	Third Class
50-59	Second Class, Second Division
60-69	Second Class, First Division
70+	First Class

Role of the External Examiner

The External Examiners are involved in all Stages of assessment.

- Approval of Examination Papers
- Vetting in-course assessments and examination scripts
- Interviewing a selection of candidates prior to the June Examination Board
- Attending the June Board and participating in its deliberations
- Reviewing any subsequent special cases, either by correspondence or in special circumstances by subsequent visits to Newcastle.
- Returning a confidential report to the VC.

16. Indicators of Quality and Standards

- Annual External Examiners' Reports (School and FTLC reviews)
- Accreditation Reports
- Annual review of student destinations
- Annual Module and Stage Review process reported to Board of Studies
- Staff / Student Committee Minutes reviewed by Board of Studies
- Annual FTLC review of Faculty intake (by School) against SARTOR standards
- Annual FTLC review of Faculty Stage 1 progression (by School)
- Annual FTLC review of student feedback questionnaires.
- Biennial UTLC "Taught Programme Review"
- Quinquennial UTLC "Subject Review"

Warning

This specification provides a concise summary of the main features of the programme and the learning outcomes that a typical student might reasonably be expected to achieve if they take advantage of the opportunities provided. More detailed information on the specific learning outcomes, indicative content and teaching, learning and assessment can be found in the Degree Programme Handbook and other University documentation.

The information from this document may be selectively extracted and included in documents that are more appropriate for non-academic audiences, for example, students, intending students and employers.

Module Matrix for MEng in Electrical and Electronic Eng or Electronic Eng

Stage 1

Module code	Credit	Descriptive Title	Know.	Intellectual ability	Pract. skills	Transf skills
EEE101	10	Electromagnetism I	O	O	O	O
EEE102	10	Circuit Theory	O	O	O	O
EEE103	10	Analogue Electronics I	O	O	O	O
EEE104	10	Physical Electronics I	O	O	O	O
EEE105	10	Electromagnetic Devices	O	O	O	O
EEE106	10	Digital Electronics I	O	O	O	O
EEE107	10	Linear Systems and Signals I	O	O	O	O
EEE122	5	Computer Engineering I	O	O	O	O
EEE109	10	Project	O	O	O	O
EEE121	5	Communication Studies	O		O	O
CSC601	10	Introduction to C++	O	O	O	O
ENM105	20	Engineering Mathematics I	O	O		O

Stage 2

Module code	Credit	Descriptive Title	Know.	Intell. abilit.	Pract. skills	Trans .skills
EEE201	10	Electromagnetism II	O	O	O	O
EEE202	10	Linear Systems and Signals II	O	O	O	O
EEE203	10	Analogue Electronics II	O	O	O	O
EEE204	10	Digital Electronics II	O	O	O	O
EEE205	10	Automatic Control	O	O	O	O
EEE206	10	Electrical Systems and Machines	O	O	O	O
EEE207	10	Communications	O	O	O	O
EEE209	10	Computer Engineering II	O	O	O	O
EEE210	10	Project	O	O	O	O
EEE212	5	Project management	O	O	O	O
CSC603	10	Hardware/Software Interfaces	O	O	O	O
ENM226	5	Discrete Transforms	O	O		O
EEE208	10	Physical Electronics II	O	O	O	O
EEE213	10	Information Theory and Coding	O	O	O	O
MMM221	10	Mechanical Engineering A	O	O		O

Stage 3/4

Module code	Credit	Descriptive Title	Know.	Intell. ability	Pract. skills	Transf. skills
EEE350	40	Individual project and Dissertation including exercises in Communication Skills	O	O	O	O
EEE351/2	10	Study Project	O	O	O	O
ENG201	10	Introduction to Business Management	O	O	O	O
EEE301	10	Control Systems	O	O		O
EEE302	10	Fields	O	O		O
EEE303	10	Electrical Machines	O	O		O
EEE304	10	Power Electronics	O	O		O
EEE305	10	Digital Signal Processing	O	O		O
EEE306	10	Analogue systems	O	O		O
EEE307	10	Radio Wave Engineering	O	O		O
EEE308	10	Digital electronics III	O	O	O	O
EEE309	10	Industrial Automation	O	O	O	O
EEE314	10	Embedded Systems	O	O	O	O
EEE401	10	Electric Drives	O	O		O
EEE402	10	Design Tools for Digital Systems	O	O		O
EEE403	10	Data Communications and Signals	O	O		O
EEE404	10	Design of VLSI Systems	O	O		O
EEE405	10	Image Processing and Machine Vision	O	O	O	O
EEE406	10	Design of Machines and Drives	O	O		O
EEE407	10	Power System Operation and Control	O	O		O
EEE408	10	Telecommunications	O	O		O
EEE409	10	Optoelectronics	O	O		O
EEE410	10	Satellite Engineering	O	O		O
EEE411	10	Digital Control	O	O		O
EEE412	10	Computer Engineering III	O	O		O
EEE413	10	Power Transmission Engineering	O	O		O
EEE414	10	Semiconductor Devices	O	O		O
EEE415	10	Semiconductor Fabrication	O	O		O
EEE416	10	Advanced Communication Systems	O	O		O
ENG402	10	Management of New Product Introduction	O	O		O
MMM221	10	Mechanical Engineering A	O	O		O
MMM380	10	Mechanical Engineering B	O	O		O
EEE450	30	Industrial/Research Project with Report	O	O	O	O
EEE451	10	Technical Review with Report	O	O		O
EEE424	30	Group Design Project with Report	O	O	O	O
EEE422/3	10	Extended coursework on Applications and Design	O	O	O	O
EEE454	10	Elective Module (Overseas)	O	O	O	O