

**PROGRAMME SPECIFICATION**

1	<b>Awarding Institution</b>	Newcastle University
2	<b>Teaching Institution</b>	Newcastle University
3	<b>Final Award</b>	MSc
4	<b>Programme Title</b>	Microelectronics
5	<b>UCAS/Programme Code</b>	5060
6	<b>Programme Accreditation</b>	IET
7	<b>QAA Subject Benchmark(s)</b>	N/A
8	<b>FHEQ Level</b>	7
9	<b>Date written/revised</b>	April 2011

**10 Programme Aims**

The programme aims:

- To gain an advanced knowledge and understanding of specialist topics in Microelectronics.
- To develop transferable skills in research and knowledge acquisition.
- To satisfy the professional development needs of the individual and his/her employers; providing relevant training to engineering graduates who wish to pursue a career as design and development engineers in the design, test and fabrication of microelectronic devices or systems.
- To provide a foundation for further postgraduate studies.

**11 Learning Outcomes**

The programme provides opportunities for students to develop and demonstrate knowledge, understanding, skills and other attributes associated with the theme of Microelectronics.

**Knowledge and Understanding**

A successful student will have gained and be able to demonstrate:

- A1 A knowledge and understanding of a total of 7 advanced topics in the field of Microelectronics selected from: System-on-Chip Test Strategies, Semiconductor Electronic Devices, Semiconductor Device Fabrication, Advanced VLSI Design, Reconfigurable Hardware Design, Signal Processing and Estimation, Mobile and Cellular Communications, Optoelectronics and Power Electronics.
- A2 The technical expertise that underpins informed project planning, design and decision making in the area of Microelectronics
- A3 Computer aided design and analysis techniques appropriate to Microelectronics, for example the use of software packages such as CADENCE
- A4 A particular topic connected with Microelectronics studied in-depth as part of a research or design project

**Teaching and Learning Methods**

Acquisition of A1 to A4 is through a combination of lectures, tutorials, student centred learning, coursework and project work

<b>Assessment Strategy</b>
<p>The primary means of assessing factual knowledge is through closed book written examination. This is supported through assessed coursework and case studies.</p> <p>In depth individual learning forms part of the project, which is assessed by a literature survey, a presentation exercise, dissertation and <i>viva-voce</i> examination.</p>
<b>Intellectual Skills</b>
<p>On completing the programme students should be able to:</p> <p>B1    Select and apply appropriate methods for modelling and analysing problems in Microelectronics</p> <p>B2    Produce engineering solutions to problems in microelectronics through the application of knowledge, understanding and scientific principles.</p> <p>B3    Create new designs in Microelectronics through synthesis of ideas from a wide range of sources</p> <p>B4    Develop ideas and opinions through the critical appraisal of information from a wide range of sources</p>
<b>Teaching and Learning Methods</b>
Acquisition of B1 to B4 is through a combination of distance learning, intensive residential courses, coursework and project work.
<b>Assessment Strategy</b>
Intellectual abilities are assessed through a mixture of written examinations, coursework assignments. The project, which is assessed by dissertation and <i>viva voce</i> examination, provides evidence of the ability to carry out a project.
<b>Practical Skills</b>
<p>On completing the programme students should be able to:</p> <p>C1    Use relevant test and measurement equipment</p> <p>C2    Use software packages relevant to Microelectronics</p> <p>C3    Plan, execute and report a project</p> <p>C4    Design a system or component in selected areas of Microelectronics</p> <p>C5    Search for and retrieve information from a wide range of sources</p>
<b>Teaching and Learning Methods</b>
Acquisition of C1 to C5 is through a combination of distance learning, intensive residential courses, coursework and project work
<b>Assessment Strategy</b>
C1 to C5 are not explicitly assessed but are necessary for successful completion of coursework and project

<b>Transferable/Key Skills</b>
<p>A successful student will be able to:</p> <p>D1 Communicate effectively</p> <p>D2 Critically appraise information from a wide range of sources</p> <p>D3 Create and innovate in problem solving</p> <p>D4 Use general IT tools such as word processors, spreadsheets</p> <p>D5 Manage time and resources</p>
<b>Teaching and Learning Methods</b>
<p>D1 to D5 are introduced and developed via a combination of tutorial examples, coursework and project work</p>
<b>Assessment Strategy</b>
<p>Skills D1 to D3 are necessary to complete examinations and assignments to a satisfactory standard.</p> <p>Skills D4 and D5 are essential for satisfactory completion of the project.</p>

<b>12 Programme Curriculum, Structure and Features</b>
<b>Basic structure of the programme</b>
<p>The course comprises 105 taught credits, plus 15 credits of laboratory based coursework. MSc students also complete an individual project with dissertation (60 credits).</p> <p>The course is offered once per year in a three semester structure with all lectured material being in semesters 1 and 2. The project will take place in Semester 3.</p>
<b>Key features of the programme</b>
<p>This programme is aimed at students who wish to pursue advanced studies in the area of Microelectronics.</p> <p>Advanced knowledge and understanding (A1 to A3) of specialist topics in Microelectronics are gained primarily through the selected modules. This is reinforced through tutorial exercises and coursework assignments</p> <p>Intellectual abilities (B1 to B4) are introduced through the chosen modules and are reinforced through tutorial exercises and coursework assignments. Tutorial exercises and coursework assignments also develop practical skills (C1, C2, C4, C5) and transferable skills (D1 to D5)</p> <p>The project involves individual acquisition of knowledge and abilities (A2 to A4, B1 to B4), project planning and execution (C3). Experience is also gained of practical skills (C1 to C5). Satisfactory completion of the dissertation and examination requires command of the transferable skills (D1 to D5).</p>
<b>Programme regulations</b>
<p><a href="http://www.ncl.ac.uk/regulations/programme/">http://www.ncl.ac.uk/regulations/programme/</a></p>

### **13 Criteria for admission**

#### *Entry qualifications*

Students should normally have at least a 2.2 honours degree in electrical engineering (or equivalent). A lower qualification may be considered if applicant has a significant period of relevant industrial experience.

#### *Level of English Language capability*

6 IELTS or equivalent.

### **14 Support for Student Learning**

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

#### *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. The International Office offers an additional induction programme for overseas students.

#### *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.

Numeracy support is available through Maths Aid and help with academic writing is available from the Writing Development Centre (further information is available from the Robinson Library).

#### *Academic and Pastoral support*

Each undergraduate and taught postgraduate student will be assigned a personal tutor.\* A personal tutor is one part of a wider network of advice and guidance available to students to support their personal and general academic development. The module leader acts as the first point of contact for subject-specific academic advice. Thereafter the Degree Programme Director or Head of School may be consulted. Issues relating to the programme may be raised at the Student-Staff Committee, and/or at the Board of Studies. Within the academic unit, students may also receive additional academic and pastoral advice from a range of other student-facing staff including degree programme directors, dissertation/project supervisors, and administrative support staff.

\*Arrangements may vary for students taking special types of provision.

The University also offers a wide range of institutional services and support upon which students can call, such as the Writing Development Centre, Careers Service and Student Wellbeing Service. This includes one-to-one counselling and guidance or group sessions / workshops on a range of topics, such as emotional issues e.g. stress and anxiety, student finance and budgeting, disability matters etc. There is specialist support available for students with dyslexia and mental health issues. Furthermore, the Student Union operates a Student Advice Centre, which can provide advocacy and support to students on a range of topics including housing, debt, legal issues etc.

#### *Support for students with disabilities*

The University's Disability Support team provides help and advice for disabled students at the University - and those thinking of coming to Newcastle. It provides individuals with: advice about the University's 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.

#### *Learning resources*

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

All new students whose first language is not English are required to take an English Language Proficiency Test. This is administered by INTO Newcastle University Centre on behalf of Newcastle University. Where appropriate, in-session language training can be provided. The INTO Newcastle University Centre houses a range of resources which may be particularly appropriate for those interested in an Erasmus exchange

### **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 Teaching and Learning Committee. Student opinion is sought at the Student-Staff 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.

#### *Programme reviews*

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

#### *External Examiner reports*

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

#### *Student evaluations*

All modules, and the degree programme, are subject to review by student questionnaires. Informal student evaluation is also obtained at the Student-Staff 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 Student-Staff Committee and the Board of Studies.

#### *Faculty and University Review Mechanisms*

Every six years degree programmes in each subject area undergo periodic review. This involves both the detailed consideration of a range of documentation, and a review visit by a review team (normally one day in duration) which includes an external subject specialist and a student representative. Following the review a report is produced, which forms the basis for a decision by University Learning, Teaching and Student Experience Committee on whether the programmes reviewed should be re-approved for a further six year period.

*Accreditation reports*

*Additional mechanisms*

## **16 Regulation of assessment**

### *Pass mark*

The pass mark is 50%

### *Course requirements*

Progression is subject to the University's Masters Degree Progress Regulations, Taught and Research and Examination Conventions for Taught Masters Degrees. There are reassessment opportunities, with certain restrictions. Limited compensation up to 40 credits of the taught element and down to a mark of 40% is possible for candidates who commenced their programme in 2013/14 or earlier. For students starting their programme in 2014/15 or later, no compensation is possible.

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

#### **Summary description applicable to postgraduate Masters programmes**

<50	Fail
50-59	Pass
60-69	Pass with Merit
70 or above	Pass with Distinction

#### **Summary description applicable to postgraduate Certificate and Diploma programmes**

<50	Fail
50 or above	Pass

### *Role of the External Examiner*

An External Examiner, a distinguished member of the subject community, is appointed by Faculty Teaching and Learning 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

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

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

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

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.

## Annex

### Mapping of Intended Learning Outcomes onto Curriculum/Modules

Intended Learning Outcome	Module codes (Comp/Core in Bold)
A1	EEE8004, EEE8018, EEE8019, EEE8020, EEE8076, <i>plus optional modules</i>
A2	EEE8097, EEE8076
A3	EEE8004, EEE8018, EEE8019, EEE8020, EEE8076, <i>plus optional modules</i>
A4	EEE8097
B1	EEE8004, EEE8018, EEE8019, EEE8020, EEE8076, EEE8097, <i>plus optional modules.</i>
B2	EEE8097, EEE8076, EEE8073
B3	EEE8097, EEE8076, EEE8073
B4	EEE8097
C1	EEE8097, EEE8076, EEE8073
C2	EEE8097, EEE8076, EEE8073
C3	EEE8097, EEE8076
C4	EEE8097, EEE8076, EEE8073
C5	EEE8097
D1	EEE8097, EEE8076, EEE8073
D2	EEE8097, EEE8073
D3	EEE8097, EEE8076, EEE8073
D4	EEE8097, EEE8073
D5	EEE8097, EEE8076