

**PROGRAMME SPECIFICATION**

<b>1</b>	<b>Awarding Institution</b>	Newcastle University
<b>2</b>	<b>Teaching Institution</b>	Newcastle University
<b>3</b>	<b>Final Award</b>	MSc
<b>4</b>	<b>Programme Title</b>	Communications and Signal Processing
<b>5</b>	<b>UCAS/Programme Code</b>	5066
<b>6</b>	<b>Programme Accreditation</b>	IET
<b>7</b>	<b>QAA Subject Benchmark(s)</b>	
<b>8</b>	<b>FHEQ Level</b>	7
<b>9</b>	<b>Date written/revised</b>	April 2011

**10 Programme Aims**

The programme aims:

- To gain advanced knowledge and understanding of specialist topics in Communications and Signal Processing;
- 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 area of telecommunications and digital signal processing;
- 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 Communications and Signal Processing.

**Knowledge and Understanding**

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

- A1 Knowledge and understanding of a total of 6 advanced topics in the field of Communications and Signal Processing selected from: Signal Processing and Estimation, Mobile and Cellular Communications, Advanced Modulation and Coding Techniques, Advanced Multimedia Systems, Advanced VLSI Design, Wired and Wireless Network Technologies, Biometrics and Recognition, RF Engineering
- A2 The technical expertise that underpins informed project planning, design and decision making in the area of Communications and Signal Processing
- A3 Computer aided design and analysis techniques appropriate to Communications and Signal Processing, for example the use of software packages such as MATLAB, Simulink, NS2, VHDL, OPNET, COMSOL, VisualDSP++, ADS, PSpice
- A4 A particular topic connected with Communications and Signal Processing studied in-depth as part of a research project

<b>Teaching and Learning Methods</b>
Acquisition of A1 to A4 is through a combination of lectures, tutorials, student centred learning, coursework and project work.
<b>Assessment Strategy</b>
Formative assessment in particular areas occurs through tutorial exercises (computer based and written) and coursework. The primary means of assessing factual knowledge is through closed book written examination. This is supported through assessed coursework and case studies.  In depth individual learning forms part of the research project, which is assessed by a literature survey, a presentation exercise, dissertation and <i>viva-voce</i> examination.
<b>Intellectual Skills</b>
On completing the programme students should be able to:  B1 Select and apply appropriate methods for modelling and analysing problems in Communications and Signal Processing.  B2 Use scientific principles in the modelling and analysis of engineering systems, processes and products.  B4 Select and apply appropriate methods for developing Communications and Signal Processing solutions to practical problems.  B5 Produce engineering solutions to problems through the application of knowledge and understanding in Communications and Signal Processing.  B6 Create new designs in Communications and Signal Processing through synthesis of ideas from a wide range of sources.  B7 Develop ideas and opinions through the critical appraisal of information from a wide range of sources.
<b>Teaching and Learning Methods</b>
Acquisition of B1 to B5 is through a combination of lectures, tutorials, coursework and project work.
<b>Assessment Strategy</b>
<i>Intellectual</i> abilities are assessed through a mixture of written examinations, coursework assignments. The research project, which is assessed by dissertation and <i>viva voce</i> examination, provides evidence of the ability to carry out a research project
<b>Practical Skills</b>
On completing the programme students should be able to:  C1 Use relevant test and measurement equipment.  C2 Use software packages relevant to Communications and Signal Processing.  C3 Plan, execute and report a research project.  C4 Design a system or component in selected areas of Communications and Signal Processing.  C5 Search for and retrieve information from a wide range of sources.

**Teaching and Learning Methods**

Acquisition of C1 to C5 is through a combination of distance learning, intensive residential courses, coursework and project work.

**Assessment Strategy**

C1 to C5 are not explicitly assessed but are necessary for successful completion of coursework and project.

**Transferable/Key Skills**

A successful student will be able to:

- D1 Communicate effectively.
- D2 Critically appraise information from a wide range of sources.
- D3 Create and innovate in problem solving.
- D4 Use general IT tools such as word processors, spreadsheets.
- D5 Manage time and resources.

**Teaching and Learning Methods**

D1 to D5 are introduced and developed via a combination of tutorial examples, coursework and project work.

**Assessment Strategy**

*Skills* 1 to D3 are necessary to complete examinations and assignments to a satisfactory standard  
*Skills* D4 and D5 are essential for satisfactory completion of the project.

**12 Programme Curriculum, Structure and Features**

**Basic structure of the programme**

The course comprises 75 taught credits, plus 45 credits of laboratory based coursework. MSc students also complete an individual project with dissertation (60 credits).

The course is offered once per year in a three semester structure with all lectured material and the coursework based modules being in semesters 1 and 2. The project will take place in Semester 3.

**Key features of the programme**

This programme is aimed at students who wish to pursue advanced studies in the area of Communications and Signal Processing.

Advanced knowledge and understanding (A1 to A3) of specialist topics in Communications and Signal Processing are gained primarily through the selected modules. This is reinforced through tutorial exercises and coursework assignments.

Intellectual abilities (B1 to B6) 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).

The research project involves individual acquisition of knowledge and abilities (A2 to A4, B1 to B5), project abilities (B1 to B6) are introduced through the chosen modules and are reinforced through tutorial exercises, coursework assignments. Tutorial exercises and coursework assignments also develop practical skills (C1, C2, C4, C5) and transferable skills (D1 to D5) 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).

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

<http://www.ncl.ac.uk/regulations/programme/2012-2013/eece.php>

**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: [www.ncl.ac.uk/students/](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 Centre (further information is available from the Robinson Library).

*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 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 the University offers a range of support services, including 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 Union Society 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 Service 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 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.

*Accreditation reports*

This programme is accredited by the Institute of Engineering and Technology.

## 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. NB: For the purpose of professional accreditation, the University's Teaching, Learning and Student Experience Committee has approved a variation in Postgraduate (Taught) Examination Convention K.35 to the effect that limited compensation of only 20 credits, of the taught element and down to a mark of 40%, 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 (see <http://www.ncl.ac.uk/postgraduate/>)

The School Brochure (contact [enquiries@ncl.ac.uk](mailto:enquiries@ncl.ac.uk))

The University Regulations (see <http://www.ncl.ac.uk/regulations/programme/2011-2012/eece.php>)

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.

## Mapping of Intended Learning Outcomes onto Curriculum/Modules

Intended Learning Outcome	Module codes (Comp/Core in Bold)
A1	<b>EEE8001, EEE8002, EEE8003</b> , plus optional modules
A2	<b>EEE8097</b>
A3	<b>EEE8001, EEE8002, EEE8003</b> , plus optional modules
A4	<b>EEE8097</b>
B1	<b>EEE8001, EEE8002, EEE8003, EEE8097</b> , plus optional modules
B2	<b>EEE8001, EEE8002, EEE8003, EEE8097, EEE8091</b> plus optional modules
B3	<b>EEE8076, EEE8077, EEE8091, EEE8092, EEE8097</b>
B4	<b>EEE8076, EEE8077, EEE8091, EEE8092, EEE8097</b>
B5	<b>EEE8097</b>
B6	<b>EEE8097</b>
C1	<b>EEE8076, EEE8077, EEE8091, EEE8092, EEE8097</b>
C2	<b>EEE8001, EEE8003, EEE8076, EEE8077, EEE8091, EEE8092, EEE8097</b>
C3	<b>EEE8097</b>
C4	<b>EEE8076, EEE8077, EEE8091, EEE8092, EEE8097</b>
C5	<b>EEE8097</b>
D1	<b>EEE8076, EEE8077, EEE8091, EEE8092, EEE8097</b>
D2	<b>EEE8076, EEE8077, EEE8091, EEE8092, EEE8097</b>
D3	<b>EEE8076, EEE8077, EEE8091, EEE8092, EEE8097</b>
D4	<b>EEE8076, EEE8077, EEE8091, EEE8092, EEE8097</b>
D5	<b>EEE8097</b>