UNIVERSITY OF ULSTER

COURSE SPECIFICATION

COURSE TITLE:
BEng (Hons) Electronics and Computer Systems with Diploma in Industrial Studies.
BEng (Hons) Electronics and Computer Systems.

PLEASE NOTE. This specification provides a concise summary of the main features of the course and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he or she takes full advantage of the learning opportunities provided. More detailed information on the specific learning outcomes, content and the learning, teaching and assessment methods of each module can be found in the Programme Handbook.

1. AWARDING INSTITUTION/BODY: UNIVERSITY OF ULSTER
2. TEACHING INSTITUTION: UNIVERSITY OF ULSTER
3. LOCATION: MAGEE
4. COURSE ACCREDITED BY: None
5. FINAL AWARD: BEng (Hons) Electronics and Computer Systems with Diploma in Industrial Studies, BEng (Hons) Electronics and Computer Systems
6. MODE OF ATTENDANCE: Full and Part-time
7. SPECIALISMS: Electronics and Computing
8. UCAS CODE: GH66
9. QAA SUBJECT UNIT: Engineering/Computing
10. EDUCATIONAL AIMS AND OBJECTIVES OF THE COURSE

The course aims to prepare students for a career in professional electronic/computer engineering. It seeks to produce students with a high level of proficiency and sound understanding of the integration of software and hardware system design. These skills will instil in the intended electronic and computer engineer a thorough knowledge of electronic engineering and computing principles and practice, together with an appreciation of the industrial or business environment in which they will work.

At the end of their course graduates of the B.Eng (Hons) Electronics and Computer Systems will have:

- An understanding of the fundamental principles underpinning the disciplines of electronic and computer engineering environment
- A sound comprehension of the integration of electronic engineering and computing design procedures.
- Competence in the use of high and low level languages and software tools for the production of the software components.
- The ability to identify, specify and design reliable cost-effective systems composed of hardware and software, to satisfy the needs of a commercial, industrial or administrative organisation.
- Capability in appreciating and interpreting contemporary developments in standards, protocols and network architectures.
- Familiarity with the instrumentation used in modern electronic and computer systems design and a proficiency in their utilisation.
- Studied selected areas of system specialisms through project work and final year options.
- Received sufficient knowledge of current electronic and computer engineering practice as to enhance employment opportunities on graduation.
The course provides opportunities for students to achieve and demonstrate the following learning outcomes.

*Reference points used in defining the learning outcomes where the QAA Engineering/Computing subject benchmark statement (2000) (B) and the British Computer Society Guidelines on Course Exemptions and Accreditation (2001) (P)*

### 11A SUBJECT LEARNING OUTCOMES

#### Knowledge and Understanding of:

<table>
<thead>
<tr>
<th>A1</th>
<th>Basic engineering and computing principles that are fundamental to electronic engineering (B/P).</th>
</tr>
</thead>
<tbody>
<tr>
<td>A2</td>
<td>The integration of software and hardware which is fundamental to electronic system design (B/P).</td>
</tr>
<tr>
<td>A3</td>
<td>The economic, environmental, human and social impacts of electronics (B).</td>
</tr>
<tr>
<td>A4</td>
<td>The impact of electronics in economic development and the engineering and information technology marketplace (B).</td>
</tr>
<tr>
<td>A5</td>
<td>The tools enabling electronic system design (B).</td>
</tr>
</tbody>
</table>

**Learning and Teaching Methods:** Lectures, Tutorials, Seminars and Practical sessions

**Assessment Methods:** Course work, written unseen examinations

### 11B INTELLECTUAL QUALITIES

#### Able to:

<table>
<thead>
<tr>
<th>B1</th>
<th>Analyse problems and design solutions (B).</th>
</tr>
</thead>
<tbody>
<tr>
<td>B2</td>
<td>Integrate electronic and computing theory with the available technologies (B/P).</td>
</tr>
<tr>
<td>B3</td>
<td>Integrate information and data from a variety of sources (B).</td>
</tr>
<tr>
<td>B4</td>
<td>Plan, conduct and report a programme of original research (B).</td>
</tr>
<tr>
<td>B5</td>
<td>Apply computing science fundamentals to the comprehension and evaluation of advanced hardware and software technologies (B/P).</td>
</tr>
</tbody>
</table>

**Learning and Teaching Methods:** Lectures, tutor directed tutorials, student-led seminars, supervised practical sessions and self-directed learning employing study packs and research based materials

**Assessment Methods:** Course work related to case studies and projects, written unseen examinations, workbooks, presentations, project reports and dissertation
11C  PROFESSIONAL / PRACTICAL SKILLS

Able to:

C1  Apply electronic and computing studies skills in the development and realisation of relevant case studies (B/P).

C2  Design and carry out a programme of practical exercises using modern electronic system design technologies (B).

C3  Prepare and interpret electronic system problems specifications and reports (B).

C4  Source and use technological information (B).

C5  Utilise a range of engineering and computing tools across a variety of engineering applications (B/P).

C6  Develop hands-on experience of basic electronics and computing technologies as encountered in an industrial context (B).

Learning and Teaching Methods: Lectures, Tutorials, problem based seminars and practical sessions, Project preparation and implementation

Assessment Methods: Problem based course work, workbooks, project reports and dissertation.

11D  TRANSFERABLE/KEY SKILLS

Able to:

D1  Learn in both familiar and unfamiliar situations making effective use of information retrieval skills and learning resources (B).

D2  Communicate effectively using various media and with a variety of audiences (B).

D3  Apply numeracy in both understanding and presenting cases involving a quantitative aspect (B).

D4  Apply engineering principles to engineering problems (B).

D5  Manage one's own learning and development including time management, organisational skills and awareness of entrepreneurship issues (B).

Learning and Teaching Methods: Lectures, Tutorials, Seminars and practical sessions, Project preparation and implementation.

Assessment Methods: Workbooks, project vivas, reports and dissertation.
12. COURSE STRUCTURE AND REQUIREMENTS FOR THE AWARD

The B.Eng (Hons) Electronics and Computer Systems course provides wide access entry whereby students who do not meet the year 1 entry requirements can access the course by successfully completing all Level A modules (see course structure diagram). Students that meet the year 1 (Level 1) entry requirements embark on a four year programme of study where years 1, 2 and 4 are spent at the university and year 3 is a period of industrial placement.

The course structure is centered on three broad themes: Electronics, Programming and Embedded Systems and Computing Systems. Years 1 and 2 consist of a set of compulsory modules addressing these themes, enabling students to achieve the basic competencies in hardware/software system design. Year 1 consists of 120 points at Level 1 and Year 2 120 points at Level 2.

[All students normally spend Year 3 on placement, working in industry for a minimum period of 30 weeks. On satisfactory completion of the placement period the student is eligible for the award of Diploma in Industrial Studies-DIS]

Year 4 consists of one compulsory 30 point project module, one compulsory 10 point module and four optional modules, all at Level 3. The project module enables the student to engage in a substantive piece of work comprising both theoretical and practical elements at an advanced level. Students may elect to do a broad range of topics or specialise in one or two designated areas, such as Embedded Systems, Digital Signal Processing or Intelligent Systems.

Satisfactory completion of each pre-final year of the course is normally a pre-requisite for progression to the subsequent year. Satisfactory completion of Year 4 leads to the award of the degree with Honours. Pass requirements and honours classifications are detailed in section 16 below.
Course Structure Diagram
(including module title, credit level, credit points).

All L1 and L2 modules are compulsory

Level A

S 1
Introduction to programming
Introduction to Internet and Multimedia Technology
Introduction to Mathematics for Computing

S 2
Business Information Systems
Introduction to Computer Systems
Introduction to Electronics

Themes for B.Eng

Level 1

S 1
Algorithmic Programming 1 (20/B)
Computer Architecture and Organisation (20/B)
Mathematics 1 (20/B)

S 2
Algorithmic Programming 2 (20/B)
System Analysis and Design (20/B)
Analogue and Digital Electronics (20/B)

Level 2

S 1
Prof. Iss (10/C)
Info. Ent. (10/C)
Emb. Sys. Programming
Mathematics 2 (20/C)

S 2
Data & Networked Comms (20/C)
Microprocessor System Design (20/C)
Electronic System Design (20/C)

Industrial Placement (for award of DIS)

Level 3

S 1
Option 1 (20/D)
Project (30/D)
Vis.Prog (10/D)
Option 3 (20/D)

S 2
Option 2 (20/D)

L. 3 Options (20/D)

Intelligent Systems S1
Digital Signal Processing S1
Programmable Logic Systems S1
Embedded Systems Design S2
Mixed Signal Design S2
Wireless Communication systems S2

These options are constantly under review by the Course Committee and may change depending on the availability of staff, staff research interests or Industry requirements. However, the Course Committee is committed to providing an option suite that will ensure that students have access to modules that deliver knowledge and expertise consistent with the domains of electronics and/or computer systems.
13. SUPPORT FOR STUDENTS AND THEIR LEARNING

Students and their learning are supported in a number of ways:
- An Induction Programme for new students is held throughout the first 6 weeks of Semester One. This Programme includes talks by the Course Director covering ‘What is expected of you’ and tours of the library given by library staff.
- A Course website provides an electronic version of the student handbook (including this document), electronic noticeboard with daily notices and links to other on-line resources (Academic Affairs, Careers, Library etc)
- Every student receives a hard copy of the Student handbook (incorporating this document)
- Students are supported by Extensive library and other learning resources
- The School of Computing and Intelligent Systems is resourced by a number of state-of-the-art computer laboratories with a wide range of software. New software is introduced as required per semester.
- All modules have an associated Website with on-line learning support material (module specification, lecture notes, useful web links etc)
- Student e-mail accounts and full access to the Internet
- Each student is allocated a personal Studies Advisor
- Placements unit dedicated to preparing students for placements and finding placement opportunities for students
- Academic staff visit students on placement
- Advertised availability hours for academic staff

14. CRITERIA FOR ADMISSION TO THE COURSE

Applicants must satisfy the University’s general entry requirements and specific requirements for admission to the course are detailed below:

Level A and 1 entry
Refer to regulations for Undergraduate courses

Level 2 entry
Direct entry to Level 2 of the programme is at the discretion of the Course Director.

EVALUATING AND IMPROVING THE QUALITY AND STANDARD OF LEARNING

Mechanisms for review and evaluation of teaching, learning, assessment, the curriculum and outcome standards
Module reviews (student questionnaires and teaching team report)
Annual staff reviews
Annual Programme review prepared by the Programme team
Peer teaching observations and feedback

Committees with responsibility for monitoring and evaluating quality:
Staff Student Consultative Committee
Course committee
Board of Examiners
School Board (includes student members)
Faculty Teaching and Learning Committee (includes student members)
University Teaching and Learning Committee.
16. **REGULATION OF STANDARDS**

**Assessment rules:** The programme is subject to the relevant regulations given in the School’s “Regulations for Undergraduate Courses”.

17. **INDICATORS OF QUALITY RELATING TO LEARNING AND TEACHING**

- The course is due to be accredited by the BCS in 2002 for the period 2002-2007
- Computing Science in the Faculty of Informatics is scheduled to undergo a QAA Subject Review during 2002.
- In the 2001 Research Assessment Exercise the Faculty of Informatics achieved a grade 4.
<table>
<thead>
<tr>
<th>Modules</th>
<th>Outcomes</th>
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<tbody>
<tr>
<td><strong>TITLE</strong></td>
<td>CODE</td>
</tr>
<tr>
<td>Level A</td>
<td></td>
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<tr>
<td>Introduction to Internet &amp; Multimedia (C)</td>
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<tr>
<td>Introduction to Programming (C)</td>
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</tr>
<tr>
<td>Business Information Systems (C)</td>
<td>✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓</td>
</tr>
<tr>
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<tr>
<td>Introduction to Computer Systems (C)</td>
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<tr>
<td>Computer Architecture and Organisation (C)</td>
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<td>Systems Analysis and Design (C)</td>
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<td>Analogue and Digital electronics (C)</td>
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<td>Professional Issues (C)</td>
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<td>Embedded Systems Programming (C)</td>
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<tr>
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