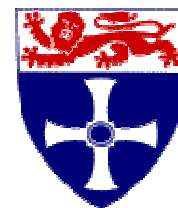


UNIVERSITY OF  
NEWCASTLE UPON TYNE

FACULTY OF  
SCIENCE, AGRICULTURE & ENGINEERING

DEGREE PROGRAMME SPECIFICATION

UNIVERSITY OF  
NEWCASTLE



1. Awarding Institution	University of Newcastle upon Tyne
2. Teaching Institution	University of Newcastle upon Tyne
3. Final Award	MSc
4. Programme Title	System Design for Internet Applications
5. Programme Accredited by:	British Computer Society
6. UCAS Code	N/A
7. QAA Benchmarking Group(s)	Computing
8. Date of production/revision	28/9/04

9. Programme Aims:

- To equip students with the broad range of skills and knowledge required for designing advanced Internet Applications. These skills will enable graduates of the course to design, build and extend the Internet infrastructure and use it to design a variety of distributed applications in the fields of scientific computing, electronic commerce, education, entertainment, information and service brokerage to name just a few.
- To provide a programme which meets the FHEQ at Masters level and which takes appropriate account of the draft subject benchmark statements in Computing.

10. Intended Learning Outcomes; Teaching and Learning Strategies and Methods; Assessment Strategies and Methods

A Knowledge and understanding

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

- A1. Programming tools and techniques necessary for structuring Internet applications
- A2. Web and Grid services middleware
- A3. Java/CORBA component middleware
- A4. Fundamental algorithms of distributed systems
- A5. Information management
- A6. Design, implementation, testing and validation of distributed applications
- A7. Techniques for improving security of network-based applications
- A8. Future trends in networked information systems

*Teaching & Learning Strategy*

The primary means of imparting knowledge and understanding (A1-A8) is through lectures, associated coursework and project work. The course is based on a mixture of taught modules and project work.

Taught module: a given course module is either a traditional taught module involving lectures supplemented by laboratory course work or a continually assessed, seminar-based guided reading module (that enforces A8), involving extensive student participation. Independent learning is encouraged through the provision of reading lists, literature reviews and critical analysis of research papers, and ready access to online information resources. Adequate time is provided in all modules for private study for independent learning.

*Assessment strategy*

Knowledge and understanding are assessed by unseen written examinations, student seminars and associated reports, coursework, group project reports and associated computer programs and an individual dissertation (A1-A8).

**B Subject-specific/professional skills**

A successful student will:

- B1. Be able to carry out and write up an extended research project involving where appropriate a literature review, problem specifications, design, implementation, and analysis.
- B2. Be familiar with the process of software development
- B3. Have expertise in the use and applicability of up-to-date software development tools.
- B4. Be able to design and implement new applications by composing and extending existing software components, services and applications.
- B5. Be able to analyse system requirements and the production of system specifications.

*Teaching & Learning Strategy*

B2-B5 feature prominently in all modules; the group project in particular requires students to work in teams and develop a working system. The individual project during the second half of the course requires students to carry out and write up an extended research project involving where appropriate a literature review, problem specification, design, implementation, and analysis (B1-B5).

*Assessment strategy*

B1-B5 are assessed by coursework consisting of reports plus computer programs, group project reports, plus individual dissertation.

**C Cognitive skills**

A successful student will be have the ability to:

- C1. Critically evaluate research and literature relating to networking, distributed applications
- C2. Use and evaluate appropriate tools and techniques
- C3. Undertake critical evaluation (both theoretical and empirical) of alternative solutions
- C4. Solve system design problems

*Teaching & Learning Strategy*

Problem-solving skills feature in all modules since all involve an amount of coursework (C4). This is especially so in the group and individual projects where students need to select, evaluate and apply appropriate tools and techniques (C2). Here and elsewhere students will need to investigate possible alternatives in the technical and professional literature (C1, C3).

Cognitive skills are developed through seminars, and individual and group projects.

*Assessment strategy*

C1-C4 are assessed by unseen written examinations, student seminars and associated reports, coursework, group project reports and associated computer programs and individual dissertation.

## **D Key (transferable) skills**

A successful student will have skills in:

- D1. Oral communication in English
- D2. Written communication
- D3. Use of computer based literacy resources
- D4. Working as part of a team
- D5. Creativity
- D6. Planning and organisation

The above covers the generic knowledge and understanding, subject/specific/professional skills, cognitive skills and key (transferable) skills of a 'typical' Masters level graduate, although for each individual student there will be variations depending on the dissertation taken during the second half of the course.

### *Teaching & Learning Strategy*

Oral presentation skills are exercised by group discussions during group project exercises, and by the preparation of oral presentations on specific research topics (D1). Written communication skills are developed during independent study, the preparation of coursework, web page design, poster presentation and through the completion of the research project proposal and the project thesis (D2). Formal lectures and practicals address the use of online literacy resources and research techniques, reinforced through the use of practical exercises (D3). The group project develops team skills, creativity, planning and organisation (D4, D5, D6). The preparation and execution of the individual project address creativity, planning and organisation skills (D5, D6).

### *Assessment strategy*

D1-D6 are assessed through coursework, the group and individual projects, and student seminars.

## 11 Programme Features, Structure and Curriculum

### A & B Programme Features & Structure

All modules are compulsory. The course has 180 Credits.

The full-time version of the course will last one whole year and will be split in two halves. The first half, from mid-September to March comprises taught components covering the generic subject areas required in an MSc: advanced knowledge, transferable and personal skills and team working culminating in a group project. In addition, students will undertake preparatory work for their individual systems projects. The second half will be taken up entirely by the individual systems project work with dissertation. Subject to agreement with industry, the project work can be undertaken with a sponsoring company.

The first half of the course is composed of seven taught modules of 10 credits each, one 5-credit seminar-based guided reading module and a 15-credit group project module.

### C Programme Curriculum

#### Degree of Master of Science in System Design for Internet Applications

**Code: 5056**

Candidates shall take the following compulsory modules:

<i>Code</i>	<i>Credits</i>	<i>Descriptive title</i>
CSC820	(10)	Internet Programming
CSC821	(10)	System Security
CSC822	(10)	Distributed Algorithms
CSC823	(10)	Enterprise Distributed Computing
CSC824	(10)	Information Management
CSC825	(10)	System Design
CSC826	(10)	System Validation
CSC828	(5)	Recent developments in the Internet and Web
CSC829	(15)	Group Project
CSC898	(90)	Individual Project and Dissertation

**Development of specific Intended Learning Outcomes** occurs through the following modules (all modules are compulsory)

A1	Programming tools and techniques necessary for structuring Internet applications	<b>CSC820, CSC821, CSC823.</b>
A2	Web and Grid services middleware	<b>CSC823, CSC824, CSC898.</b>
A3	Java/CORBA component middleware	<b>CSC823.</b>
A4	Fundamental algorithms of distributed systems	<b>CSC822.</b>
A5	Information management	<b>CSC824.</b>
A6	Design, implementation, testing and validation of distributed applications	<b>CSC825, CSC826, CSC829.</b>
A7	Techniques for improving security of network-based applications	<b>CSC821.</b>
A8	Future trends in networked information systems	<b>CSC828.</b>
B1	Carry out and write up an extended research project involving where appropriate a literature review, problem	<b>CSC898.</b>

	specifications, design, implementation, and analysis.	
B2	Familiar with the process of software development.	CSC825.
B3	Have expertise in the use and applicability of up-to-date software development tools.	CSC820, CSC823, CSC826.
B4	Design and implement new applications by composing and extending existing software components, services and applications.	CSC823, CSC824.
B5	Analysis of system requirements and the production of system specifications	CSC825.
C1	Critically evaluate research and literature relating to networking, distributed applications	CSC828, CSC898.
C2	The ability to use and evaluate appropriate tools and techniques	CSC829, CSC898.
C3	The ability to undertake critical evaluation (both theoretical and empirical) of alternative solutions	CSC898.
C4	The ability to solve system design problems	CSC829, CSC898.
D1	Ability to communicate orally in English	CSC828, CSC898.
D2	Written communication	CSC820, CSC821, CSC822, CSC823, CSC824, CSC825, CSC826, CSC828, CSC898.
D3	Ability to use computer based literacy resources	CSC820, CSC821, CSC822, CSC823, CSC824, CSC825, CSC826, CSC828, CSC898.
D4	Ability to work as part of a team	CSC829.
D5	Creativity skills	CSC829.
D6	Planning and organisation	CSC829, CSC898.

## 12 Criteria for Admission:

The MSc is intended for graduates with a first degree in computing science (minimum 2(ii) standard) or mature candidates with relevant industrial experience (typically, industrial experience that qualifies the candidate to membership of the British Computer Society is considered sufficient).

### Admissions policy

Suitable applicants are made an offer without interview. Selection is performed in two batches: in February and in April.

### Any Additional Requirements

None

## 13 Support for Students and their Learning:

### Induction

The first week of the first term/semester is an Induction Week with no formal teaching. During this period all students attend an induction programme in which they will be given detailed programme information relating to their course and the timetable of lectures/practicals/labs/ tutorials/etc. In particular all new students will be given general information about the School and their course, as described in the Degree Programme Handbook. The International Office offers an additional induction programme for overseas students (see [http://www.ncl.ac.uk/international/coming\\_to\\_newcastle/orientation.phtml](http://www.ncl.ac.uk/international/coming_to_newcastle/orientation.phtml)).

### 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 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. Details of the personal tutor system can be found at <http://www.ncl.ac.uk/undergraduate/support/tutor.phtml>. In addition the University offers a range of support services, including the Student Advice Centre, the Student Counselling Service, the Mature Student Support Service, and a Childcare Support Officer, see <http://www.ncl.ac.uk/undergraduate/support/welfare.phtml>.

#### *Support for Special Needs*

Support for students with special needs is provided as required and the University's Disability Support Service can be consulted where appropriate. For further details see <http://www.ncl.ac.uk/undergraduate/support/disability.phtml>.

#### *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, see <http://www.ncl.ac.uk/undergraduate/support/acfacilities.phtml>.

All new students whose first language is not English are required to take an English Language test in the Language Centre. Where appropriate, in-session language training can be provided. The Language Centre houses a range of resources for learning other languages which may be particularly appropriate for those interested in an Erasmus exchanges. See <http://www.ncl.ac.uk/undergraduate/support/langcen.phtml>.

The School of Computing Science has well equipped computer laboratories consisting of networked PCs. Key software used in the support and delivery of the programme is available to students free of charge. A workstation room for the exclusive use of these students has been made available. The School has its own library which is mainly used for the support of advanced topics and is a particularly valuable resource for individual projects.

## **14 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 School Teaching and Learning Committee and at the Board of Studies. 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 Teaching and Learning Committee.

#### *Programme reviews*

The Board of Studies conducts an Annual Monitoring and Review of the degree programme and reports

to Faculty Teaching and Learning Committee.

#### *External examiner reports*

External Examiner reports are considered by the Board of Studies under Reserved Business, in the absence of the student representatives. The Board responds to these reports through Faculty Teaching and Learning Committee.

#### *Accreditation reports*

Accreditation was sought from the BCS at its visit in November 2003 and subsequently provisionally approved. Advanced Masters graduates are entitled to Professional Graduate Diploma and PGD Project Exemption.

#### *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.

#### *Feedback mechanisms*

Feedback to students is effected 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 programme, see <http://www.ncl.ac.uk/internal/academic-quality/qualityhome.htm#2>.

## **15 Regulation of Assessment:**

#### *Pass Marks*

The pass mark, as defined in the University's Postgraduate Examination Conventions (<http://www.ncl.ac.uk/calendar/university.regs/tpmdeprexamconv.pdf>), is 50.

#### *Course Requirements*

Progression is subject to the University's Postgraduate Progress Regulations (<http://www.ncl.ac.uk/calendar/university.regs/tpmdepr.pdf>) and Postgraduate Examination Conventions (<http://www.ncl.ac.uk/calendar/university.regs/tpmdeprexamconv.pdf>).

#### *Common Marking Scheme*

The University employs a common marking scheme, which is specified in the Postgraduate Examination Conventions (<http://www.ncl.ac.uk/calendar/university.regs/tpmdeprexamconv.pdf>), namely

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

#### *Role of the External Examiner*

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

- See and approve examination papers
- Moderate examination and coursework marking
- Attend the June/October Board of Examiners

## **16 Indicators of Quality and Standards:**

### **Professional Accreditation Reports**

The course has been provisionally accredited by the British Computer Society.

### **Internal Review Reports**

This programme was covered by the Internal Subject Review of the School of Computing Science held on 28/29th April 2003 and was subsequently approved by Faculty Teaching and Learning Committee and University Teaching and Learning Committee.

The overall judgement was that “The team was impressed by the very positive relationships between the staff and students in the School - it was abundantly clear that the subject group is very student-focused and this was to their significant credit, with students commenting favourably about the approachable nature of the staff as a whole. The overall provision was felt to be excellent, with a significant number of commendations relating to good practice in the School, which others may wish to consider and incorporate into their own procedures.”

### **Previous QAA Reports**

This programme was not running in the last QAA subject review of Computing Science in 1994.

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.

## **17 Other Sources of Information:**

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

The School Prospectus (see <http://www.ncl.ac.uk/postgraduate/subjects/computing> )

The University and Degree Programme Regulations (see <http://www.ncl.ac.uk/calendar/university.regs/tpmdepr.pdf> and <http://www.ncl.ac.uk/calendar/university.regs/tpmdeprexamconv.pdf>).

The Degree Programme Handbook <http://www.cs.ncl.ac.uk/degrees/pg/sdia/SDIA2004.html>

QAA Subject Review Report