# PROGRAMME SPECIFICATION

| | | |
|---|---|---|
| **Programme title:** | MSc Data Communications, Networks and Distributed Systems | |
| **Final award (BSc, MA etc):** (where stopping off points exist they should be detailed here and defined later in the document) | MSc | |
| **Cohort(s) to which this programme specification is applicable:** (e.g. from 2008 intake onwards) | From 2002 | |
| **Awarding institution/body:** | University College London | |
| **Teaching institution:** | University College London | |
| **Faculty:** | Engineering Sciences | |
| **Parent Department:** (the department responsible for the administration of the programme) | Computer Science | |
| **Departmental web page address:** (if applicable) | http://www.cs.ucl.ac.uk/teaching/dcnds/ | |
| **Method of study:** Full-time/Part-time/Other | Full-time | |
| **Criteria for admission to the programme:** | Please see http://www.cs.ucl.ac.uk/teaching/dcnds/admissions.html | |
| **Length of the programme:** (please note any periods spent away from UCL, such as study abroad or placements in industry) | One calendar year (approx). | |
| Level on Framework for Higher Education Qualifications (FHEQ) (see Guidance notes) | M | |
| **Relevant subject benchmark statement (SBS)** (see Guidance notes) | Not applicable. There is currently no Master's level benchmark statement for this subject area. | |
| **Brief outline of the structure of the programme and its assessment methods:** (see guidance notes) | Please see http://www.cs.ucl.ac.uk/teaching/dcnds/syllabi.html and http://www.cs.ucl.ac.uk/teaching/dcnds/exams.html | |
| **Board of Examiners:** | Board of Examiners in Data Communications, Networks and Distributed Systems | |
| **Professional body accreditation (if applicable):** | BCS and IET | Date of next scheduled accreditation visit: 2010/2011 |

**EDUCATIONAL AIMS OF THE PROGRAMME:**

The MSc DCNDS programme has been running successfully since 1986 and was one of the world's first advanced MSc programmes in the areas suggested by its title. It flows directly from the research interests of a substantial part of the department, which has a proud history in this area. It remains the only research-driven course with this particular emphasis within the UK and is one of few worldwide. Consequently, it attracts high numbers of quality applicants and produces high-quality graduates who then populate the networking world at all levels from commercial system development through to research leaders.

The educational aims of the programme remain as they have been for the past 16 years. Fundamentally, our aim is to accept high quality applicants from across the world, challenge them both academically and organisationally, and produce world-class graduates capable of taking up responsible positions within industry or of undertaking further research. We do this in several ways: we provide primary material which is updated regularly to reflect our perception of both current practice and future importance; we ensure that the students obtain exposure to industrial and commercial constraints through a seminar series delivered largely by industry; and we provide opportunities for students to put both academic and project management skills into practice in a series of individual and group activities, including a substantial group project.

**PROGRAMME OUTCOMES:**

*The programme provides opportunities for students to develop and demonstrate knowledge and understanding, qualities, skills and other attributes in the following areas:*

**A: Knowledge and understanding**

| **Knowledge and understanding of:** | → | **Teaching/learning methods and strategies:** |
|---|---|---|
| The Bateson Learning 0/I objectives for the MSc DCNDS include the development of an understanding of fundamental principles of:<br><br>1. computer networking, including protocol design, application domains and measurement and analysis techniques.<br><br>2. distributed systems, including issues of security.<br><br>3. new media and delivery mechanisms<br><br>4. mobile and wireless systems<br><br>However, we seek not to concentrate on fact accumulation and, whilst we provide the required material in this area, we actively encourage deeper approaches to learning than simple regurgitation. | | Although we seek not to concentrate on surface approaches to learning, we recognize that foundational material is essential, particularly given the wide spread of backgrounds in our intake. Whilst we only admit students of high quality, the course is very international and different students come with different prior experiences.<br><br>We deliver primary material through lectures and discussions within class time. However, we expect students to engage in self-directed study, both before arriving on the course and throughout the duration of the course itself. Both lecturers and the course director make themselves available to discuss issues of individual concern throughout the year. |

| | | |
|---|---|---|
| | → | **Assessment:**<br><br>Assessment of base-level material is through unseen written examination.<br><br>The remainder of our assessment process concentrates on application, analysis, synthesis and evaluation; the upper levels of Bloom's taxonomy. Understanding is therefore also assessed implicitly through coursework, group presentations, and the project assessment process. As part of the overall assessment of the summer project, there is an oral examination. |
| **B: Skills and other attributes** | | |
| **Intellectual (thinking) skills:**<br><br>We seek actively to encourage the development of Bateson Learning II (and III, insofar as this has real meaning), which involves the contextualisation of Learning I (and II). This involves the need to:<br>1. Reason critically, particularly in relation to problems that are constrained by practical considerations.<br>2. Analyse, compare and evaluate system behaviour using both numerical techniques and those based on argumentation.<br>3. Consider ethical issues. We would like this to lead to reflection on what it means for each individual to adopt their given positions, but this is hard to ensure.<br>4. Reflect on experiences gained by applying knowledge and practical techniques in the solution of problems. | → | **Teaching/learning methods and strategies:**<br><br>These skills are developed largely as a result of in-class discussions, interactive industrial seminars, project supervision, and other face-to-face meetings.<br><br>The techniques are formulated orally, and applied both orally and in writing. |

| | | |
|---|---|---|
| | → | **Assessment:**<br><br>The bulk of our assessment is concerned with testing the understanding of the students through application of knowledge, both practically and intellectually. Consequently, all our assessment procedures seek to encourage the skills identified:<br><br>Unseen written examinations include both those that are subject-based and a paper that covers broader thinking across subject areas and ethical and professional issues.<br><br>Coursework is either practical, or analytical. If not practically based, it may involve one or more of:<br>*1.* application of academic principles in unfamiliar situations<br>*2.* research<br>*3.* synthesis of solutions<br>*4.* critical analysis of the above<br><br>In the case of the summer project, it is expected that students critique both the efforts of the group and of each individual (including themselves). Further, they are asked to critique the project management techniques they are taught. |

| C: Skills and other attributes | | |
|---|---|---|
| **Practical skills (able to):**<br><br>Given the nature of the subject and our expected outcomes, we consider practical ability in the field to be essential. Consequently, we address this on several fronts – we require students to be able to:<br><br>1. Locate and analyse appropriate literature<br>2. Plan and undertake practical exercises both individually and within a small group<br>3. Organise the development of infrastructure and testing on a whole-class basis<br>4. Present the results of practical work in written form, in formal presentations, and in individual oral examination.<br>5. Construct both individual programs and systems of significant size<br>6. Critically evaluate their solutions | → | Practical skills are taught throughout the year, starting in induction week, and proceeding through courses that are assessed either wholly or partially on the basis of practical coursework, to the final group-based summer project.<br><br>Students receive initial guidance on research techniques, and early formative assessment of their practical abilities, on which individually tailored remedial work is planned in order to bring students up to the required standard.<br><br>Students are expected to apply practical skills in many of the course modules; however, one half-unit course is entirely dedicated to the practical development of systems, and involves both individual and group elements in its assessment.<br><br>In preparation for the summer group project, students undertake a course on which a practitioner teaches them project management techniques. They make use of this course in planning their projects.<br><br>The summer group project is one in which a practical problem, drawn either from the industrial/commercial or the research domain, is undertaken by a group of (normally) 4-5 students. Students meet regularly with academic supervisors and are asked to adhere to their plan, produce agreed deliverables, and present and defend their work on a weekly basis. Some groups may also have industrial supervisors, with whom they are expected to interact. |

| | | |
|---|---|---|
| | → | **Assessment:**<br><br>Assessment of practical skills takes place through a mixture of routes:<br><br>For most courses where there is a practical element, it is assessed through coursework. Much of this coursework involves programming and/or data analysis.<br><br>For that part of the taught course that is assessed solely by coursework, the assessment involves formal specification; practical programming, together with interoperability testing within a group; presentations; and written material.<br><br>The project management part of the course is assessed by group presentations during the summer, the presentations being based on an application of the techniques learned to the summer group project in which the students are engaged.<br><br>Finally, the summer group project is assessed by written report (both group and individual) and by individual oral examination involving an internal assessor (not the project supervisor) and an external examiner. In addition to an explanation and analysis of the work conducted, the requirements for documentation also require students to reflect on both project management and on their role within the group as well as the role of others. Unassessed (but compulsory) presentations/demonstrations are conducted after the submission of the written documentation. |

| D: Skills and other attributes | | |
|---|---|---|
| **Transferable skills (able to):**<br><br>1. Manage time effectively<br>2. Structure and communicate ideas, practical solutions, and test data in a coherent accessible way<br>3. Analyse data<br>4. Research and analyse ideas and solutions<br>5. Develop and deliver coherent presentations<br>6. Work effectively both independently and within a group | → | The programme is (intentionally) rather pressured. Consequently, after an initial briefing on time management, and with the aid of pre-published deadlines, students are expected to organize themselves in such a way that they can complete the given work within the time available. We continuously monitor student performance, and provide support as required.<br><br>Data analysis is not commonly viewed as a transferable skill. However, we assert that this is indeed the case and data analysis is a fundamental part of our programme.<br><br>All courses require regular coursework, and feedback is given on this in order to develop understanding of the core material, argumentation and research skills where appropriate, and logical and clear presentation.<br><br>Presentations form part of the assessment process for several courses, and, indeed, form part of the teaching process for at least one of the courses.<br><br>There are activities that require individual effort, those that require effort as part of a group and those that require both. In the case of activities involving groups, supervision is provided. However, given the maturity of the individuals involved in the course, it is expected that such supervision is restricted to guidance and advice so far as actual group working is concerned and, in practice, this is usually the case. |
| | → | **Assessment:**<br>Time management is not assessed directly; however, it is an implicit part of coursework, and explicitly a part of project work.<br><br>A requirement to communicate ideas and describe the structure and efficacy of practical solutions are spread throughout the course in all forms of assessment.<br><br>Data analysis is assessed through coursework and, where appropriate, through project work.<br><br>Both presentations and group work are a key part of the assessment of several different courses. |

The following reference points were used in designing the programme:

- the Framework for Higher Education Qualifications (http://www.qaa.ac.uk/academicinfrastructure/benchmark/default.asp);
- the programme specifications for UCL degree programmes in relevant subjects (where applicable);
- UCL teaching and learning policies;
- staff research.

**Please note:** 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 and demonstrate if he/she takes full advantage of the learning opportunities that are provided. More detailed information on the learning outcomes, content and teaching, learning and assessment methods of each course unit/module can be found in the departmental course handbook. The accuracy of the information contained in this document is reviewed annually by UCL and may be checked by the Quality Assurance Agency.

| | |
|---|---|
| **Programme Organiser(s) Name(s):** | Professor Mark J Handley |
| **Date of Production:** | November 2002 |
| **Date of Review:** | April 2008 |
| **Date approved by Head of Department:** | TBA |
| **Date approved by Chair of Departmental Teaching Committee:** | TBA |
| **Date approved by Faculty Teaching Committee** | TBA |