# UNIVERSITY OF KENT

# PROGRAMME SPECIFICATION

**1. Award and title[1]**
PhD/MPhil in Computer Science
MSc/Postgraduate Diploma in Computer Science (by research)

**2. Length and mode of registration**
PhD: three years full-time; five years part-time.
MSc: one year full-time; two years part-time.

**3. Entry requirements**
PhD: First or upper second class honours in a first degree in computer science or a related discipline; or a similar level of qualification in a conversion masters degree in computer science.
MSc: First or second class honours in a first degree in computer science or a related discipline; or a similar level of qualification in a conversion masters degree in computer science.
Students are required to meet the UoK criteria for competence in English and to provide references for their academic achievements and potential for research.

**4. Anticipated Total Student Registrations**
Current registrations are approximately 40 FTE students, the vast majority of which are registered for the PhD. It is hoped to expand this to some 70 students: an average of two per FTE member of lecturing staff.

**5. Programme Management**
Director of Graduate Studies
Admissions officer
Academic administrative support (Computing Laboratory Course Administration Office)
Research Support Administrator

**6. Proposed Start Date**
This programme has been running since the 1970s.

**7. Opportunity and Need**
It is central to the University's mission and the Departmental plan to pursue research to an internationally recognised standard, and a vital aspect of this is the training of research students.
As evidence of need the recent increase in registrations from some 25 FTEs to the current level of 40 FTEs should be noted.

**8. Aims and Objectives**
From the MSc and PhD regulations for the University of Kent …

In order to be eligible for the award of the degree of Master of Science by research and thesis a candidate is required to show in the thesis ability to conduct an independent study and to understand its relationship to a wider field of

[1] The department does not recruit to the MPhil nor to the Postgraduate Diploma but wishes to retain the option to award these qualifications to candidates who do not meet the requirements for award of PhD or MSc respectively.

knowledge. The candidate is also required to show appropriate ability in the organisation and presentation of the material in the thesis.

The [PhD] thesis should be an original contribution to knowledge or understanding in the field under investigation and should demonstrate the candidate's ability to test ideas, whether his/her own or those of others, and to understand the relationship of the theme of the investigation to a wider field of knowledge. It should be of such scholarly merit as would on that ground justify its publication either as submitted or in an abridged form. The candidate is also required to show appropriate ability in the organisation and presentation of his/her material in the thesis

Research work in computing science covers an extremely broad spectrum. The general criterion of 'an original contribution to knowledge or understanding' can be interpreted in a number of contexts.

- In a mathematical context, such as programming language semantics, the criteria would be to formulate definitions and to prove results about those definitions, and derive counterexamples to conjectured properties.
- In an engineering context, the aim is to build a system to solve a particular problem. Here a solution technique should be original, but it is equally important that the artefact produced is evaluated in a rigorous way, and that its requirements are elicited using appropriate techniques.
- In a scientific context, it is appropriate that any experiments undertaken -- either on systems or human participants -- are designed using appropriate methodologies. Moreover, the account of the work should reflect upon the design of the experimental work, in its particular context.

Any paticular thesis may combine these approaches, and indeed also draw on other disciplines, such as sociology and psychology, for its standards.

In undertaking this the student is expected to be able to demonstrate:

1. The ability to recognise and validate problems
2. Original, independent and critical thinking, and the ability to develop theoretical concepts;
3. A knowledge of recent advances within one’s field and in related areas;
4. An understanding of relevant research methodologies and techniques and their appropriate application within one’s research field;
5. The ability to critically analyse and evaluate one’s findings and those of others;
6. An ability to summarise, document, report and reflect on progress.

## 9. Programme Outline

### 9a. Research training

Students follow a training programme in their first year of registration. The programme, which has been run since September 2001, has three components:

- A weekly **postgraduate workshop**, with the following learning outcomes that at the end of the programme a student should:
    - Appreciate the difficulties that can arise during a research degree and how to overcome them
    - Be able to confidently present research material to peers
    - Be aware of various techniques that can help support research
    - Be aware of the wider research picture in the Computing Laboratory and how that relates to their own work.
- The workshop also includes a sub-programme on **teacher training**, based on the series of books *Learning to Teach* by David and Carole Baume, published by the Oxford Centre for Staff and Learning Development, Oxford Brookes University.

Some research students undertake undergraduate teaching in the department.

- A one-week **intensive course**, module CO863 Research Methods and Issues, also delivered to the Advanced MSc in Distributed Systems and Networks. By taking this module students will:
    - understand the nature of research and be able to frame a research question;
    - be able to plan a research project: this will include being able to perform an analysis of a research topic to identify (i) objectives for the research, (ii) prior research in the area, (iii) the value of the research in terms of possible outcomes and (iv) the probable methodology, action plan or approach to the research;
    - be able to document their analysis in the form of a reasoned argument;
    - be able to read and critically review a research paper, and give a presentation about a research topic;
    - gain an introductory understanding of the nature of intellectual property, and be able to use a variety of resources to gather information.

  This module is delivered in early November of each academic year.

Student attendance and participation in research training is monitored by a register at each session.

In the second year students undertake a poster presentation. Assessment criteria is published and feedback is provided to the student. The presentation can feed into the "Prestigious Paper Award" scheme which is run by the department.

Final year students receive a talk from the university Career's Advisory Service. Topics covered include:

- Introduction to the Careers Advisory Service facilities
- How employers view computing postgraduates - the present state of the IT job market
- What jobs are open to Computing postgraduates.
- How and when to apply
- Postgraduate CVs

**9b. Other courses**
Health and safety training is a component of the postgraduate workshop. In their first year of registration students are given the opportunity to participate in an outdoor activities course, which promotes a team ethos in the cohort of students.

**9c. Progression milestones**
Students registered for the PhD (or MSc students wishing to transfer to the PhD programme) are required to submit a mini thesis after some nine months of (full-time) registration, and after some twelve to fifteen months in the part-time case. The mini thesis should contain a review of existing work in their proposed research area as well as an outline proposal for their programme of research work. Approval of the mini thesis by the supervision panel (see Section 12) is a pre-requisite for continued registration or transfer to the PhD programme. Cases in which the panel fails to approve the mini thesis are considered by the Graduate Studies Committee (or by the Director of Graduate Studies under chair's action).

**9d. Assessment method**
Both PhD and MSc students write a thesis embodying their research work. The work is examined by an internal and external examiner whose appointments are made according to university criteria: PhD students will generally be given a *viva voce* examination; MSc students will usually not be *viva*ed.

**10. Approved supervisors**
10.1 Supervisors are approved by the Faculty Research and Enterprise Committee in accordance with Annex C of the Code of Practice for Quality Assurance (Research Students).
10.2 Supervision panel arrangements (see section 12) ensure that less experienced staff can receive appropriate supervision support.

**11. Research Environment**
The Computing Laboratory is a broad-based research centre that has engaged in postgraduate research training since the 1970s. In research assessment exercises the department has consistently achieved a grading of four, denoting evidence international/national recognition.
The department has five research groups

Theoretical Computer Science (TCS)
Networks and Distributed Systems (NDS)
Systems Engineering (SE)
Applied and Interdisciplinary Informatics (AII)
Computers and Education (CompEd)

which form the focus for research work in the department. Each member of research active staff is a member of at least one group, but many staff participate in the work of more than one group, and inter-group work is encouraged. Every research student will join the research group of their supervisor(s).
Each research group organises its own seminar series for internal and external speakers, and other *ad hoc* groups (functional programming, cognitive science) also meet on a regular basis.

Support for all full time research students includes £500 a year to spend on academic conference travel, as well as a PC or laptop on their own desk in a research office. Research students have free access to university facilities such as printing, photocopying, a well provisioned Library and high bandwidth internet links. Their research is performed within well integrated, active research groups which have internal seminars and activities. Students are guided by one to one supervision and have further structured input and advice from a panel of academics. Research students attend teaching development and research issues courses in their first year, and if they wish, can gain professionally and financially by teaching on undergraduate programmes."

**12. Student Support and Guidance**
On registration, all students are issued with a copy of the Faculty Handbook "Information for New Postgraduate Students".

**Induction:** An induction day for new research students is held on the first Wednesday in the Michaelmas Term of their first year of registration.

**Supervisor:** The principal source of support is the academic supervisor, a member of staff. Occasionally, when a research topic reaches across research interests there is more than one supervisor. A student meets with their supervisor on a regular basis, for instance once a week.

**Director of Graduate Studies/Deputy Director of Graduate Studies**
The Director of Graduate Studies meets regularly with the student body as a whole. This allows open discussion, as well as a formal mechanism for matters such as the election of student representation.
The Deputy Director of Graduate Studies is available to provide a route whereby students might raise concerns in a more informal forum or to avoid conflict of interest cases where, for example, Director of Graduate Studies' own student has an issue to be resolved.

**Graduate Studies Committee**. The Graduate Studies Committee of the Computing Laboratory is constituted thus:

- Director of Graduate Studies (Head of Research) (committee chair)
- Administrator (committee secretary)
- Head of Department
- Heads/Representatives of Research Groups
- Postgraduate Admissions Officer (Research)
- Research Support Administrator
- Head of Systems Support
- Two student representatives
- Co-opted members (currently none)

The terms of reference of the committee are:

i. To consider admission, recruitment and funding of postgraduate research students in the Laboratory.
ii. To monitor the progress of research students in the Laboratory.
iii. To consider all training and QA issues for Postgraduate Research programmes and to make recommendations to the Computing Board of Studies and the Science, Technology and Medical Studies Faculty Research Committee as appropriate.
iv. To consider and recommend to the Computing Board of Studies and the Faculty Research Committee proposals for new research degree programmes.
v. To act as a forum for discussion of staff/research student liaison issues.

The committee meets twice yearly, typically in late September and late April. In its unreserved business it considers strategic aspects of item i. (above) and all aspects of items iii., iv. and v. Individual aspects of item i. and all aspects of item ii. are considered under reserved business.
The committee reports on student admissions and student progress to the Faculty Research and Enterprise Committee on an annual basis in late September. The Chair and the Postgraduate Admissions Officer represent the department on the Faculty Committee.

**Supervision Panels**. Each student is allocated a supervision panel that consists of their supervisor or supervisors together with two members of academic staff. The head of the student's research group will usually be one member of the panel. The other member of the panel need not be a member of the research group; in the case of research which straddles two groups, the second member should be a member of the second research group.

The terms of reference of the panel are:

i. To monitor the academic progress of the student.
ii. To provide academic advice to the student.
iii. To provide advice to the supervisor, particularly in the case of a less-experienced supervisor.
iv. To advise the Director of Graduate Studies in the case of the breakdown of the relationship between the student and supervisor(s).

v. To report to the Graduate Studies Committee on the student's progress; in the case that progress is unsatisfactory the panel should suggest to the Committee measures to be taken to rectify the situation.
vi. To examine the students mini-thesis (and to report as in item v. above).

Panel members will not usually be involved in day-to-day supervision of the student and may therefore become the internal examiner for the student's thesis. The panel should notify the Director of Graduate Studies in any case where a conflict of interest might be thought to arise.

In the case that a student's sole supervisor leaves the university it is expected that one of the panel members would become the student's supervisor; if this does not happen, the panel would advise the Director of Graduate Studies on a choice of replacement supervisor. In the case of joint supervision, the remaining supervisor(s) would retain the supervisory role.

**Progress monitoring**. Supervision Panels meet with students 3 months after the start of their registration. Thereafter student progress is reviewed every nine months in a meeting with their supervision panel; reports from these meetings are

- either a statement that progress is satisfactory
- or that it is unsatisfactory. In this case the panel makes a recommendation about what corrective action needs to be taken; the panel members and the student sign this off.

Where there are issues of unsatisfactory progress the Graduate Studies Committee can require a supervision panel to meet more frequently with a student and to report on progress.

After some nine months of registration students are required to prepare a mini-thesis; see Section 9c above for details. An evaluation of this thesis forms the report for that reporting period.
Reports from supervision panels are considered by the Laboratory Graduate Studies Committee (details above); unsatisfactory progress can result in the termination of a student's registration or the failure to re-register a student.
In the case of part-time students, or students whose time of registration was not at the start of the academic year, reports will be considered by the Director of Graduate Studies in consultation with the supervision panel.

**Evaluation of supervisor performance**
Research students are asked to comment on supervisors and supervisions. The information is collected using the same timescale (ie every 6 months) as the supervisory panels, but is separate from that process. Information will be passed directly to the Director of Graduate Studies (or his/her Deputy if the student is supervised by the Director) who will liaise with the Head of Department concerning further action or advice to be taken.

**Administrative Support:**

- Research Support Administrator
- Course Administration Office

**13. Departmental Quality Assurance and Enhancement**
The formal mechanism for research student / staff liaison is provided by the two student representatives on the Laboratory's Graduate Studies Committee (see Section 12). Informal liaison is provided by

- weekly interactions in the student workshop (see Section 9a);

- staff/student interactions in joint team-building and social activities;
- student liaison with the Research Support Administrator, who is seen to be independent of the academic staff.

Supervision panels provide a confidential mechanism for mediation between student and supervisor in cases where this is necessary.

The University offers a Postgraduate Certificate in Higher Education (PGCHE) programme. The programme is open to any member of academic staff but is particularly geared to the needs of new members of staff. New academic staff at the University of Kent who are appointed with a probationary period of two years or more are required to register for the programme.

**14. Departmental Resource Implications**

The department's target of 70 FTE research students has resource implications. Whilst the supervision resource is there, these students will not be able to be housed in the Laboratory's current space. The Laboratory currently has no free student accommodation, and it is envisaged that space for some 30 students will need to be found.

It is important that students play a full role in the academic life of the department; it is therefore desirable that this space is contiguous with the remainder of the Laboratory's accommodation.

**15. Professional Accreditation**

Not applicable.

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Relationship of Programme Specification to Skills Training Requirements[2]

| | **Research Skills and Techniques** | **Research Environment** | **Research Management** | **Personal effectiveness** | **Communication Skills** | **Networking and teamworking** | **Career Management** |
|---|---|---|---|---|---|---|---|
| | **A** | **B** | **C** | **D** | **E** | **F** | **G** |
| Undertaking Research | X | | | X | | X | |
| Writing a thesis | | | | X | X | | |
| Postgraduate Workshop | | X | X | | | | X |
| Teacher Training | | | | | X | | |
| CO863 | X | X | X | | | | |
| Poster Presentation | | | | | X | | |
| Careers Talks | | | | | | | X |
| Outdoor activities course | | | | | | X | |
| Induction | | X | | | | | |
| Mini-Thesis | | | | X | X | | |
| Supervisory Panel Discussions | X | | | | X | X | |
| Research Group Seminars | X | X | | | | | |
| Laboratory Seminars | X | X | | | | | |

[2] HEFCE Consultation Paper on Improving standards in Postgraduate Research Degree programmes Annex A Skills Training Requirements for research students: joint statement by the Research Councils/AHRB http://www.hefce.ac.uk/Pubs/hefce/2003/03_23.hm