

Division of Information and Communication Sciences

Discipline Profile - Computing

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1 General Background

Academic staff contribute to the Computing Discipline through scholarship and research; teaching; and professional development and service to the University and community. It is typical for a member of staff to be involved to some extent in all three activities, but a person seeking appointment or promotion would normally be contributing significantly in at least two of them. A PhD is regarded as the usual academic qualification in the Discipline, but appointments are sometimes made to lectureships at Bachelor (Hons) degree level for individuals enrolled in a PhD.

2 Scholarship and Research

Due to the fast changing nature of the discipline's subject matter the main means of publication for basic research is in the refereed proceedings of international conferences and workshops, many of which have an archival status similar to that of refereed journals in other fields. The quality of conferences and workshops is normally measured by the acceptance rate of papers. Top quality conferences usually have acceptance rate no higher than 30-40%. Basic and applied research is also published in appropriate learned refereed journals with wide international circulation.

The extensive publication lead-times of journals and the rapid rate of changes in the discipline also mean that detailed expositions of new research, where this requires more space than is available in a typical conference paper, may be circulated in pre-print form as technical reports (often available in electronic form from the author's web site), with these reports then being referenced in that form in published papers. Contribution to published books, in part or their entirety, is another indicator of scholarship.

Interdisciplinary research is common, involving collaboration with researchers both in other specialist subfields of computing and with researchers outside of the computing discipline. Involvement in basic and applied research is also common, with both theory and practice being developed as a result.

The interdisciplinary nature of much computing research may result in publication in a number of different research areas, and may be distinguished as theoretical or applications-focused. Common too is joint authorship that results from complementary collaboration. Authors are usually listed in order according to their contribution.

Distribution of computer software may be recognized as a form of publication but it is difficult to assess its worth. Requests for copies of the software, and its regular use in other institutions, provide two measures for assessing its quality. The software should be documented in technical reports.

Supervision of research students crosses boundaries between teaching and research and is frequently measured as a one of the significant indicators of research activity in the Department.

The ability to attract grants, industry support and other outside monies is a very positive indicator. The number of competitive grants (such as ARC Discovery or Linkage grants) held is one of the measures of research activity of the Department and individual researchers.

3 Teaching

The teaching responsibilities of academics are determined by the Departmental workload model, which measures the time consumed by a variety of teaching activities. The model is updated regularly to balance the individual's teaching activities with their research and administration activities and the current needs of the Department. A normal teaching load consumes 40% of the time available over the year. This translates into the teaching of one full unit each semester (or alternatively two half units each semester) together with an appropriate mix of tutorials and practicals. Extra time allowances are given to those activities that need additional effort. This includes, for instance, teaching new units, teaching units that are being taught for the first time by the individual in question, or teaching large classes.

Substantial time is devoted to curriculum development as changes in technology continue to bring changes in emphasis on the Discipline's foundations. The Department makes every effort to widen the choice of undergraduate degrees to address emerging industry demands and new employment opportunities.

The Honours program in the Discipline gives undergraduates their first experience in research, and typically is a starting point for PhD study. Academics are expected to undertake supervision of Honours and postgraduate (research) students.

The Department strives to improve the quality of teaching by constant monitoring of key teaching performance indicators. The indicators include, but are not restricted to, regular student evaluations, teaching awards and grants, innovations and contributions in curriculum development, teaching supporting software, publication of textbooks and other teaching materials, invitations to talk at teaching forums and participation in internal or external teaching review panels.

4 Professional Development and Service

The contribution which a staff member makes under this heading is to the professional development of the Discipline, and not simply to his or her own development, although clearly the two may go hand-in-hand.

Acquiring expertise in new cognate fields is an important and valuable form of professional development. In this spirit, consultative work for government agencies, research organisations (such as the CSIRO), or for private industry is a valuable contribution, even though it may not lead to published research. Nevertheless, in such cases one expects that tangible benefits flow through to the Discipline in terms of new

courses or new research programs, and a general culture of broad awareness of the field in its wider context.

Direct involvement with industry and commerce is also important to ensure that our teaching and research programs maintain some relevance to that world. Initiatives taken by staff to develop new programs involving industrial experience for undergraduate students and joint postgraduate course work and research activities are valuable contributions to the Discipline, as are continuing education courses focused on the needs of industry. In some instances staff spend short periods on industrial secondment. Such experience should provide valuable feedback to the Discipline.

The large student numbers require a considerable amount of administrative work to be performed. Administrative staff have been employed to assist with this work at first and second year levels, but many of the tasks and much of the decision making remains with the academics involved with teaching the units. Unit convenors often bear a considerable load in tasks such as maintaining unit web sites, student records, assignment handling and consultation. Sometimes the boundary between teaching and administration is not clear, and this in itself makes passing the task to an administrative assistant difficult. Academics may also be involved in providing innovative and/or automated solutions to administrative problems.

A staff member is required to perform advising, change of program, process waivers and exemptions at the appropriate time periods each semester.

A staff member is expected to participate in the various activities of the Department. Attendance at Department and Division Meetings is expected. Due to the growth in the number of staff members in the Computing Department, it has been found necessary to create a number of committees to handle certain aspects of departmental decision-making. Three committees have been set up: Teaching, Research, and External and Industrial Relations. A staff member is expected to be a member of at least one of these committees. From time to time, special committees are formed to address particular issues such as workload modeling or the development of a curriculum for a new unit.

Organization of conferences, membership on editorial boards of refereed journals, and review of papers, conference submissions, research theses, and research grants are a few examples of the kinds of services a staff member is expected to provide to the community at large.

A staff member is encouraged to be a member of at least one professional association and will often be involved in one of more specific service activities, such as special programs in schools, joint developments with other Disciplines, or the development of the Discipline's (or University's) computing and information systems resources.

5 Requirements for Appointment or Promotion

Academic staff contribute to the Computing Discipline and the University through scholarship and research, teaching, and professional development and service. A person seeking appointment or promotion would normally be contributing significantly in two of these areas. Lesser performance in one area could be offset by

superior performance in two areas or, in exceptional circumstances, by outstanding performance in a single area. At initial appointment, potential rather than actual performance may be accepted on the understanding that actual performance will be required before confirmation of the appointment takes place. A description of good performance for each of the levels of Associate Lecturer, Lecturer, Senior Lecturer, Associate Professor and Professor follows.

5.1 Associate Lecturer

Research and Scholarship

- Completion of a research-based project at Honours or Masters level.
- Enrolment in a PhD or equivalent experience.
- No publications are expected.

Teaching

- Evidence of ability to deliver tutorials and practicals.
- Potential to deliver a sequence of lectures covering one or several topics occupying a substantial fraction of a unit.

Professional Development and Service

- Provision of academic advice and counselling to students on a regular basis.

5.2 Lecturer

Research and Scholarship

- Completion, or near completion, of a PhD or equivalent experience.
- At least one refereed publication is expected each year.
- Evidence of ability to supervise research students.

Teaching

- Preparation and delivery of a sequence of lectures covering one or several topics occupying a substantial fraction of an undergraduate unit.
- Preparation, planning and administration of the tutorials or practicals for an undergraduate unit.

Professional Development and Service

Should include such activities as:

- Teaching of industry relevant material within the courses in which they are involved.
- Provision of academic advice and counselling to students on a regular basis.
- Administration of an undergraduate unit involving, for example, collation and processing of examination results, allocation of students to practicals and tutorials, producing unit materials for issue to students.
- Acting as a reviewer for a scientific conference.

5.3 Senior Lecturer

Research and Scholarship

- An established research record evidenced by conference participation and production of refereed papers and/or technical reports.
- Becoming a known expert in his or her fields as signalled by international correspondence or requests to referee papers.
- At least two refereed publications are expected each year, with at least one at an international level.
- Supervision of research students.

Teaching

- Ability to teach the first and second year undergraduate units and higher-level units related to the individual's area of expertise.
- Initiatives taken to develop existing units and the introduction of new or radically modified units when appropriate.
- Good quality teaching as evidenced by student evaluations or other indicators of excellence in teaching.

Professional Development and Service

Achievements in a range or substantial achievements in at least one of the following activities:

- Involvement in several consultative programs with government agencies, research organisations or private industry.
- Initiatives taken to develop programs involving industrial experience for undergraduate students and joint postgraduate course work and research activities with external groups. On occasions this may include short periods of industrial secondment.
- Working effectively in a supporting role in the administration of at least one significant activity within the Discipline.
- An active member of at least one professional association.
- Working effectively on a continuing University Committee, or having been involved in a special purpose planning or advisory committee.
- Participation on program committees for international conferences.

5.4 Associate Professor

Research and Scholarship

- An established research record evidenced by conference participation and production of refereed papers and/or technical reports.
- At least three refereed publications are expected each year, with at least one at an international level.
- Recognition as a known expert in the individual's field, as signalled by international correspondence, invitations to specialist meetings, requests to speak at other institutions or to referee papers, or keenness of visitors to work with the individual.
- Evidence of a leadership role in developing research activity within the Discipline.
- Successful supervision of research students.

Teaching

- An effective communicator at all levels, together with successful supervision of honours theses.
- Evidence of a leadership role in developing or modifying a section of the Discipline curriculum, possibly at institutions other than Macquarie.
- Significant teaching achievements as documented by the teaching performance indicators.

Professional Development and Service

Major achievements in at least two of the following activities:

- Taking responsibility for a major activity in Discipline affairs.
- Exercising a leadership role in relationships with the University at large, industry and the community.
- Management of international/national scientific conferences (as a program or general chair). Membership on editorial boards and regular invitations to act as a reviewer of grants and research theses.
- A key participant in a collaborative program with a government agency, research organisation or private industry.

5.5 Professor

Research and Scholarship

- A leading expert in his or her areas of research as demonstrated by publications, invitations to conferences as a keynote speaker, and international visitors.
- At least four refereed publications are expected each year with at least two at international level.
- Establishing and fostering areas of excellence within the Discipline.
- Established record in PhD supervision.

Teaching

- Provision of leadership in the development, delivery, management and quality control of a substantial academic program.

Professional Development and Service

Major achievements in at least two of the following activities:

- Exercising a leadership role in relationship with the University at large, research organisations, industry and the community. This may include serving as Head of Department or Division.
- Playing an active role in one or more professional societies in Computing, such as holding office or serving on committees and society editorial boards.
- Effective representation and promotion of the Department, the Division and the University at the national level and possibly at the international level.
- A key participant in a major collaborative program with a government agency, research organisation or private industry; such a program would typically occupy a small team for several years.
- A leadership role in the Discipline.