



DEPARTMENT OF BIOLOGICAL SCIENCES

DISCIPLINE PROFILE – JUNE 2006

OVERVIEW

Nature of Discipline

Unlike the more traditional Departments, Schools or Faculties conducting teaching and research in biology in Australian Universities, the Macquarie University Department of Biological Sciences does not recognise individual sub-disciplines of biology. While we do not, at present, cover the entire spectrum of biology, all the major areas of organismal biology are represented. Some aspects of molecular biology and biochemistry are represented in our 'sister' Department of Chemistry and Biomolecular Sciences. A consequence of our broad coverage is the need to allow for some differences in the experience and research output of staff active in different fields of biology. However, the expectations that the Department has of its entire academic staff are excellence in teaching, a very high level of research performance and commitment to service to the profession and the community.

Evidence of high research achievement or potential is required from all staff, both at the time of appointment, and during tenure in the Department. These qualities are judged by the highest international standards accepted for the discipline.

Teaching Contribution

The normal undergraduate teaching method in the units offered by the Department comprises lectures, tutorials, practical exercises and, in some cases, fieldwork. One staff member acts as unit coordinator and frequently is the only or principal lecturer in the unit. Increasingly, units that integrate knowledge across two or more traditional disciplines are team-taught. Because of the degree of specialisation required, unit coordinators usually change only when there is a major alteration to the unit, or of the Departmental curriculum.

Tutorials are led by the unit lecturers and by junior teachers involved in demonstration in practical classes. Considerable emphasis is placed in most units on the teaching of practical skills. Other teaching avenues are computer-based demonstrations, tutorials, seminars, revisions and assignments.

An important teaching role for members of the staff lies in the training of postgraduate degree candidates and in high-level training at the postdoctoral level. The Department usually has 10 - 20 Honours candidates per annum, and over 80 MPhil and PhD candidates. Except for the Honours course, all higher degrees have been awarded for research achievement. However, Masters by coursework are being developed, commencing, in 2002, with a

coursework Masters Degree in Conservation Biology. The research MPhil program is often preceded by a coursework postgraduate certificate. Research programs are closely supervised by the members of staff directly, usually with one primary supervisor and one or more co-supervisors.

Research and Scholarship

All academic staff are expected to be active researchers. Research performance is evaluated by the publication of results in good quality, refereed scientific journals, the ability of staff to attract competitive research funding, and supervision of postgraduate students.. Well-established and productive biologists should publish an average of 1 - 3 high quality papers per year. A valuable measure of this quality is the number of times the article is cited, but this becomes available only some years after publication. The length of the paper is largely irrelevant. It is rare in biology to see papers written by a single author. Some researchers elect to place first on the author listing, the names of junior collaborators who contributed most to the practical aspects of the research, with the team leader placed last.

For staff members researching in particular areas, research output may be in the form of scholarly works including specialist books, or publication of major reports for national or international agencies. Other research output includes review articles and conference proceedings. The former reflect the level of recognition of the high research standing of the writer. Authorship of invited chapters in books can be regarded on a par with major review articles. In contrast, publications in un-refereed conference proceedings are evidence of research activity, but are not regarded as highly as refereed journal articles. Invitations to deliver plenary talks at scientific conferences indicate recognition as an authority, a very active researcher, or both.

There is a reasonable correlation between research performance and the ability of the researcher to attract funding. In the case of large Government and similar competitive grants, this correlation holds true for the best researchers. However, with limited federal funding, some good or even excellent researchers may be unable to attract financial support every year. Other external funding from specialised bodies or from industry is also normally only available to good researchers.

Contributions to the University and the Community

Staff are expected to share in the administration of the Department by service on committees and by undertaking special duties. In addition, many members of the Department serve for periods of time on Divisional Committees, University bodies such as the Senate, the Council and on numerous University committees. These duties do not normally carry any privileges, such as relief from teaching.

Staff members are expected to act at all times as ambassadors of the Department, of the Division and of the University. This often involves visits to schools and local societies, lectures at other institutions, assistance with visitors, involvement in Open Days and other public relations activities. Other professional duties include involvement in professional societies, assistance in the organising of conferences, service on editorial boards of scientific journals, etc. Sooner or later every staff member becomes involved in the refereeing of

journal articles, grant applications, and in the provision of expert advice to the media, to individuals, and sometimes to the judiciary.

EXPECTATIONS

Qualifications

Level A

Currently staff are very rarely appointed at this level.

Essential qualifications are:

- a good degree in some area of biology or a closely related discipline
- possession of, or eligibility to enrol for, a PhD.

Level B

Essential qualifications are:

- a PhD from a recognised University
- evidence of a high level of research quality and productivity

Desirable qualifications include:

- at least 2 years of postdoctoral experience
- study and research in at least 2 institutions
- teaching experience at a tertiary institution.

Level C

Essential qualifications are:

As for Level B, plus

- evidence of actual or potential teaching excellence at tertiary level
- ability to conduct independent research
- ability to attract competitive research funding
- ability to supervise research students.

Desirable qualifications include:

- involvement in professional activities outside teaching and research
- evidence of administrative capacity
- 8-10 years of postdoctoral research experience in University, industry, or other institutions.

Level D

Essential qualifications are:

As for Level C, plus

- international recognition of research excellence

Desirable qualifications include:

- 15 or more years of postdoctoral research experience
- completed supervision of several PhD candidates
- evidence of involvement in professional activities at a high level
- ability to lead a successful research group
- extensive teaching experience in biology

- active involvement in University and Department administration.

Level E

Essential qualifications are:

- international recognition as a leader in an area of biological research and scholarship.

Desirable qualifications include:

- background of leadership in teaching, research and outreach activities of the Department and University.
- active involvement in the administration of the Department, Division and University at the highest levels.

Teaching

Level A

As stated above, appointments are rarely made at this level. However, teaching normally consists of tutoring and demonstrations in practical classes in close collaboration with lecturers in charge of units. This sometimes involves supervision and organisation of the work of junior demonstrators. Level A lecturers may also be asked to deliver some lectures and to be involved in the examinations and other forms of assessment. Teaching contact hours may vary with student demand and staff availability; typical current load is about 350 hours per annum., but this is reduced for lecturers enrolled in PhD programs. The lecturers are expected to solicit student and senior staff evaluation of their teaching performance.

Lecturers with PhD qualifications may undertake a limited amount of postgraduate supervision, normally together with senior associate supervision. They may also supervise Honours candidates.

Level B

Lecturers at this level are expected to have the main responsibility for convening a unit in the Department. A great deal of freedom is allowed in the mode of delivery of the content. The most common methods involve lectures, tutorials and practicals, with increasing use of on-line delivery. Most biology units are also offered in the external, or distance-education, mode. This requires the digital recording of lectures, either 'live' or in studios, preparation of extensive lecture notes and PowerPoint graphics, teaching at (frequently weekend) on-campus sessions and maintaining discussion boards on unit web pages. Practical teaching involves the supervision of any additional demonstrators and of the technical staff assigned to the unit.

The contents of the unit convened by the lecturer are decided by the perceived needs of the Department and its students, and the expertise and preference of the teacher. They are periodically reviewed and revised. Because of the degree of specialisation required, unit co-ordinators usually change only when there is a major alteration to the unit content or the Departmental curriculum.

In addition to taking primary responsibility for her/his unit/s, each lecturer is expected to fulfil additional teaching duties in collaboration with colleagues.

All lecturers are required to obtain evaluation of their teaching performance by students, through the Centre for Professional Development, and from other staff, in order to continually improve it. Level B lecturers are also expected to participate in the Honours program and to supervise postgraduate degree candidates.

Level C

In addition to normal teaching duties, level C lecturers take a broad view of the needs of their particular teaching area, provide evaluation of the effectiveness of the teaching and advise on how it should be improved. This information is incorporated into the regular review and upgrading of the whole of the Department's curriculum. Teaching loads of level C lecturers are similar to their level B colleagues.

Level D

A high level of overview, evaluation and leadership in the teaching in the Department is expected of level D staff. However, their undergraduate teaching commitments are similar to level C and B lecturers.

Level E

In practice, the amount of teaching by level E staff is not defined as rigidly as for more junior levels. It is common for them to lead large research groups, which normally include a number of candidates for postgraduate degrees. It is expected that Level E staff will still make a contribution to undergraduate teaching, usually in convening and lecturing an advanced-level unit, but the extent of their involvement in practical and tutorial classes may be reduced because of their higher administrative workload.

Scholarship and Research

Level A and B

Lecturers are expected to devote all of their time free of teaching and administrative duties to research. The amount of time available varies, since many lecturers have substantial teaching loads. However, the best advice for advancement in an academic career is that investment of time in research is the optimum route to success. Depending on the experience of the lecturer and their research field, their research may be collaborative or individual. Collaborative research may be with other members of the Department, or University, or with external scientists. Independence is encouraged. Lecturers are strongly advised to devise and develop their own research projects and to apply for funding to the appropriate bodies. Few level A, and many level B lecturers, are likely to immediately succeed in obtaining large grants from the ARC or the NH&MRC, but they are encouraged to try as soon as they have a plausible project. Normal funding sources are from within the University or through collaborative research with well-funded colleagues. Their research is evaluated by success in attracting independent funding and by the number and quality of refereed articles published. The

Department encourages attendance at conferences and the establishment of research networks. However, its ability to assist financially in this is limited.

One to three publications per year would be the most common output (and expected of a level B lecturer). Conference proceedings provide additional evidence of research activity, but they should not be treated as a substitute for publications. Other activity contributing to research evaluation is involvement in professional societies, with responsibilities increasing with the experience of the researcher.

A level B lecturer should have a clearly defined area of research and a project or projects supported by outside funds. The research project can be independent or collaborative. Supervision of one or more research degree candidates is normal.

An important contributor to the research performance of a lecturer is the supervision of research projects of postgraduate student. At this level, such supervision tends to be very direct, with daily contact common. Annual, or sometimes more frequent, evaluation of the progress of the candidates is standard in the Department.

Level C

Senior Lecturers should be acquiring international recognition for their research. This is judged by the feedback on published work, invitations to write book chapters and review articles and to give lectures at specialist conferences. The level of research funding at this stage is normally adequate to support postgraduate students and research assistance. It should be increasingly derived from external competitive funding sources, or from collaborative research with industry and other bodies. It is common for the rate of publication of refereed articles to be 2-4 per year. Most, if not all of these, will have multiple authors, with the lecturer as senior author in about half of them. Regular attendance and presentation at overseas and domestic conferences is normal at this level.

Level D

Although this varies fairly widely, many level D staff supervise research groups made up of postdoctoral fellows, research degree candidates, and research assistants. Their research output can be expected to be 2-6 refereed articles per year, with an occasional book chapter or review. Steady funding support is normal, but its level varies widely because some very good researchers miss out on grants from the ARC, NH&MRC and other major funding agencies. The level of international recognition, mainly in the form of invitation to conferences, should be high, with several invitations per year.

Level E

Most staff at this level lead large mixed research groups. They frequently oversee several projects, differing in detail, but with a common theme. A level E should be a world leader in an area of biological research. This recognition normally attracts generous funding, sometimes in the form of Directorship of a Research Centre. Their productivity varies widely, but 4 refereed publications per year would be regarded as below average.

Service to the University and Community

Level A

University service is largely confined to the Department. Level A lecturers are commonly involved in student advising and various aspects of the administration of teaching units. They are encouraged to take an active part in Department meetings and to join selected committees.

Level B

Membership of Department committees is common. Some level B lecturers become members of Divisional or University committees, but the extent of such involvement is carefully monitored, as it may have a negative impact on their long-term career development. Lecturers are often very active in student advising and assistance. They also play an increasing role in the activities of the appropriate professional societies, often in support administrative and organisational roles. Lecturers with appropriate background act as advisers to community groups.

Level C

All level C lecturers either convene or are members of Department committees. Some are also members of various University Committees and act as Department representatives. They are frequently asked to perform special tasks, such as convening of working groups or acting as advisers to the Head of Department. Many level C lecturers are recognised experts in their area of biology and are active as professional advisers. This involves the refereeing of scholarly articles, grant applications, job applications, research theses, etc. Often such duties involve attendance at meetings of committees and other groups outside the University. Other professional activities can include assistance or major responsibility in the organisation of specialist workshops and conferences, frequently overseas. Many special interest groups, often not academic, seek help and specialised assistance from level C lecturers. This sometimes involves appearance on television or radio programs or interviews with the press.

Level D

The Department expects level D staff to provide administrative help and advice to the Department, to the Division and to the University at the highest level. This ranges from the office of Head of Department, through cluster representation on Divisional or University committees, to major responsibility for the administration of the Department's affairs. Professional activities often consist of the editing or board membership of scientific journals and senior roles in professional societies.

Level E

The extent to which level E staff provide service to the Department, Division or University varies widely. Their time may be predominantly committed to research. Conversely, many Level E staff serve as Head of Department, where their time is heavily committed to policy development and administration. In either circumstance, they are required to advise on Department matters and contribute to the shaping of its overall policy and goals. Level E staff

often enjoy a high profile and are in demand by the media, by professional societies, by the Government and by special interest groups. The extent to which they contribute in this way depends mainly on their individual priorities and commitments.

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