

Division of Information and Communications Sciences

Discipline Profile – Mathematics

August 2004

Overview of the Mathematics Discipline

Mathematics is one of the oldest areas of intellectual pursuit, and provides the very language for understanding the universe and the society in which we live. In addition to its role in extending human knowledge and in answering the fundamental questions which arise in the course of its study for its own sake, the study of mathematics provides

- tools for calculation and computation which are applicable to many areas in science, engineering and finance;
- a context within which to develop a wide range of problem solving and communication skills; as well as
- a framework for rigorous argument and deduction.

The Department of Mathematics at Macquarie University has great strengths, including

- a coherent group of highly motivated and well qualified staff;
- groupings of mathematicians working in analysis, category theory and number theory;
- a new direction of research in waves and non-linear dynamics;
- several researchers of very high academic profile;
- high quality of and innovative approaches to teaching, with many good and some exceptional teachers; and
- an Advanced Mathematics Program for good mathematics students.

The teaching program at undergraduate level includes many units at 100- and 200-level which serve a wide range of students who need to learn mathematics applicable to their areas of interest, as well as a full program of units at all levels for students who wish to major in mathematics. This program is further enhanced by

- the Advanced Mathematics Program which offers undergraduate units in areas and topics which are not usually treated at undergraduate level, with the specific aim of introducing selected undergraduate students to areas of mathematics which are close to areas of ongoing research; and
- an Honours Program for selected students to cover some areas of mathematics in far greater depth.

Research in mathematics at Macquarie University is well respected nationally and internationally, and attracts a substantial amount of external research funding and a steady stream of international visitors who collaborate with members of the Department, making it an ideal environment for postgraduate and postdoctoral research.

The Department of Mathematics is an integral part of the Division and the University, and encourages its members to serve both the Division and the University where opportunities arise.

Expectations for Teaching, Scholarship, Research and Service

The following expectations should be read as a whole. Members of the Department are not expected to be equally involved in each activity mentioned and, indeed, may not have the opportunity to do so. However, it is expected that each member will balance less activity in some area by greater activity in other areas.

Qualifications

Level A	Level B	Level C	Level D	Level E
Master's degree by research, or PhD or equivalent, in mathematics	PhD or equivalent in mathematics, together with an outstanding research record and documented evidence of teaching experience in mathematics			

Teaching

Teaching within the Department of Mathematics is organised in such a way that for almost every unit, at least two members of staff share the lecturing duties and the responsibility. In 100- and 200-level units, the lecturers will be assisted by other colleagues in matters such as tutorials, practical sessions, marking of assignments as well as the evaluation and marking of examinations. In 300-level units, the lecturers are usually expected to undertake the setting and marking of assignments and examinations with less help.

It is expected that staff at all levels will be capable of giving the lectures of any of the undergraduate units offered by the Department. Responsibility for lecturing in any particular unit is very seldom held by the same staff member for more than three years at a time.

A typical teaching load consists of six to seven hours per week of contact time, usually made up of four hours of formal lectures in two different units, and two to three hours of tutorials or practical sessions. Staff members sharing the lecturing of a unit are expected to share the administrative tasks associated with that unit.

The table below outlines the teaching duties normally expected of a member of the Department of Mathematics.

Level A	Level B	Level C	Level D	Level E
Conduct of undergraduate tutorials				
Preparation and delivery of some undergraduate lectures	Preparation and delivery of undergraduate, honours and postgraduate lectures			
Marking of assignments, tests and examinations	Setting and marking of assignments, tests and examinations			
Coordination of units				
Providing ample opportunities for undergraduate students to consult on academic matters				
Preparation of material for the provision of academic advice to undergraduate students				
Participation in the design and periodic review of units				
		Review of the setting of examinations to ensure appropriate length and standard		
			Provision of leadership in the development of the academic program	
Supervision of honours and postgraduate students				
Supervision of vacation scholars				

Scholarship and Research

The table below outlines the research duties and recognition normally expected of a member of the Department of Mathematics. Joint papers with two or three authors are common, and should be viewed with the same weight as papers with single authors.

Level A	Level B	Level C	Level D	Level E
Regular attendance at mathematics colloquia and specialist local seminars				
Emerging reputation in own research field	International reputation in own research field	International reputation as expert in own research field	International reputation as leader in own research field	
Publication in refereed journals or proceedings	Publication in refereed journals or proceedings: at least one article every 2 or 3 years	Publication in refereed journals or proceedings: at least one article every 2 years	Publication in refereed journals or proceedings: at least one article every year	
			Significant contribution to own research field	Seminal contribution to own research field
			Invited keynote presentations at international conferences and workshops	
			Examination of PhD theses	
		Refereeing of journal papers		
		Reviews for Zentralblatt and/or Mathematical Reviews		
				Membership of editorial boards of journals
		International collaboration of research: visits and visitors		
			Organization of international conferences and workshops	Organization of major international conferences and workshops
		Internal or external funding or support	Regular internal and/or external funding or support	
			Research leadership within Department, including mentoring of junior colleagues	

Consultancies and contract research may be pursued, provided that these are arranged through official channels and approved by the Deputy Vice Chancellor (Research).

Service to the University and the Community

The table below outlines some of the activities that members of the Department of Mathematics are encouraged to pursue. Members of staff are not expected to pursue all of these activities, but are expected to contribute significantly in some area.

Level A	Level B	Level C	Level D	Level E
Membership of one or more mathematical societies				Active role in one or more mathematical societies
Promotion of the University and its courses to prospective students				
Contribution to administration within the Department and/or the Division				
Representation of the Department on Division and University committees		Representation of the Department on Division and University committees at a senior level		
Representation of the Division on University committees		Representation of the Division on University committees at a senior level		
Service on University promotion and appointments committees				
			Representation of the University in areas relevant to mathematics	Representation of the University in areas relevant to the Division at policy making levels
			Service as Head of Department	
Contribution to mathematics newsgroups and problem pages				
Contribution to school mathematics and the NSW HSC				

ENDORSED: Ray Offen
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