

**ANU College of Health & Medicine**  
**ANU College of Science**

**Master Advanced Programs – Thesis Handbook**

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## 1. Introduction

The research project in CHM/COS Master Advanced programs are 24-48 units depending on the discipline. The project aims to build on the knowledge and skills that you have learned in the coursework component of the program and the combined coursework and research provide a pathway to PhD study either in Australia or internationally. However, undertaking the research project is much more than this. It is a time of social, professional and intellectual development in which students become better acquainted with some of the central features of academic life: seminars, workshops, presentation of work to colleagues, research design and communication of scientific findings. It is expected that during their research project, Master Advanced students will be embedded in the academic group in which they work.

Students are generally given much more autonomy and responsibility for their own intellectual development during this program. All Master Advanced programs at ANU are based on the model of developing your skills, under supervision, as an independent researcher and innovative thinker. The research project/thesis course will also test your organisational skills; in particular, your ability to prepare, define, plan, carry out and report on research. As a Master Advanced student in science, you will undertake your own empirical research on a topic you choose to study and your research should involve the creation of 'new' information and knowledge in your chosen field. You will prepare a thesis that presents the background for, and describes and explains, your research findings.

Therefore, these programs offer the opportunity to develop a level of learning and a suite of skills that add significant value to those gained during a purely coursework degree. Consistent with this, the learning outcomes for the thesis component describe the knowledge and skills to:

1. Plan and engage in an independent and sustained critical investigation of a chosen research topic to generate new knowledge.
2. Systematically evaluate relevant theory and concepts, relate these to appropriate methodologies and evidence and draw appropriate conclusions.
3. Analyse and interpret original research data with statistical or other evaluative processes where appropriate.
4. Demonstrate sufficient mastery to understand and apply relevant experimental, theoretical or techniques and methods to collect original research data.
5. Communicate and justify complex concepts and results clearly and effectively to a variety of audiences.

## 2. Application and Enrolment Information

2.1. Application eligibility and information can be found on the Programs and Courses entry for each Master Advanced program:

### 2.2 Finding a supervisor

Different programs vary on when you must obtain the agreement of a supervisor. This information is outlined in the Program and Courses entry specific to the program you are interested in. However, it is advised (and considered essential in some areas) that you prepare for the particular topic you choose to study. You may consult the Masters Convener and potential supervisors about the suitability of your courses and your research interests as you proceed towards the thesis course. When talking about your research interests with potential supervisors, you may wish to discuss:

- Their research interests and research plans for the coming year;
- Your own interests and ideas;
- Their preferred supervisory style (How often do they like to meet? Exactly how independent do they expect a student to be? Do they already have a specific project in mind?);

- What they expect of a research student.

If there is a hurdle requirement between the coursework and research components of your program (i.e you must obtain a minimum average mark in your coursework and the agreement of a supervisor to continue to the research component) you will be advised of the outcome as soon as possible. However this will not be before outstanding examination results are available.

### **3. General Guidelines**

#### **3.1 Student Information**

An information document is made available by Schools to Master Advanced students entering the research component that outlines aspects of undertaking research in that discipline. This might include information on entry requirements, admission procedures, the role of the convener, student rights, details of research training components, availability of equipment and support, work, health and safety requirements and details of program assessment and due dates.

#### **3.2 Procedure**

3.2.1 A postgraduate coursework convener is responsible for the co-ordination of the Master Advanced program, there may also be a convener specifically responsible for the research/thesis component: this is often the discipline honours convener.

3.2.2 Students should be advised of their right to approach the conveners where difficulties arise, for instance, regarding supervision.

3.2.3 In accordance with the Rules of the University, a Chair of Examiners and at least one other examiner will be appointed by the Head of the School for each calendar year.

#### **3.3 Program Duration**

3.3.1 The precise duration of the full-time research project/thesis component is set by the convener. Where the research project/ thesis is aligned with that of the undergraduate honours year in the discipline the same duration should apply. For the program to provide a pathway to a PhD at ANU the research project must be at least 24 units and there must be the equivalent of at least 12 units research training in the program. The research training can be integrated with the thesis or identified in separate courses. Specified requirements should be strictly observed.

3.3.2 Extension of time to submit beyond two weeks after the nominated completion date will be subject to the approval of the Deputy Dean Science Education and should be granted only when there are factors clearly beyond the control of a student.

3.3.3 Suspension of Master's candidature during the research project/thesis component will be subject to the approval of the Deputy Dean education.

#### **3.4 Supervision**

3.4.1 The supervisor must be available for the entire period of the research project except for periods of less than two weeks. Any exception, where the supervisor will be unavailable for longer periods, must be reported to the convener. The convener may discuss with the student as well as the supervisor, and will determine whether appointment of a suitably experienced co-supervisor is required, taking into account the specific situation.

3.4.2 For inexperienced supervisors or those new to the ANU, a mentor / co-supervisor arrangement is required to ensure support and guidance is provided to the supervisor and student.

3.4.3 Subject to approval by the convener, thesis supervision may be provided by a person outside the School provided that this supervisor is substantially involved in the Masters program and is responsible to the Head of the School for the supervision of the student. In such cases there must be a co-supervisor who meets the requirements of Clause 36 of the Coursework Awards Rule 2016.

### **3.5 Part-time Candidature**

Part-time candidature during the research project/thesis component is subject to the approval of the Delegated Authority (College Sub-Dean) on the recommendation of the convener; confirmation will be required that the workload and the time allocated to complete the work are comparable to the requirements for full-time students.

### **3.6 Expectations of Students and Supervisors**

A Masters project/thesis is about training as an independent researcher and you will experience some of the independence and self-direction required of higher degree research students, but you also have close contact and direction from your supervisor(s).

All students have a supervisor (in some areas, it may be possible for a student to be jointly supervised by two people). The relationship between supervisor and student involves obligations for both parties. Your supervisor will assist you with advice, guidance and feedback, and help you to achieve your personal academic goals. The supervisor is there to help you choose and design the research project, guide the research in a practical and productive way, and advise you on writing the best thesis of which you are capable. At the same time, your supervisor can only guide your efforts, and then only if you are receptive to advice. You must take the responsibility for the final results of your work.

We expect that you will:

- Maintain a close dialogue and constructive working relationship with your supervisor(s);
- Plan your research program and budget with your supervisor(s);
- Consider advice seriously. If advice is not taken, the supervisor should be informed and given the reasons for the decision;
- Consult regularly with your supervisor. Students should prepare in advance for consultations, by determining the help they require and the areas in which advice would be useful;
- Interact with other students and staff in accordance with collegiate behaviour and the relevant University policies;
- Contribute to the academic life of the School and discipline by attending all relevant seminars;
- Treat School and University facilities and resources with respect and care, and follow Work Health and Safety requirements;
- Observe the relevant University, College and School rules and regulations;
- Complete the formal requirements for the research course;
- Complete, to the best of your ability, a well written, thorough and competent thesis of the highest standard.

Early in the year you need to establish an understanding of your skills and ability to carry out your research. Your supervisor is crucial in this process. In the early series of meetings with your supervisor you need to establish:

- An appreciation of your skills and competency for the project you propose to study (e.g. IT literacy and fluency, data analysis, your oral and written communication skills);

- Your work schedule and meeting times, including any times of absence from campus for you and supervisors;
- Resources and technical support available to you for the project;
- How to gain clearance of your research with ethics committees (if required);
- 'Terms of engagement'. Your supervisor(s), even if they already know you, will be developing a deeper understanding of who you are through the relationship that develops in the course of a research project. You will also need to talk about how you will organise your year and arrange a schedule for your research (note that extensions *cannot* be granted for failure to plan in this way).

Throughout the year, your supervisor will expect to see drafts of your work as the project progresses. It is your responsibility to provide work to your supervisor(s) at mutually convenient times so that full consideration can be given in time for submission by the due date. In some Schools, there is a limit on how many times a supervisor can read sections of a student's thesis.

Students who encounter difficulties should first attempt to resolve them with their supervisor. If this does not produce satisfactory results, they should then consult the convener and then, if the matter remains unresolved, the Associate Director Science Education for the School, the Head of School, the Delegated Authority or the Dean of Students.

Your supervisor(s) also has responsibilities. These are to:

- Assist you in selecting and defining the scope of a suitable thesis topic or problem;
- Meet with you at the commencement of your research project to set expectations for your research project;
- Assist you in designing your thesis research and devising a schedule for its execution;
- Guide you in the selection and application of appropriate data collection and analysis procedures and advise on the solution of any difficulties that arise;
- Meet frequently with you to discuss and evaluate each stage of the thesis project.
- Monitor your progress and advise you when progress is unsatisfactory;
- Facilitate progress, including, in consultation with the convener, redefining the scope of the project when relevant.
- Advise on matters of thesis content, organisation and writing, including the timely provision of feedback, written and oral, on drafts or portions of the thesis;
- Assist you in gaining clearance from the ethics committee (see Ethics in Research below) as required.

Supervisors are also required to report any concerns they have about your progress, attendance or well-being to the convener.

## 4. Ethics in Research

At the ANU, two research Ethics Committees oversee research on humans and other animals – the Human Research Ethics Committee and the Animal Experimentation Ethics Committee. All research projects involving humans and other animals must be approved by the relevant ANU Ethics Committee and data gathering cannot begin until approval is given.

Before undertaking research on humans or animals you must be familiar with the policies and guidelines for Responsible Practice of Research as well as the Australian Code for the Responsible Conduct of Research (2007) available from the Office of Research Integrity website <https://researchservices.anu.edu.au/ori/index.php>. Application procedures for ethics approval for work on humans and animals are also available from this site.

Research involving recombinant DNA must also be approved by the Office of the Gene Technology Regulator (OGTR) and the Institutional Biosafety Committee (IBC). Further information and

procedures are available from <https://researchservices.anu.edu.au/ori/rdna/index.php>.

You will need to know quite a bit about your research project before you can fill in an ethics application. However, you should aim to get your ethics application in as early as you can in the year, as approval can take time. All ethics applications must be prepared in consultation with your supervisor and must be approved by your Head of School/Department before being submitted.

For some projects, the supervisor may have already obtained ethics approval. In these cases you must become a co-signatory on the ethics documents and must be aware of the implications of the approved ethics proposal for your research.

Once you have received approval and begin your research, the onus is on you to behave in a way that is consistent with ethical research practice. Included in this is your behaviour towards your fellow researchers (other students and staff) as well as your human or animal participants. Failure to conduct your research in an ethical manner has significant consequences and in serious cases can jeopardise the broader research effort as well as your own.

## **5. Work Health and Safety**

The University will provide a workplace that is, as far as reasonably practicable: safe and healthy for staff, students, and visitors; and without risk to the environment, in compliance with the Occupational Health and Safety (Commonwealth Employment) Act 1991, other relevant legislation, national standards and codes of practice. Staff, students and visitors are required to do all that is reasonably practicable to ensure that their actions or omissions do not create or increase a risk to the health and safety of themselves or others. Safe work procedures must be observed at all times and equipment must be used in accordance with safe work instructions. Any incidents, exposures, hazards or OHS concerns within the workplace must be reported.

Work Health and Safety training is available for students and may be compulsory in some disciplines.

For more information about Work Health and Safety go to:  
<https://services.anu.edu.au/human-resources/health-safety>.

## **6. Intellectual Property**

The ANU does not, in general, claim ownership of the intellectual property (IP) that students generate. However, under some circumstances it will ask individual students to sign an agreement assigning their ownership rights. These circumstances include where:

- The generation of this IP has required substantial use of University resources and/or services beyond that which is ordinarily provided to students; or
- The generation of IP has resulted from the use of pre-existing IP owned by, or existing within, the University; or
- The IP belongs to a body of IP generated by a team including members of staff of which the student is also a member; or
- The IP results from collaboration, either formal or informal, in a research project with staff; or
- The IP has been generated as a result of funding provided by or obtained through the University.

Where a student is involved in research that is likely to lead to the generation of IP, the University will take reasonable steps to protect students' rights to include their research in their thesis and to be able to publish papers and theses. For more information about the University's policy on IP, go

## 7. Thesis Writing Guide

The process of writing your thesis is an exercise in scientific communication. Your thesis must 'tell a story', in that it must have a logical flow from beginning, to middle to the end. The information you present must be logically structured and must give the reader the sense that they are progressing towards a greater understanding of the topic in general, and of your own research in particular. Your thesis must be analytical and critical in nature, not just descriptive. Your thesis must stand as evidence that you are a competent researcher and that you understand your field and identify strengths, weaknesses and gaps in knowledge or explanation or theory. Your study (hypotheses, design and method) must follow logically from your introduction. The questions you are asking in your research and the measures you are using must make sense in the context of what has gone before in the introduction. In general, your report should start out at a broad level, become narrower and focused in the presentation of your research, and then broaden out again by the end of your discussion.

Your thesis will be written according to a word limit that is defined by your School. This limit is a maximum and you must not go above it. Excessive length will be penalised. In some Schools, theses that exceed the word limit are returned to the student for condensing, and late penalties apply.

When you are writing your thesis, it is advisable that you look at theses written by previous students in your area. Most Schools have a library of past theses that you are able to borrow for short periods.

## 8. Data Fabrication & Plagiarism

The falsification or fabrication of results gained during the course of your work is a serious offence and will not be tolerated. It is essential that students maintain a careful written record of experimental procedures and results. The copying or summarising of another person's results or ideas as if they were one's own will not be tolerated. The source of such material must always be cited in the text and bibliographies of your written work.

University rules concerning data falsification and plagiarism are covered by the Academic Misconduct Rules (<https://www.legislation.gov.au/Details/F2015L02025>).

Penalties for such offences may include failure of the course, suspension or termination of a student's course of study.

## 9. Extensions Policy

Extensions to thesis (and assignment) deadlines will only be granted for health reasons or for unforeseen circumstances (i.e. that arose due to factors beyond the student's control). Unforeseen circumstances in this context do not include the project not producing the anticipated result. In addition, to maintain equity in examination processes, extensions are also not available, if you or your supervisor, believe that further work will provide outstanding results. Extensions will not be granted for employment reasons or due to circumstances that should have been anticipated by you, the student.

Extensions to thesis deadlines require careful and complete documentation of the causes and demonstration that the circumstances were beyond the control of the student. Such applications should be discussed with the supervisor, and, following this, with the Convener. The Convener may approve any extension of up to two weeks. Extension of time to

submit beyond two weeks after the completion date will be subject to the approval of the College Deputy Dean Education on the recommendation of the Convener or Associate Director Education.

## 10. Minimum Requirements for Assessment

Assessment schedules that include an oral defence and/or final seminar should be considered to ensure the level of student's independent mastery of the field can be assessed.

- There should be at least two examiners, the examining panel, for every thesis;
- The examining panel must not include a supervisor.
- As well as satisfying the requirements as set out by the university's policy on Conflict of Interest and Commitment, examiners should must not have had a close involvement with the project and must not be from the supervisor's immediate research group.
- At least one examiner should not be a specialist in the topic of the thesis;
- The course outlines and assessment criteria including grading descriptors and deadlines must be available to students by the second week of enrolment;
- Examiners must use the relevant College grade descriptors (or an approved alternative) in providing a mark;
- There must be a clear and objective link between the written descriptors and the grades assigned;
- The examining panel will construct a written report on each thesis;
- Supervisors will provide a report on their view of the student's performance during the research project, and may also be required to discuss the student's performance with the examiners. However the supervisor must not provide a mark that is included in the calculation of the thesis mark.
- The recommendation on a grade by the examiners should be made without the supervisor present.
- If the recommendations of the examiners are divergent (grades differ by more than 10) an additional examiner must be appointed. This can occur before or following the School Examiners Meeting at the discretion of the convener and Associate Director Education.
- Once the examiners recommended mark(s) have been received, the final marks for an overall grade and the components are determined in an examiners meeting to which all examiners and supervisors are invited; The Committee can require a third examiner be appointed before making their decision, however a supervisor has no authority to demand a third examiner is appointed.
- The Chair of the School Examiners Meeting must document the process undertaken for determining the final thesis mark if a significant divergence of views has occurred (for example divergent examiners marks, or when the supervisor disputes that the mark is appropriate). This report is to be retained by the School, and provided to the College if the student appeals their final result.
- Special consideration of individual student circumstances is undertaken and documented according to University policy  
<http://www.anu.edu.au/students/program-administration/assessments-exams/special-assessment-consideration>)
- There should be some feedback to the student on the progress of the thesis by the mid point of their project.

## 11. Classifying Performance

The class of Masters degree (Pass, or With Commendation) is based on the performance in the whole Master's program.



## 12. Grading Criteria

The following criteria are used to assess the quality of theses and to assign grades. The examiners will ask the supervisors to comment on whether the students have demonstrated some of these characteristics; while the judgement on other characteristics will rely purely on the thesis.

### **Pass 50-59:**

The student:

- has demonstrated some knowledge of the relevant background literature, but with serious gaps, and limited understanding;
- applied relevant techniques and carried out research work, but needed considerable assistance and showed limited understanding of the procedures employed;
- presented their results, though in a somewhat muddled and/or incomplete way.

### **Credit 60-69:**

As for "Pass", but in addition the student:

- has demonstrated a reasonable knowledge of the relevant background literature, with only a few gaps, albeit in a somewhat uncritical way;
- demonstrated that they had learned many of the relevant skills (which might include laboratory techniques, computer programming and statistical analysis);
- presented their results in an appropriate format, and communicated them effectively.

### **Distinction 70-79%:**

As for "credit", but in addition the student:

- has demonstrated a thorough knowledge of the relevant background literature, though still with limited critical appreciation;
- demonstrated reasonable technical mastery of all the relevant skills;
- worked hard, efficiently and carefully;
- presented their results and/or data clearly and succinctly.

### **High Distinction 80-89%:**

As for "Distinction", but in addition the student:

- has critically analysed the relevant background literature rather than merely summarising it;
- produced a thesis that demonstrates a clear appreciation of how their work fits in to the larger field of research;
- demonstrated considerable technical mastery of all the relevant skills;
- showed some appreciation of the limitations of the experimental design or techniques used and have outlined future research directions that are feasible;
- put forward their own useful and valid ideas relating to the project;
- further demonstrated the ability to see, and take, the logical next step without excessive 'prodding', the ability to act independently of the supervisor's immediate direction and presence, but the maturity to know when the supervisor's help is necessary;
- demonstrated the persistence and ability to carry on under difficulty;
- picked up new concepts and skills rapidly;
- showed the ability to work effectively in the presence of others.

**High Distinction >90:**

As above, but in addition the student:

- obtained concepts and procedures independently and at least discussed a use for them in the study;
- demonstrated impressive technical mastery of all the relevant skills;
- demonstrated a good understanding not only of the techniques they employed, but other alternative techniques and the reasons for choosing between them;
- have outlined possible future directions which are not merely feasible but which show considerable originality;
- not only put forward useful and valid ideas relating to the project, but also demonstrated the ability to critically evaluate and act upon such ideas.

### **13. Minimum Allocation of Resources**

The ANU College of Health & Medicine (CHM) and the ANU College of Science (COS) are committed to providing a research environment for students that is unparalleled anywhere else in Australia. As part of this commitment, both colleges aim to maintain and improve research resources for students undertaking Masters degrees. This document outlines the responsibilities of schools within the two colleges that are offering research projects and the minimum level of support that is to be provided to students enrolled in the research component of Master Advanced programs.

#### **14.1 Principles**

The acceptance of a Master Advanced student into a school within CHM or COS requires that the school accepts responsibility to provide a level of support sufficient to enable the completion of the student's initially agreed research project and any agreed variation; such support will include adequate supervision, the provision of adequate resources and appropriate research accommodation.

#### **14.2 Responsibilities of Supervisor(s), Conveners and Directors**

Primary responsibility for oversight of a candidate's work rests with the supervisor(s), including advice on the availability of resources needed to complete the thesis on time (e.g. school resources, computing, library, fieldwork).

The convener's functions include informing new students of resources and providing or arranging pastoral support for students enrolled in the program, in particular to assist in the resolution of problems that may arise between students and supervisors.

It is the responsibility of the School Director, through each supervisor, to provide a level of resources sufficient to enable the completion of the student's initially agreed research project and any agreed variation. Information on minimum resource support for research projects should be conveyed to both commencing and continuing students. Different student projects may have different costs even within the same discipline, and the area in which the student is located is responsible for determining and providing sufficient resources.

#### **14.3 Minimum School Resources**

Students specifically enrolled in a program of research and related activities leading to the award of a Master Advanced program in CHM or COS are assured that the sponsoring area undertakes to provide the following minimum resources:

Sufficient laboratory or office space, infrastructural equipment and facilities to complete the program, these items to be available during the research component of the course, in particular:

- Normal University standards of accommodation, including a desk and chair, located in an area which is secure, within reasonable proximity of the host school; and with internal access to toilets and wash room.
- A lockable filing cabinet or locker/drawer.

- Reasonable access to computing and relevant software facilities.
- Reasonable provision for stationery, postage and receipt of mail; access to photocopying facilities; and use of a telephone (the terms of such provision to be clearly defined at the time of induction).

#### **14.4 Committee Review and Student Grievances**

The convener should from time to time review the provision of resources for students enrolled in Master Advanced programs, and recommend the provision of such additional resources as may appear necessary for the particular discipline concerned. When uncertainty arises concerning the meaning of "sufficient" and "reasonable", the Postgraduate Coursework Committee should adjudicate.

When agreement about resources cannot be reached within the School, including after being reviewed by the relevant Director, a request for review may be lodged with the Deputy Dean.