

# Six Years of MRes at Macquarie




Insights from the Faculty of Science and Engineering **Sep 2019**

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## Master of Research :

research training for HDR and professional experiences




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graph LR; A[Bachelor degree] --> B[BPhil / Master of Research]; B --> C[PhD];
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 **MACQUARIE**  
University

## AQF 8 & 9 levels for delivering BPhil/MRes

The AQF level summaries are statements of the typical achievement of graduates who have been awarded a qualification at a certain level in the AQF.




\* Level 1 – Certificate I  
 \* Level 2 – Certificate II  
 \* Level 3 – Certificate III  
 \* Level 4 – Certificate IV  
 \* Level 5 – Diploma  
 \* Level 6 – Advanced Diploma, Associate Degree  
 \* Level 7 – Bachelor Degree  
 \* Level 8 – Bachelor Honours Degree, Graduate Certificate, Graduate Diploma  
 \* Level 9 – Masters Degree  
 \* Level 10 – Doctoral Degree

### AQF level 9 criteria

<b>Summary</b>	Graduates at this level will have specialised knowledge and skills for research, and/or professional practice and/or further learning
<b>Knowledge</b>	Graduates at this level will have advanced and integrated understanding of a complex body of knowledge in one or more disciplines or areas of practice
<b>Skills</b>	Graduates at this level will have expert, specialised cognitive and technical skills in a body of knowledge or practice to independently: <ul style="list-style-type: none"> <li>• analyse critically, reflect on and synthesise complex information, problems, concepts and theories</li> <li>• research and apply established theories to a body of knowledge or practice</li> <li>• interpret and transmit knowledge, skills and ideas to specialist and non-specialist audiences</li> </ul>

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## Our student intake:

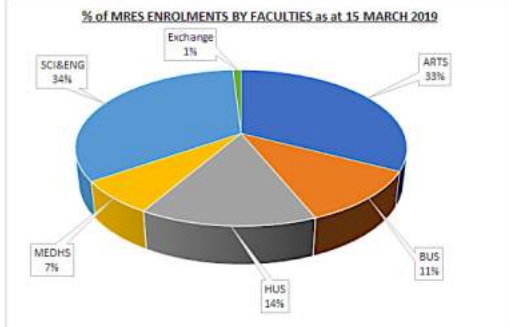
### Year 1 (BPhil) (~60-80 p.a.)

- Requires Bachelor's degree with high attainment (essentially Cr/D average)
- Majority are Macquarie domestic students wishing to supplement U/G coursework with advanced study AND research, i.e. perceive **3+2 yr program**
- Prior degree in relevant discipline, i.e. not suitable for retraining into a new discipline

### MRes Year 2 (~140 p.a.)

- Direct entry possible for Masters or Hons students (with Distinction equiv)

**% of MRES ENROLMENTS BY FACULTIES as at 15 MARCH 2019**



Faculty	Percentage
SCI&ENG	34%
ARTS	33%
HUS	14%
BUS	11%
MEDHS	7%
Exchange	1%

Domain A can be seen to define

## BPhil/MRes Year 1 (FSE)

### Program Learning Outcomes

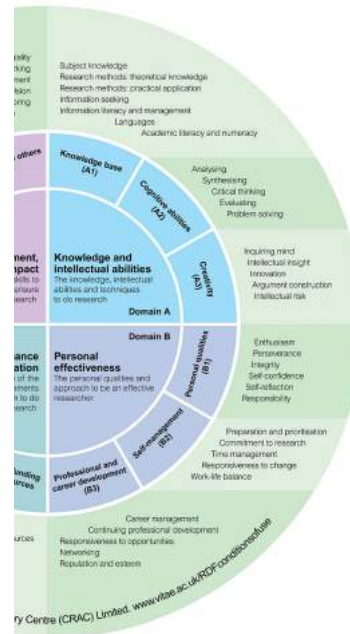
Aims to provide the knowledge, intellectual ability and techniques required for scientific research

**PROVIDES THE Knowledge Base (A1)**

- Subject knowledge
- Research methods theory AND practice
- Information literacy and management
- Information seeking

**ENGAGES Cognitive Abilities (A2):**

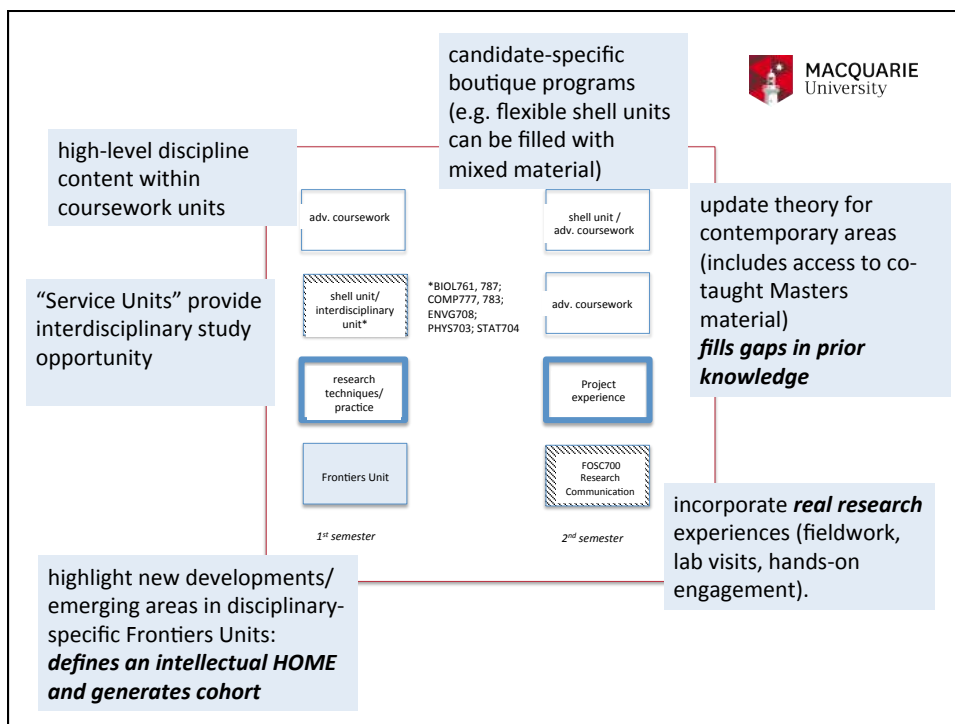
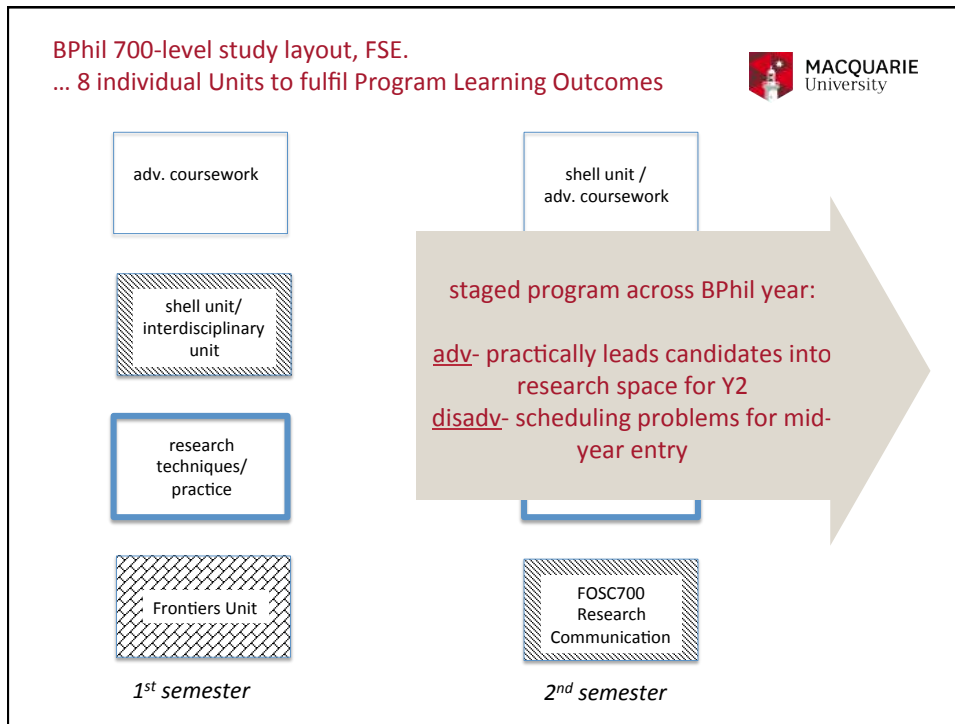
- Analysing
- Synthesising
- Critical thinking
- Evaluating
- Problem solving



### What these students expect:



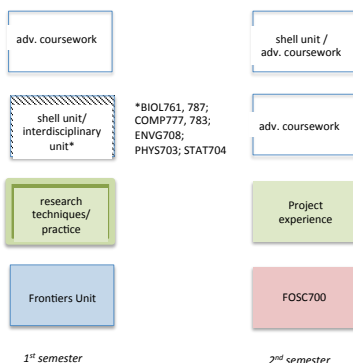
...engagement with research from Day 1



## Distributed curriculum delivery develops research integration

### Research Skills and Practice

- skills for data collection & analysis
- Best taught in small group settings in Dept
- **Inclusion of ECR teachers, so building awareness & integration with research teams/ Centres**



- ### Core S2 unit: Research Communications
- Incl. outreach activity
  - encompasses written & verbal communication
  - **taught across Faculty**

## 8 distinct Y1 programs run across Faculty: some more defined than others

### YEAR 1 Molecular Sciences

Program Structure: Year 1 Units (8 units required)	
MRES700	Research Communications Unit (compulsory)
CBMS700	Research Frontiers Unit
CBMS780	The Research Experience
Advanced Disciplinary Units (choose FIVE units)	
CBMS701	Selected Topics in Molecular Sciences 1
CBMS703	Selected Topics in Molecular Sciences 2
CBMS785	Research Topic: Laboratory Skills for Molecular Science Research
CBMS791	Research Topic: Adv. Organic Chem
CBMS792	Research Topic: Chemical Biology
CBMS793	Research Topic: Advanced Biomolecular Analysis
CBMS794	Research Topic: Synthetic Biology
CBMS797	Research Topic: Advanced Physical and Analytical Chemistry
CBMS731	Molecular and Medical Biotechnology (ncow CBMS331/880)
CBMS732	Protein Discovery & Analysis (ncow CBMS332/832)
CBMS733	Functional Proteomics (ncow CBMS333/833)
CBMS760	Analytical Measurement Uncertainty and Method Validation (ncow CBMS860)
CBMS761	Laboratory Quality Systems (ncow CBMS861)

shells

cotaught with 8xx units

### Biological Sciences

Program Structure: Year 1 Units (8 units required)	
MRES700	Research Communications Unit (compulsory)
BIOL700	Research Frontiers Unit (compulsory)
Advanced Disciplinary Units (choose six units)	
BIOL711	Topics in Evolution
BIOL760	Biology in the 21st Century
BIOL799	Advanced topics in Biology
BIOL761	Conservation of Australian Wildlife
BIOL766	Advanced Studies in Palaeobiology
BIOL773	Marine Conservation & Management
BIOL787	Biodiversity Conservation
BIOL701	Research Topic in Biology 1

Note: Students have the flexibility to undertake units across all disciplines in the University, subject to academic approval.

## What our students say...



- *The shell unit allowed me to focus on skills specifically valuable for my Year 2 MRes project.*
- *The lit review and methods tasks were really valuable in getting a headstart on writing, .... skills and methodology used in this area.*
- *[Most useful features].. “Lab placements, literature review units (especially to get a head start on the thesis but also become more familiar with writing a lit review), workshops, going to the Wednesday seminars”.*

### MRes Year 2



Research  
Frontiers



Explore the latest developments across chosen discipline (10%- internal mark)

+

3 Research Training  
Activities



Project management, writing and research skills development

+

Major Research  
Project



Full year research project  
50 pg thesis (90% - 2 external markers)  
Working closely with supervisor  
Opportunity to progress to PhD

Activity #1: Research Frontiers 2 (worth 10%)	Candidates will be able to develop an individual research project in the context of latest research developments in their field	
	A substantial written report (3,000–4000 words)	<i>attend seminars, contribute to journal clubs, submit annotated review or poster</i>
Activity #2: literature review	A structured review of relevant issues, debates and methodology. Candidates will identify gaps in the literature which their research project seeks to redress	
	A draft literature review / survey, submitted to supervisor for comment	<i>prepare literature review as thesis chapter</i>
Activity #3: research methods	Candidates will learn about the latest research methods in their field/ become fully equipped to make strategic decisions about how to approach their individual research problem	
	Understanding of research methodology in comparison to possible alternatives, capability in appropriate research techniques	<i>attend technical training, document as written protocol(s) or laboratory reports</i>
Activity #4: research planning	Candidates will develop a major research plan, for a project of up to four years scope. A pilot project will be completed during the MRes year, as a preliminary stage	
	Submit written plan for Major Project: research question, methodology, budget, ethics (if nec.), timeline, chapter breakdown	<i>deliver seminar and submit written plan</i>
Activity #5: thesis (worth 90%) DUE:Oct 10	Candidates will complete a research project in order to demonstrate individual research capability	
	Candidates will complete a thesis (50pp) subject to disciplinary standards	



## MRes Y2 structure in FSE

Activities are coordinated in each Dept by MRes Advisor

In other Faculties, some material is centrally taught

## Early Feedback - 2015 MRes students



### Year 1:

Named highlights: flexible course content, research training units, "getting my hands into research"

*Disappointed by lack of advanced content, or practical research experience.*

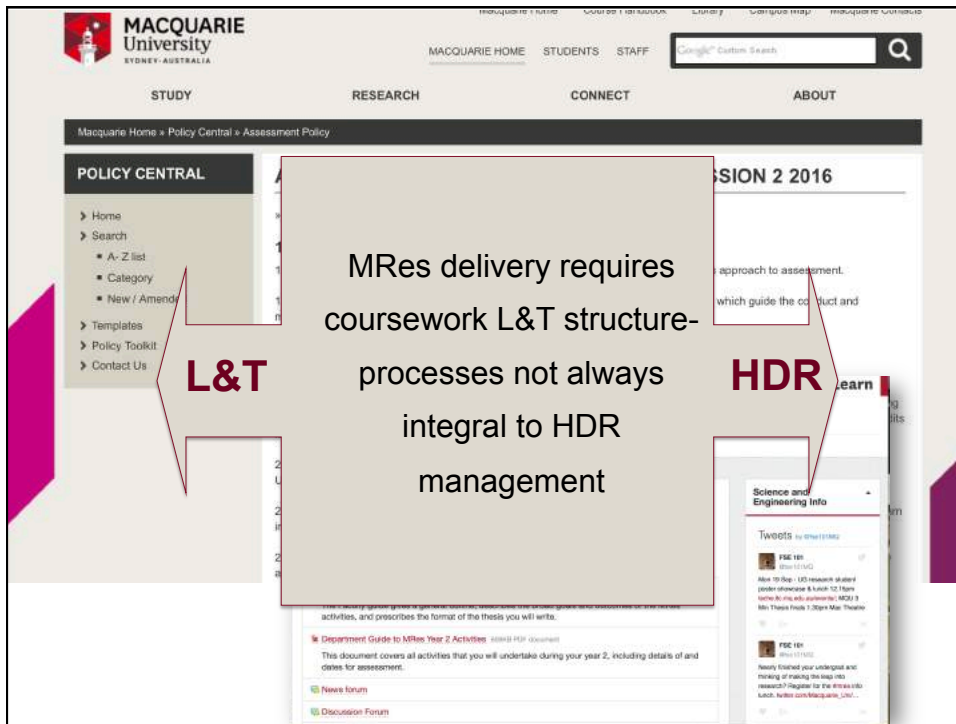
*Enjoyed opportunity to participate in research projects, or build practical field skills and/or research*

*Really useful for giving me time to think over my topic for Y2 and to pilot these ideas in flexible shell units.*

### Year 2:

More clear explanation needed in Departments about structure of component Activities (Lit review, Research Methods, etc), and how they articulate with thesis outputs.

Candidates wish to be more integrated into the Dept community.





<p style="text-align: center;"><b>YEAR 2: two intakes</b>  <b>Jan (Oct thesis)</b>  <b>Jul (April thesis)</b></p> <p style="text-align: center;">HIGHLY STRUCTURED          timeline</p> <p style="text-align: center;">Dept Advisors assist          candidates &amp; supervisors with          time management</p> <p style="text-align: center;">This requires engagement by          Dept HDR/MRes panels,</p> <p style="text-align: center;">not only research supervisors          (who mentor research          aspects)</p>	<p><b>External partnerships &amp; employability :</b></p> <p>MRes Y2 candidates are mentored into existing research networks via supervisors.</p> <p>In 2018, 29% thesis submissions included partnered research:</p> <ul style="list-style-type: none"> <li>• Commercial entities &amp; charities</li> <li>• Local &amp; NSW Govt – Botanical Gardens, DPI, RPA hospital, etc</li> <li>• Interstate engagement- museums, societies, universities</li> <li>• National Facilities - CSIRO, DST, ANSTO</li> <li>• International – incl. European Southern Observatory</li> </ul>
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**Scholarship impact:**

**BPhil**

- **DOMESTIC STUDENTS \$4000 PER SEMESTER**

**MResYr 2**

- **COMPETITIVE AWARD OF STIPEND ~ \$26000 (APA RATE)**






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## What our PhD students say...

What aspects of the MRes program (as a whole) have you found most useful in your PhD?

*"I think I have used, or will use, almost everything that I learnt in the MRes."*

*"It acted as an extra year of the PhD, allowing all kinks to be sorted out earlier and everything to be planned fully. It also meant that I was sure the PhD and lab group were right for me"*

*"I am grateful that I did it vs my friends that haven't -- I believe my project and my confidence in my research is much more developed than those who don't get peer feedback until they start to (or attempt to start to) publish their work"*

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## Introducing our MRes panel:



**A/Prof Tracy Rushmer Assoc. Dean (HDR) FSE**

**Dr Morten Andersen- MRes Supervisor (Mol Sci)**

**Ms Sayantani Chatterjee – former MRes Y2 candidate (Mol Sci)**

**Mr Jean-Antoine Gazi – former BPhil/MResY2 candidate (Earth Sci)**

