

Honours Year

School of Mathematics and Statistics, October 2024



Why Honours?

- Exposure to advanced coursework and research:
 - Preparation for postgraduate study,
 - Certification of excellence in Mathematics & Statistics,
 - A taste of cutting-edge research, a glimpse of the edge of knowledge.
- Develop valuable skills coveted by employers:
 - Research skills,
 - Technical writing and oral presentation skills,
 - Focus, perseverance, and creativity.

Admission requirements

To enter Honours in Mathematics or Statistics, students must have either:

- Completed a Mathematics or Statistics major in the [Science and/or Advanced Science program](#), including at least **30 units of credit in Level III Mathematics**; or
- Completed [Stage 3 of one of the plans](#) in the Advanced Mathematics, or the Physical Oceanography plan in the Advanced Science program; or
- Completed a [suitable](#) Mathematics or Statistics degree at [another university](#).

To enter Honours in Quantitative Data Science you must have either:

- Completed the [Bachelor of Data Science and Decision program](#) (any stream) but [including at least 18 units of credit in Level III MATH or DATA courses](#); or
- Completed a [suitable](#) quantitatively based data science bachelor's degree at UNSW or any [other university](#).

Admission requirements

Average above 70% in **Level III MATH courses** (usually 30 UOC)

and

Average above 70% in **Core Level III MATH courses** (18 UOC).

- **Pure Mathematics:**

- MATH3611 Higher Analysis
- MATH3701 Higher Differential Geometry and Topology
- MATH3711 Higher Algebra

- **Statistics (courses from statistics major):**

- MATH3801/3901 Probability and Stochastic Processes
- MATH 3811/3911 Statistical Inference
- MATH 3821 Statistical Modeling and Computing

- **Applied Mathematics:**

If MATHA plan in 2024 and after, 3 applied courses including:

- MATH3041 Mathematical Modelling for Real World Systems
- And / or MATH3051 Applied Real and Functional Analysis
- Any other Core B courses in Applied (list here: <https://www.unsw.edu.au/science/our-schools/maths/student-life-resources/undergraduate/programs-and-courses/plans-in-advanced-mathematics-and-advanced-science#appliedmathematics>)

Admission requirements (QDS)

Average above 70% in **Level III MATH and DATA courses** (usually 30 UOC)

and

Average above 70% in **Core Level III MATH and DATA courses**

- **Quantitative Data Science :**

- Students must have completed the Bachelor in Data Science and Decision program **including at least 18UOC in level III MATH or DATA course.**

or

- Completed a **bachelor degree which includes at least three level III, or higher level, courses in mathematics or statistics, and at least two level III, or higher level, courses in computer science and/or business** that are listed as electives in program 3959.

Admission Process

Two types of enrolling students:

- Category A: Internal UNSW applicants in three-year undergraduate programs; all external applicants
- Category B: Internal UNSW students in “embedded” programs (honours is a compulsory part of the program). *Note that there are no Cat B Honours in QDS.

How to enrol?

- Everyone must complete the “Intention to Undertake Honours” form (before the 31st of October for international students (A) / 9th of January for domestic (A) and embedded (B) students):

<https://www.science.unsw.edu.au/study-us/undergraduate/honours-degrees/honours-how-apply> (“Apply Now”),
or using the link on the school webpage (*“Intention to Undertake Honours form”*).

- People in category A must also submit a formal application for the program 4500 Science (Honours):

<https://www.science.unsw.edu.au/study-us/undergraduate/honours-degrees/honours-how-apply> (“Apply Online”
for 4500 in Category A section).

Honours Scholarships

Some scholarships are available for honours.

Scholarships that require an application can be found on the UNSW scholarships website:

<https://www.scholarships.unsw.edu.au/>

Some merit scholarships will be awarded to the qualifying students without the need to submit an application.

The Honours Year

- **The Honours year...**
 - the final year of the *Advanced Science/Advanced Mathematics* degree
 - *or* an additional year at the end of your non-Honours Bachelor degree
- You enrol in a thesis subject each term plus **5 approved** (by your Honours coordinator) **courses over the year**
 - **Coursework:** 30 Units of Credit (5 courses at 6 Units of Credit each)
 - **Project/Thesis:** 18 Units of Credit
- There is also a weekly honours seminar.

Honours Year Courses 2025

<https://www.unsw.edu.au/science/our-schools/maths/student-life-resources/postgraduate-coursework/postgraduate-courses>

Course code	Description	Term 1	Term 2	Term 3	Course code	Description	Term 1	Term 2	Term 3
DATA5002	Data Visualisation			DATA5002	MATH5706	Modern Algebra	MATH5706		
DATA9001	Fundamentals of Data Science ***		DATA9001		MATH5715	Harmonic Analysis			MATH5715
MATH5165	Optimization	MATH5165			MATH5735	Modules & Represent'n Theory	MATH5735		
MATH5171**	Linear and Discrete Optimization Modelling			MATH5171	MATH5805	Special Topics in Statistics	MATH5805		
MATH5175	Special Topics (Applied Maths) A: Calculus of Variations		MATH5175		MATH5806	Applied Regression Analysis		MATH5806	
MATH5185	Special Topics (Applied Maths) B:			MATH5185	MATH5816	Continuous Time Fin'l Model'g			MATH5816
MATH5191**	Optimization for Data Science			MATH5191	MATH5825	Measure Integ & Probability			MATH5825
MATH5201	Dynamical Systems and Chaos			MATH5201	MATH5835	Advanced Stochastic Processes	MATH5835		
MATH5215	Special Topics (Applied Maths) C: TBA			MATH5215	MATH5836	Data and Machine Learning		MATH5836	MATH5836
MATH5231****	Prediction and Inverse Modelling	MATH5231			MATH5845	Time Series		MATH5845	
MATH5285	Fluids Oceans and Climate			MATH5285	MATH5846*	Intro to Probability and Stoch Processes	MATH5846		MATH5846
MATH5295	Special Topics (Applied Maths) D: Fractional Calculus		MATH5295		MATH5852	Experimental Design and Causal Inference			MATH5852
MATH5305	Computational Maths for Science & Engineering		MATH5305		MATH5855	Multivariate Analysis			MATH5855
MATH5335	Computational Maths for Finance		MATH5335		MATH5856*	Intro to Statistics and Statistical Computing		MATH5856	
MATH5361	Stochastic Differential Equations: Theory Applications and Numerical Methods			MATH5361	MATH5868	Bootstrap			MATH5868
MATH5371	Numerical Linear Algebra	MATH5371			MATH5885	Longitudinal Data Analysis		MATH5885	
MATH5425	Graph Theory	MATH5425			MATH5901	Stochastic Processes	MATH5901		
MATH5525	Special Topics (Pure Maths) B: Category Theory			MATH5525	MATH5905	Statistical Inference	MATH5905		MATH5905
MATH5605	Functional Analysis		MATH5605		MATH5945	Categorical Data Analysis			MATH5945
MATH5645	Number Theory		MATH5645		MATH5960	Bayesian Inference & Comput'n			MATH5960
MATH5700	Modern Diff Geom and Topology			MATH5700	MATH5965	Discrete Time Fin'l Modelling	MATH5965		
MATH5705	Modern Analysis		MATH5705		MATH5975	Intro to Stochastic Analysis	MATH5975		
					MATH5995	Special Topics in Financial Mathematics - Topic TBA		MATH5995	MATH5995
					MATH6781	Biomathematics		MATH6781	

Honours Year Courses

You **can not enrol yourself** in any MATH5XXX courses!

To enrol in the courses please use the honours course selection form on our website:

<https://forms.unsw.edu.au/form/honours-course-selection>

You should discuss the courses you wish to take with your honours coordinator (send an email with your selection), some may require coordinator approval.

AMSI summer school




AMSI summer school courses can be used in place of
6 UOC of coursework: ss.amsi.org.au



AMSI Summer School 2025
Four-week national training and networking event
hosted by the University of Sydney from 6-31 January

AMSI 25
SUMMER
SCHOOL
IN THE MATHEMATICAL
SCIENCES

<https://www.unsw.edu.au/science/our-schools/maths/student-life-resources/honours-year/amsi-summer-school-course-approval>

SUBJECT
Algebraic Knot Theory
Elliptic PDE from an elementary viewpoint Sponsored by 
Introduction to Financial Calculus
Numerical Solution of Partial Differential Equations with Applications in Industry Sponsored by 
Optimal transportation and Monge-Ampère equations
Statistical and Time Series Analysis of Climate Variables
Statistical modelling and analysis for time-series data in Engineering and Statistics Sponsored by 
Topics in Data Science and Machine Learning

*** Program and grant applications close on Oct 27

Honours Year Project

- Independent study under the supervision of a member of staff over three terms
 - ✓ Thesis (90%)
 - ✓ Oral presentation (10%)
- Potential honours projects and supervisors are on the Honours webpage, but **you are responsible** for finding a supervisor and project.
- Talk to as many people as you can, as early as you can before choosing. This must be organized **before** you apply and start your Honours year!
- Your thesis will describe your project work and place your work in context with current research; any original project work is a bonus!

Projects available in 2025

List of available projects:

<https://www.unsw.edu.au/science/our-schools/maths/student-life-resources/honours-year/honours-applied-mathematics>

<https://www.unsw.edu.au/science/our-schools/maths/student-life-resources/honours-year/honours-pure-mathematics>

<https://www.unsw.edu.au/science/our-schools/maths/student-life-resources/honours-year/statistics>

<https://www.unsw.edu.au/science/our-schools/maths/student-life-resources/honours-year/honours-data-science>

Next steps...

Consult with the relevant Honours Coordinator to discuss your subjects

- **Pure:** Lee Zhao (l.zhao@unsw.edu.au)
 - **Applied and Physical Oceanography:** Amandine Schaeffer (a.schaeffer@unsw.edu.au)
 - **Statistics:** Gery Geenens (ggeenens@unsw.edu.au)
 - **QDS:** Rohithash Chandra (rohithash.chandra@unsw.edu.au)
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- Remember to fill out the intention to undertake form (before the 31st of October for international students (A) / 9th of January for domestic (A) and embedded (B) students).
 - You should also talk to potential supervisors **as soon as possible!**

Get familiar with “The Honours Year” section on the School website

<https://www.unsw.edu.au/science/our-schools/maths/student-life-resources/honours-year>

Questions?

Email your Honours director:

a.schaeffer@unsw.edu.au

or coordinators (previous page).