THE UNIVERSITY of ADELAIDE

2022 Study Plan – Semester 1 Start

Bachelor of Mathematical and Computer Sciences

Contents

Bachelor of Mathematical and Computer Sciences
Program Notes

Level I Mathematical Sciences Course

- Students must complete either *MATHS 1004 Mathematics for Data Science* or *MATHS 1012 Mathematics IB*, but may not present both towards their degree.
- To enrol in *MATHS 1012 Mathematics IB* students must first pass *MATHS 1011 Mathematics IA*, this is presented as a level I elective. Entry into *MATHS 1011 Mathematics IA* requires *SACE Stage 2 Specialist Mathematics*, or a pass in *MATHS 1013 Mathematics IM*.
- Students starting in semester 2 that choose to study *MATHS 1012 Mathematics IB,* will need to take either *MATHS 1011* or *MATHS 1013* in their first semester of study, and take *MATHS 1012* in a later semester.
- Students that wish to continue to study a major in Applied Mathematics, Mathematical Sciences, Pure Mathematics or Statistics will need to complete *MATHS 1012 Mathematics IB*.

Electives

- Electives must include:
    - **Students must complete least 36 units of Mathematical and Computer Sciences courses** of which at least 12 units are at Level III. *MATHS 3025 Professional Practice III* is not considered a Mathematical Sciences course. *ENG 1002 Programming (Matlab and C)* is considered a Computer Science course.
    - **Broadening Electives** to the value of **9 units** that are not from the following subject areas: COMP SCI, MATHS, PURE MTH, APP MATH, STATS. *ENG 1002* does not count towards the Broadening electives requirement.
- Electives may be any University of Adelaide Undergraduate course for which the student meets the pre-requisites. Please check the availability, restriction and incompatible section on the course planner for elective choices.
- How to choose an elective course in your area of interest? Please refer to the steps via the link: https://ecms.adelaide.edu.au/study-with-us/student-support/enrolment

Majors

- Mathematical Sciences majors to the value of 24 units may be taken in one of the following:
    - Applied Mathematics
    - Data and Decision Science
    - Mathematical Sciences
    - Pure Mathematics
    - Statistics
- Mathematical Sciences double majors to the value of 24 units may be taken in one of the following:
    - Applied Mathematics and Pure Mathematics
    - Applied Mathematics and Statistics
    - Pure Mathematics and Applied Mathematics
    - Pure Mathematics and Statistics
    - Statistics and Applied Mathematics
    - Statistics and Pure Mathematics
- MATHS 3021 Capstone Project in Mathematical Sciences III may be presented towards a double major in the discipline of the project.
- Computer Science majors to the value of 24 units may be taken in one of the following:
    - Artificial Intelligence
    - Computer Science
    - Cybersecurity
    - Data Science
    - Distributed Systems and Networking

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Program Notes (Continued)

Minors

- A minor may be chosen from:
  - Public Health

Courses Not Permitted

The following courses cannot be presented as electives:

- ECON 1008 Data Analytics I
- ECON 1010 Introduction to Mathematical Economics (Advanced) I
- ECON 2503 Intermediate Mathematical Economics II
- ECON 2504 Intermediate Econometrics II

Mathematical and Computer Science Internships

- Internships are available to students and allow students to build and apply skills to a relevant workplace setting.
- Students will need to apply for approved internships on CareerHub, and if successful in gaining an internship will be enrolled by the faculty in either *MATHS 3700 / COMP SCI 3700 ECMS Internship* (3 units) or *MATHS 3710 / COMP SCI 3710 ECMS Internship* (6 units).
- For more information see: https://ecms.adelaide.edu.au/study-with-us/student-support/internships/computer-mathematical-sciences

Links and Further Information

- **Course Planner** Information about University courses, including availability, class times, restrictions and prerequisites.
- **University Calendar** All academic program rules.
- **Contact Ask ECMS:** askecms@adelaide.edu.au • +61 8 8313 4148 • www.ecms.adelaide.edu.au

THE UNIVERSITY of ADELAIDE

2022 Study Plan – Semester 1 Start

Bachelor of Mathematical and Computer Sciences
Study Plan

	Course	Units	Status
Year 1			
S1	ENG 1002 Programming (Matlab and C)	3	
S1	# Level I/II/III Elective	3	
S1	# Level I/II/III Elective	3	
S1	^ Level I/II/III Elective	3	
S2	# Level I/II/III Elective	3	
S2	# Level I/II/III Elective	3	
S2	# Level I/II/III Elective	3	
S2	^ Level I Mathematical Sciences Course	3	
Year 2			
S1	# Level I/II/III Elective	3	
S1	# Level II/III Elective	3	
S1	# Level II/III Elective	3	
S1	# Level II/III Elective	3	
S2	# Level I/II/III Elective	3	
S2	# Level II/III Elective	3	
S2	# Level II/III Elective	3	
S2	# Level II/III Elective	3	
Year 3			
S1	MATHS 3025 Professional Practice III	3	
S1	# Level III Elective	3	
S1	Level III Mathematical And Computer Sciences Elective	3	
S1	Level III Mathematical And Computer Sciences Elective	3	
S2	# Level III Elective	3	
S2	# Level III Elective	3	
S2	Capstone Course	3	
S2	Level III Mathematical And Computer Sciences Elective	3	

Core Course		Elective Course (see Elective Tables)	
CM = Completed	**CR** = Credit Awarded	**EN** = Currently Enrolled	**ENROL** = Add to Enrolments

^ Level I Mathematical Sciences Course: Please refer to Level I Mathematical Sciences Course notes on Program Notes page.

 # Electives:

- **Students must complete least 36 units of Mathematical and Computer Sciences courses** of which at least 12 units are at Level III. *MATHS 3025 Professional Practice III* is not considered a Mathematical Sciences course. *ENG 1002 Programming (Matlab and C)* is considered a Computer Science course.
- **Broadening Electives** to the value of **9 units** that are not from the following subject areas: COMP SCI, MATHS, PURE MTH, APP MATH, STATS. *ENG 1002* does not count towards the Broadening electives requirement.
- Please note that the ordering of electives is an example only, students are free to change the ordering of electives if required.
- For more information refer to the Program Notes page.

Bachelor of Mathematical and Computer Sciences
Elective Tables

Available	Course	Units	Status
Level I Mathematical Sciences Course Table			
S2	MATHS 1004 Mathematics for Data Science I	3	
SS S1 S2	MATHS 1012 Mathematics IB	3	
Capstone Course Table			
S2	COMP SCI 3006 Software Engineering & Project	3	
S2	COMP SCI 3310 Software Engineering & Project (Artificial Intelligence)	3	
S2	COMP SCI 3311 Software Engineering & Project (Data Science)	3	
S2	COMP SCI 3312 Software Engineering & Project (Cybersecurity)	3	
S2	COMP SCI 3313 Software Engineering & Project (Distributed Systems & Networking)	3	
S2	MATHS 3021 Capstone Project in Mathematical Sciences III	3	

Available	Course	Units	Status
Applied Mathematics Elective Table			
S1	APP MTH 3001 Applied Probability III	3	
S1	APP MTH 3002 Fluid Mechanics III	3	
S1	APP MTH 3014 Optimisation III	3	
S1	APP MTH 3021 Modelling with Ordinary Differential Equations III	3	
S2	APP MTH 3016 Random Processes III	3	
S2	APP MTH 3023 Partial Differential Equations and Waves III	3	
S2	APP MTH 3124 Decision Science III	3	
Mathematical Sciences Elective Table			
S1	MATHS 2101 Multivariable & Complex Calculus II	3	
S1	MATHS 2102 Differential Equations II	3	
S1	MATHS 2103 Probability & Statistics II	3	
S1 S2	MATHS 1011 Mathematics IA	3	
S1 S2	MATHS 1013 Mathematics IM	3	
S2	MATHS 2100 Real Analysis II	3	
S2	MATHS 2104 Numerical Methods II	3	
S2	MATHS 3012 Financial Modelling: Tools & Techniques III	3	
S2	MATHS 3021 Capstone Project in Mathematical Sciences III	3	
S2	MATHS 3026 Cryptography III	3	
SS S1 S2	MATHS 1012 Mathematics IB	3	
SS S1 S2	MATHS 3700 ECMS Internship (see Program Notes)	3	
SS S1 S2	MATHS 3710 ECMS Internship (see Program Notes)	6	
Pure Mathematics Elective Table			
S1	PURE MTH 2106 Algebra II	3	
S1	PURE MTH 3002 Topology and Analysis III	3	
S1	PURE MTH 3007 Groups and Rings III	3	
S1	PURE MTH 3019 Complex Analysis III	3	
S2	PURE MTH 3009 Integration and Analysis III	3	
Statistics Elective Table			
S1	STATS 3001 Statistical Modelling III	3	
S1	STATS 3006 Mathematical Statistics III	3	
S1 S2	STATS 1000 Statistical Practice I	3	
S1 S2	STATS 1004 Statistical Practice I (Life Sciences)	3	
S2	STATS 1005 Statistical Analysis and Modelling I	3	
S2	STATS 2107 Statistical Modelling and Inference II	3	
S2	STATS 3022 Data Science III	3	
S2	STATS 3023 Computational Bayesian Statistics III	3	

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Available	Course	Units	Status
Computer Science Elective Table			
Not Available	COMP SCI 3309 Cybersecurity A Practical Application	3	
S1	COMP SCI 1010 Puzzle Based Learning	3	
S1	COMP SCI 2005 Systems Programming	3	
S1	COMP SCI 2207 Web & Database Computing	3	
S1	COMP SCI 3001 Computer Networks & Applications	3	
S1	COMP SCI 3007 Artificial Intelligence	3	
S1	COMP SCI 3305 Parallel and Distributed Computing	3	
S1	COMP SCI 3306 Mining Big Data	3	
S1	COMP SCI 3308 Cybersecurity Fundamentals	3	
S1	COMP SCI 3315 Computer Vision	3	
S1	ELEC ENG 3088 Computer Architecture	3	
S1 S2	COMP SCI 1102 Object Oriented Programming	3	
S1 S2	COMP SCI 2000 Computer Systems	3	
S1 S2	COMP SCI 2103 Algorithm Design & Data Structures	3	
S1 S2	COMP SCI 2201 Algorithm & Data Structure Analysis	3	
S2	COMP SCI 1106 Introduction to Software Engineering	3	
S2	COMP SCI 2203 Problem Solving & Software Development	3	
S2	COMP SCI 3004 Operating Systems	3	
S2	COMP SCI 3006 Software Engineering & Project	3	
S2	COMP SCI 3012 Distributed Systems	3	
S2	COMP SCI 3307 Secure Programming	3	
S2	COMP SCI 3310 Software Engineering & Project (Artificial Intelligence)	3	
S2	COMP SCI 3311 Software Engineering & Project (Data Science)	3	
S2	COMP SCI 3312 Software Engineering & Project (Cybersecurity)	3	
S2	COMP SCI 3313 Software Engineering & Project (Distributed Systems & Networking)	3	
S2	COMP SCI 3314 Introduction to Statistical Machine Learning	3	
S2	COMP SCI 3316 Evolutionary Computation	3	
SS S1 S2	COMP SCI 3700 ECMS Internship (see Program Notes)	3	
SS S1 S2	COMP SCI 3710 ECMS Internship (see Program Notes)	6	

Bachelor of Mathematical and Computer Sciences
Mathematical Sciences Majors

Applied Mathematics Major

Available	Course	Units	Status
	Courses to the value of 12 units from the following:		
S1	APP MTH 3001 Applied Probability III	3	
S1	APP MTH 3002 Fluid Mechanics III	3	
S1	APP MTH 3014 Optimisation III	3	
S1	APP MTH 3021 Modelling with Ordinary Differential Equations III	3	
S2	APP MTH 3016 Random Processes III	3	
S2	APP MTH 3023 Partial Differential Equations and Waves III	3	
S2	APP MTH 3124 Decision Science III	3	
S2	STATS 3023 Computational Bayesian Statistics III	3	
	and Mathematical Sciences courses to the value of 12 units		

Data and Decision Sciences Major

Available	Course	Units	Status
	All of the following courses must be completed:		
N/A	APP MTH 2105 Optimisation and Operations Research II	3	
S1	MATHS 2103 Probability & Statistics II	3	
S1 S2	COMP SCI 2201 Algorithm & Data Structure Analysis	3	
S2	STATS 2107 Statistical Modelling and Inference II	3	
	and courses to the value of 12 units from the following:		
S1	APP MTH 3014 Optimisation III	3	
S1	COMP SCI 3306 Mining Big Data	3	
S1	STATS 3001 Statistical Modelling III	3	
S2	APP MTH 3124 Decision Science III	3	
S2	STATS 3022 Data Science III	3	
S2	STATS 3023 Computational Bayesian Statistics III	3	

Mathematical Sciences Major

Available	Course	Units	Status
	All of the following courses must be completed:		
SS S1 S2	MATHS 1012 Mathematics IB	3	
	and Level III courses to the value of 12 units from Applied Mathematics, Pure Mathematics and Statistics Courses.		
	and Mathematical Science courses to the value of 9 units.		

Pure Mathematics Major

Available	Course	Units	Status
	Courses to the value of 12 units from the following:		
S1	PURE MTH 3002 Topology and Analysis III	3	
S1	PURE MTH 3007 Groups and Rings III	3	
S1	PURE MTH 3019 Complex Analysis III	3	
S2	PURE MTH 3009 Integration and Analysis III	3	
	and Mathematical Sciences courses to the value of 12 units		

Bachelor of Mathematical and Computer Sciences

Statistics Major

Available	Course	Units	Status
	All of the following courses must be completed:		
S1	STATS 3001 Statistical Modelling III	3	
S1	STATS 3006 Mathematical Statistics III	3	
	and courses to the value of 6 units from the following:		
S1	APP MTH 3001 Applied Probability III	3	
S2	APP MTH 3016 Random Processes III	3	
S2	STATS 3022 Data Science III	3	
S2	STATS 3023 Computational Bayesian Statistics III	3	
S2	APP MTH 3124 Decision Science III	3	
	and Mathematical Sciences courses to the value of 12 units		

Bachelor of Mathematical and Computer Sciences
Mathematical Sciences Double Majors

Applied Mathematics and Pure Mathematics Double Major

Available	Course	Units	Status
	Courses to the value of 12 units from the following:		
S1	APP MTH 3001 Applied Probability III	3	
S1	APP MTH 3002 Fluid Mechanics III	3	
S1	APP MTH 3014 Optimisation III	3	
S1	APP MTH 3021 Modelling with Ordinary Differential Equations III	3	
S2	APP MTH 3016 Random Processes III	3	
S2	APP MTH 3023 Partial Differential Equations and Waves III	3	
S2	APP MTH 3124 Decision Science III	3	
S2	STATS 3023 Computational Bayesian Statistics III	3	
	plus courses to the value of 9 units from the following:		
S1	PURE MTH 3002 Topology and Analysis III	3	
S1	PURE MTH 3007 Groups and Rings III	3	
S1	PURE MTH 3019 Complex Analysis III	3	
S2	PURE MTH 3009 Integration and Analysis III	3	
	and Mathematical Sciences courses to the value of 3 units		

Applied Mathematics and Statistics Double Major

Available	Course	Units	Status
	Courses to the value of 12 units from the following:		
S1	APP MTH 3001 Applied Probability III	3	
S1	APP MTH 3002 Fluid Mechanics III	3	
S1	APP MTH 3014 Optimisation III	3	
S1	APP MTH 3021 Modelling with Ordinary Differential Equations III	3	
S2	APP MTH 3016 Random Processes III	3	
S2	APP MTH 3023 Partial Differential Equations and Waves III	3	
S2	APP MTH 3124 Decision Science III	3	
	plus all of the following courses must be completed:		
S1	STATS 3001 Statistical Modelling III	3	
S1	STATS 3006 Mathematical Statistics III	3	
	and courses to the value of 3 units from the following:		
S1	APP MTH 3001 Applied Probability III	3	
S2	APP MTH 3016 Random Processes III	3	
S2	APP MTH 3124 Decision Science III	3	
S2	STATS 3022 Data Science III	3	
S2	STATS 3023 Computational Bayesian Statistics III	3	
	and Mathematical Sciences courses to the value of 3 units		

Pure Mathematics and Applied Mathematics Double Major

Available	Course	Units	Status
	Courses to the value of 12 units from the following:		
S1	PURE MTH 3002 Topology and Analysis III	3	
S1	PURE MTH 3007 Groups and Rings III	3	
S1	PURE MTH 3019 Complex Analysis III	3	
S2	PURE MTH 3009 Integration and Analysis III	3	
	plus courses to the value of 9 units from the following:		
S1	APP MTH 3001 Applied Probability III	3	
S1	APP MTH 3002 Fluid Mechanics III	3	
S1	APP MTH 3014 Optimisation III	3	
S1	APP MTH 3021 Modelling with Ordinary Differential Equations III	3	
S2	APP MTH 3016 Random Processes III	3	
S2	APP MTH 3023 Partial Differential Equations and Waves III	3	
S2	APP MTH 3124 Decision Science III	3	
S2	STATS 3023 Computational Bayesian Statistics III	3	
	and Mathematical Sciences courses to the value of 3 units		

Pure Mathematics and Statistics Double Major

Available	Course	Units	Status
	Courses to the value of 12 units from the following:		
S1	PURE MTH 3002 Topology and Analysis III	3	
S1	PURE MTH 3007 Groups and Rings III	3	
S1	PURE MTH 3019 Complex Analysis III	3	
S2	PURE MTH 3009 Integration and Analysis III	3	
	plus all of the following courses must be completed:		
S1	STATS 3001 Statistical Modelling III	3	
S1	STATS 3006 Mathematical Statistics III	3	
	and courses to the value of 3 units from the following:		
S1	APP MTH 3001 Applied Probability III	3	
S2	APP MTH 3016 Random Processes III	3	
S2	APP MTH 3124 Decision Science III	3	
S2	STATS 3022 Data Science III	3	
S2	STATS 3023 Computational Bayesian Statistics III	3	
	and Mathematical Sciences courses to the value of 3 units		

Statistics and Applied Mathematics Double Major

Available	Course	Units	Status
	All of the following courses must be completed:		
S1	STATS 3001 Statistical Modelling III	3	
S1	STATS 3006 Mathematical Statistics III	3	
	and courses to the value of 6 units from the following:		
S1	APP MTH 3001 Applied Probability III	3	
S2	APP MTH 3016 Random Processes III	3	
S2	STATS 3022 Data Science III	3	
S2	STATS 3023 Computational Bayesian Statistics III	3	
S2	APP MTH 3124 Decision Science III	3	
	plus courses to the value of 9 units from the following:		
S1	APP MTH 3001 Applied Probability III	3	
S1	APP MTH 3002 Fluid Mechanics III	3	
S1	APP MTH 3014 Optimisation III	3	
S1	APP MTH 3021 Modelling with Ordinary Differential Equations III	3	
S2	APP MTH 3016 Random Processes III	3	
S2	APP MTH 3023 Partial Differential Equations and Waves III	3	
S2	APP MTH 3124 Decision Science III	3	
	and Mathematical Sciences courses to the value of 3 units		

Statistics and Pure Mathematics Double Major

Available	Course	Units	Status
	All of the following courses must be completed:		
S1	STATS 3001 Statistical Modelling III	3	
S1	STATS 3006 Mathematical Statistics III	3	
	and courses to the value of 6 units from the following:		
S1	APP MTH 3001 Applied Probability III	3	
S2	APP MTH 3016 Random Processes III	3	
S2	STATS 3022 Data Science III	3	
S2	STATS 3023 Computational Bayesian Statistics III	3	
S2	APP MTH 3124 Decision Science III	3	
	plus courses to the value of 9 units from the following:		
S1	PURE MTH 3002 Topology and Analysis III	3	
S1	PURE MTH 3007 Groups and Rings III	3	
S1	PURE MTH 3019 Complex Analysis III	3	
S2	PURE MTH 3009 Integration and Analysis III	3	
	and Mathematical Sciences courses to the value of 3 units		

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Computer Science Majors

Artificial Intelligence Major

Available	Course	Units	Status
	All of the following courses must be completed:		
S1	COMP SCI 3007 Artificial Intelligence	3	
S2	COMP SCI 3310 Software Engineering & Project (Artificial Intelligence)	3	
	and courses to the value of 6 units from the following:		
S2	COMP SCI 3314 Introduction to Statistical Machine Learning	3	
S1	COMP SCI 3315 Computer Vision	3	
S2	COMP SCI 3316 Evolutionary Computation	3	
	and Computer Science courses to the value of 12 units		

Computer Science Major

Available	Course	Units	Status
	All of the following courses must be completed:		
S1 S2	COMP SCI 2000 Computer Systems	3	
S1 S2	COMP SCI 2201 Algorithm & Data Structure Analysis	3	
	and courses to the value of 3 units from the following:		
S2	COMP SCI 3006 Software Engineering & Project	3	
S2	COMP SCI 3310 Software Engineering & Project (Artificial Intelligence)	3	
S2	COMP SCI 3311 Software Engineering & Project (Data Science)	3	
S2	COMP SCI 3312 Software Engineering & Project (Cybersecurity)	3	
S2	COMP SCI 3313 Software Engineering & Project (Distributed Systems & Networking)	3	
	and Level III Computer Science courses to the value of 9 units		
	and Computer Science courses to the value of 6 units		

Cybersecurity Major

Available	Course	Units	Status
	All of the following courses must be completed:		
S2	COMP SCI 3307 Secure Programming	3	
S1	COMP SCI 3308 Cybersecurity Fundamentals	3	
S2	COMP SCI 3312 Software Engineering & Project (Cybersecurity)	3	
	and courses to the value of 3 units from the following:		
S1	COMP SCI 3001 Computer Networks & Applications	3	
N/A	COMP SCI 3309 Cybersecurity A Practical Application	3	
S2	MATHS 3026 Cryptography III	3	
	and Computer Science courses to the value of 12 units		

Data Science Major

Available	Course	Units	Status
	All of the following courses must be completed:		
S1	COMP SCI 3306 Mining Big Data	3	
S2	COMP SCI 3311 Software Engineering & Project (Data Science)	3	
S2	COMP SCI 3314 Introduction to Statistical Machine Learning	3	
	and courses to the value of 3 units from the following:		
S1	COMP SCI 3305 Parallel and Distributed Computing	3	
S1	STATS 3001 Statistical Modelling III	3	
S1	STATS 3006 Mathematical Statistics III	3	
	and Computer Science courses to the value of 12 units		

Distributed Systems and Networking Major

Available	Course	Units	Status
	All of the following courses must be completed:		
S1	COMP SCI 3001 Computer Networks & Applications	3	
S2	COMP SCI 3012 Distributed Systems	3	
S2	COMP SCI 3313 Software Engineering & Project (Distributed Systems & Networking)	3	
	and courses to the value of 3 units from the following:		
S2	COMP SCI 3004 Operating Systems	3	
S1	COMP SCI 3305 Parallel and Distributed Computing	3	
	and Computer Science courses to the value of 12 units		

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Public Health Minor

Public Health Minor

Available	Course	Units	Status
	All the following courses must be completed:		
S1 S2	PUB HLTH 1001 Health and Illness in Populations	3	
S2	PUB HLTH 2007 Epidemiology for Health and Medical Sciences	3	
	and courses to the value of 3 units may be taken from the following:		
S1	PUB HLTH 3009 Experimental Research Design and Analysis	3	
S1	PUB HLTH 3010 Practical Epidemiology in Health Sciences	3	
	and courses to the value of 6 units may be taken from the following:		
S2	PUB HLTH 1003 Communication for Health Sciences	3	
S2	PUB HLTH 1004 Flies, drains & Ebola: Human health & environment	3	
S2	PUB HLTH 1006 Saving lives or respecting rights? An introduction to health ethics	3	
N/A	PUB HLTH 2008 Rural Australia: Health beyond the burbs	3	
S2	PUB HLTH 2009 Introduction to Counselling Theory and Practice	3	
S1	PUB HLTH 2200 Social Foundations of Health II	3	
N/A	PUB HLTH 3006EX International Public Health Experience 2	3	
WS	PUB HLTH 3007 Nutrition: Ideology, Individuals & Industry	3	
S2	PUB HLTH 3008 Reawakening Health Systems: People, Planning and Policy	3	
S2	PUB HLTH 3011 Big Challenges in Public Health	3	
WS	PUB HLTH 3122 International Health III	3	
S1	PUB HLTH 3124 Health Promotion III	3	