

# Bachelor of Mathematical Sciences (Advanced)

These Program Rules should be read in conjunction with the University's policies (<http://www.adelaide.edu.au/policies>).

## 1 General

There shall be a degree of Bachelor of Mathematical Sciences (Advanced) and an Honours degree of Bachelor of Mathematical Sciences. A candidate may obtain either degree or both.

## 2 Duration of program

The program of study for the Bachelor degree shall extend over three years of full-time study or the equivalent part-time study.

## 3 Assessment and examinations

3.1 A candidate shall not be eligible to attend for examination unless the prescribed work has been completed to the satisfaction of the teaching staff concerned.

3.2 In determining a candidate's final result in a course (or part of a course) the examiners may take into account oral, written, practical and other work, provided that the candidate has been given adequate notice at the commencement of the teaching of the course of the way in which such work will be taken into account and of its relative importance in the final result.

3.3 There shall be four classifications of pass in the final assessment of any course for the Bachelor degree, as follows: Pass with High Distinction, Pass with Distinction, Pass with Credit, Pass.

3.4 A candidate who fails a course for the Bachelor degree and who desires to take that course again shall, unless exempted wholly or partially there from by the Head of the School concerned, again complete the required work in that course to the satisfaction of the teaching staff concerned.

3.5 A candidate who has twice failed any course for the Bachelor degree may not enrol for that course again or for any other course which in the opinion of the Faculty contains a substantial amount of the same material, except by permission of the Faculty and then only under such conditions as the Faculty may prescribe.

## 4 Qualification requirements

### 4.1 General: Bachelor of Mathematical Sciences (Advanced)

4.1.1 To qualify for the Bachelor degree a candidate shall, subject to the conditions and modifications specified under 3.3 above, pass courses from 4.2 below to the value of at least 72 units which satisfy the following requirements:

a A candidate shall pass Level I courses to the value of at least 18 units including:

COMP SCI 1012 Scientific Computing .....	3
MATHS 1008 Mathematics for Information Technology I .....	3
MATHS 1011 Mathematics IA .....	3
MATHS 1012 Mathematics IB .....	3
STATS 1005 Statistical Analysis & Modelling I .....	3

Courses in addition to the above shall be chosen from 4.2.1.2, 4.2.1.3, 4.2.1.4, 4.2.1.5 below.

b A candidate shall pass Level II courses to the value of at least 21 units including:

MATHS 2100 Real Analysis .....	3
MATHS 2101 Multivariable & Complex Calculus .....	3
MATHS 2102 Differential Equations .....	3
MATHS 2103 Probability and Statistics .....	3
MATHS 2xxx Advanced Mathematical Perspectives II .....	3

Courses in addition to the above shall be chosen from 4.2.2.1, 4.2.2.2, 4.2.2.3, 4.2.2.4, 4.2.2.5 below.

c A candidate shall pass Level III courses to the value of at least 24 units including:

i at least 15 units of study chosen from Applied Mathematics, and/or Pure Mathematics, and/or Statistics.....	18
ii MATHS 3105 Communication Skills III .....	3
MATHS 3xxx Advanced Mathematical Perspectives III .....	3

Courses in addition to the above shall be chosen from 4.2.3.1, 4.2.3.3, 4.2.3.4, 4.2.3.5, 4.2.3.6 below. Candidates shall also complete courses for at least one of the majors in defined in 4.1.7.

- 4.1.2 A candidate for the Bachelor of Mathematical Sciences (Advanced) must maintain a GPA of at least 5.0. A candidate that fails to achieve this standard will be required to transfer to the Bachelor of Mathematical Sciences
- 4.1.3 A graduate who wishes to qualify for the degree of Bachelor of Mathematical Sciences (Advanced) and to count towards that degree courses which have already been presented for another degree may do so providing such a candidate presents a range of courses which fulfils the requirements of 4.1.1 above, and includes courses to the value of at least 24 units from 4.2.2.1, 4.2.3.1 and 4.2.3.2 below that have not been presented for any other degree. At least 21 of these 24 units must be at Level III.
- 4.1.4 No candidate will be permitted to count for the degree any course together with any other course which, in the opinion of the Faculty, contains a substantial amount of the same material; and no course may be counted twice towards the degree. No candidate may present the same section of a course in more than one course for the degree.
- 4.1.5 Except with permission of the Faculty, students who have completed at another institution part of the equivalent of the requirements for the Adelaide degree of Bachelor of Mathematical Sciences (Advanced) will be required to complete courses from 4.2.3, to the value of at least 24 units including at least 18 units from 4.2.3.1.
- 4.1.6 With permission of the Faculty a student who has completed most of the courses for the degree of Bachelor of Mathematical Sciences (Advanced) at the University of Adelaide including courses from 4.2.3.1 to the value of at least 9 units may be permitted to complete the requirements for the degree at another institution. All applications must be made in writing to the Faculty.
- 4.1.7 To complete a major in a Mathematical Sciences Discipline, a candidate shall successfully complete:
- Applied Mathematics*  
Level III courses offered in Applied Mathematics to the value of at least 12 units.
- Mathematical Sciences*  
Candidates who do not otherwise qualify for a major in Applied Mathematics, Pure Mathematics or Statistics and who have successfully completed at least 12 units of Level III courses offered across those Disciplines will qualify for the award of a major in Mathematical Sciences.
- Pure Mathematics*  
Level III courses offered in Pure Mathematics to the value of at least 12 units.
- Statistics*  
Level III courses in Statistics to the value of at least 12 units, including STATS 3001 Statistical Modelling III, and STATS 3006 Mathematical Statistics III, and at least 6 units chosen from:  
APP MTH 3001 Applied Probability III\*  
APP MTH 3016 Random Processes III\*  
APP MTH 3030 Stochastic Decision Theory III\*  
STATS 3003 Sampling Theory and Practice III  
STATS 3005 Time Series III  
STATS 3008 Biostatistics III
- \* These courses may be presented towards a major in Statistics or a major in Applied Mathematics but not both.
- 4.1.8 To complete a double major in Mathematical Sciences Disciplines, a candidate shall successfully complete:
- Applied Mathematics and Pure Mathematics*  
Level III courses offered in Applied Mathematics to the value of at least 12 units and Level III courses offered in Pure Mathematics to the value of at least 9 units.
- Applied Mathematics and Statistics*  
Level III courses offered in Applied Mathematics to the value of at least 12 units and Level III courses offered in Statistics to the value of at least 9 units including STATS 3001 Statistical Modelling III and STATS 3006 Mathematical Statistics III.
- Pure Mathematics and Applied Mathematics*  
Level III courses offered in Pure Mathematics to the value of at least 12 units and Level III courses offered in Applied Mathematics to the value of at least 9 units.
- Pure Mathematics and Statistics*  
Level III courses offered in Pure Mathematics to the value of at least 12 units and Level III courses offered in Statistics to the value of at least 9 units including STATS 3001 Statistical Modelling III and STATS 3006 Mathematical Statistics III.
- Statistics and Applied Mathematics*

Level III courses offered in Statistics to the value of at least 12 units including STATS 3001 Statistical Modelling III and STATS 3006 Mathematical Statistics III, and Level III courses offered in Applied Mathematics to the value of at least 9 units.

*Statistics and Pure Mathematics*

Level III courses offered in Statistics to the value of at least 12 units including STATS 3001 Statistical Modelling III and STATS 3006 Mathematical Statistics III, and Level III courses offered in Pure Mathematics to the value of at least 9 units.

4.2 Program of study for the degree of Bachelor of Mathematical Sciences (Advanced)

Notwithstanding the Academic Program Rules published in this volume, a number of the courses listed in the program leading to the degree of Bachelor of Mathematical Sciences (Advanced) may not be offered within a given calendar year.

4.2.1 Level I courses

4.2.1.1 Mathematical Sciences courses

MATHS 1008 Mathematics for Information Technology I .....	3
MATHS 1011 Mathematics IA .....	3
MATHS 1012 Mathematics IB .....	3
STATS 1005 Statistical Analysis and Modelling I .....	3

4.2.1.2 Computer Science courses

COMP SCI 1012 Scientific Computing .....	3
COMP SCI 1003 Internet Computing .....	3
COMP SCI 1101 Introduction to Programming.....	3
COMP SCI 1102 Object Oriented Programming .....	3
COMP SCI 1103 Algorithm Design & Data Structures .....	3

4.2.1.3 Humanities and Social Sciences courses

Level I courses listed for the degree of B.A. and approved by the Faculty Program Adviser.

4.2.1.4 Economics and Commerce courses

Courses listed for the degree of B.Ec. and approved by the Faculty Program Adviser.

4.2.1.5 Science courses

Level I Science courses listed for the degree of B.Sc. in the Faculty of Sciences.

4.2.2 Level II courses

4.2.2.1 Mathematical Sciences courses

*Applied Mathematics*

APP MTH 2105 Optimisation and Operations Research.....	3
MATHS 2104 Numerical Methods .....	3

*Core Mathematics*

MATHS 2100 Real Analysis .....	3
MATHS 2101 Multivariable & Complex Calculus .....	3
MATHS 2102 Differential Equations .....	3
MATHS 2103 Probability and Statistics .....	3
MATHS 2xxx Advanced Mathematical Perspectives II .....	3

*Pure Mathematics*

PURE MTH 2106 Algebra .....	3
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*Statistics*

STATS 2107 Statistical Modelling & Inference .....	3
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4.2.2.2 Computer Science

COMP SCI 2000 Computer Systems .....	3
COMP SCI 2002 Database & Information Systems .....	3
COMP SCI 2005 Systems Programming C and C++ .....	3
COMP SCI 2006 Introduction to Software Engineering .....	3
COMP SCI 2201 Algorithm & Data Structure Analysis .....	3

4.2.2.3 Humanities and Social Sciences courses

Advanced level courses or Level II language courses listed for the degree of B.A. and approved by the Faculty Program Adviser.

4.2.2.4 Economics and Commerce courses

Level II courses listed for the degree of B.Ec. and approved by the Faculty Program Adviser.

4.2.2.5 Science courses

Level II Science courses listed for the degree of B.Sc. in the Faculty of Sciences

4.2.3 Level III courses

4.2.3.1 Mathematical Sciences courses

MATHS 3xxx Advanced Mathematical Perspectives III ..... 3

*Applied Mathematics*

APP MTH 3000 Computational Mathematics III ..... 3

APP MTH 3001 Applied Probability III ..... 3

APP MTH 3002 Fluid Mechanics III ..... 3

APP MTH 3004 Mathematical Biology III ..... 3

APP MTH 3010 Variational Methods & Optimal Control III ..... 3

APP MTH 3012 Financial Modelling: Tools & Techniques III ..... 3

APP MTH 3013 Differential Equations III ..... 3

APP MTH 3014 Optimisation III ..... 3

APP MTH 3016 Random Processes III ..... 3

APP MTH 3017 Waves III ..... 3

APP MTH 3019 Mathematical Modelling in Nanotechnology III ..... 3

APP MTH 3020 Stochastic Decision Theory III ..... 3

*Pure Mathematics*

PURE MTH 3002 Topology and Analysis III ..... 3

PURE MTH 3003 Number Theory III ..... 3

PURE MTH 3007 Groups and Rings III ..... 3

PURE MTH 3009 Integration and Analysis III ..... 3

PURE MTH 3012 Fields and Geometry III ..... 3

PURE MTH 3018 Coding and Cryptology III ..... 3

PURE MTH 3019 Complex Analysis III ..... 3

PURE MTH 3020 Methods of Modern Mathematics III ..... 3

PURE MTH 3021 Logic and Computability ..... 3

PURE MTH 3022 Geometry of Surfaces III ..... 3

PURE MTH 3023 Fields and Modules III ..... 3

PURE MTH 3024 Finite Geometry III ..... 3

*Statistics*

STATS 3001 Statistical Modelling III ..... 3

STATS 3003 Sampling Theory and Practice III ..... 3

STATS 3005 Time Series III ..... 3

STATS 3006 Mathematical Statistics III ..... 3

STATS 3008 Biostatistics III ..... 3

4.2.3.2 Miscellaneous (non Maths & Comp Sc courses)

MATHS 3015 Communication Skills III ..... 3

4.2.3.3 Computer Science

COMP SCI 3001 Computer Networks & Applications ..... 3

COMP SCI 3002 Programming Techniques ..... 3

COMP SCI 3004 Operating Systems ..... 3

COMP SCI 3005 Computer Architecture ..... 3

COMP SCI 3006 Software Engineering & Project ..... 3

COMP SCI 3007 Artificial Intelligence ..... 3

COMP SCI 3009 Advanced Programming Paradigms ..... 3

COMP SCI 3012 Distributed Systems ..... 3

COMP SCI 3013 Event Driven Computing ..... 3

COMP SCI 3014 Computer Graphics ..... 3

4.2.3.4 Humanities and Social Sciences courses

Advanced Level or Level III Language courses listed for the degree of B.A, and approved by the Faculty Program Adviser.

4.2.3.5 Economics and Commerce courses

Level III courses listed for the degree of B.Ec. and approved by the Faculty Program Adviser.

4.2.3.6 Science courses

Level III Science courses listed for the degree of B.Sc. in the Faculty of Sciences.

4.3 Graduation

Subject to Chapter 89 of the Statutes, candidates who have satisfied the requirements for any award of the University shall be admitted to that award.

**5 Special circumstances**

When in the opinion of the relevant Faculty special circumstances exist, the Council, on the recommendation of the Faculty in each case, may vary any of the provisions of the Academic Program Rules for any particular award.