

Master of Data Science (MADS) - MDS

CRICOS code (International applicants): 0101854

	On-campus	Online
Start:	Semester 1 (February) Semester 2 (July) Semester 3 (November)	Semester 1 (February) Semester 2 (July) Semester 3 (November)
Campus:	Toowoomba	-
Fees:	Commonwealth supported place Domestic full fee paying place International full fee paying place	Commonwealth supported place Domestic full fee paying place International full fee paying place
Standard duration:	2 years full-time, 4 years part-time	

Contact us

Future Australian and New Zealand students	Future International students	Current students
Ask a question Freecall (within Australia): 1800 269 500 Phone (from outside Australia): +61 7 4631 5315 Email: study@usq.edu.au	Ask a question Phone: +61 7 4631 5543 Email: international@usq.edu.au	Ask a question Freecall (within Australia): 1800 007 252 Phone (from outside Australia): +61 7 4631 2285 Email: usq.support@usq.edu.au

Program aims

With the popularity of social media and the wide spread use of the Internet, enormous amounts of data of various types are generated at all times. The Master of Data Science is designed to provide an opportunity for graduates from all disciplines to gain advanced skills and knowledge in handling data more commonly known as Big Data, as well as producing and interpreting data analytics. The aim of this program is to provide students with a career path in Data Science and an opportunity for advancement in their career.

Program objectives

On completion of the program students should be able to:

- Autonomously apply key ICT and data science professional knowledge, technologies and programming skills to critically investigate and analyse contemporary core issues in a global market, and to develop big data analysis and evidence-based decision-making skills.
- Select, adapt and apply specialised quantitative and technical skills to work independently and collaboratively to process and interpret major theories and concepts associated with big data to solve and interpret complex and real-life problems.
- Work under broad direction within a team environment, manage conflict, and take a leadership role for a task within the project.
- Apply and communicate ethical, legal, and professional standards related to big data privacy and building of a security culture, and assess and evaluate risks in order to comply with customer organisational requirements.
- Investigate, critically analyse, evaluate and communicate research findings and problem solutions associated with applied data theories and methodologies to specialist and non-specialist audiences.

Australian Qualifications Framework

The Australian Qualifications Framework (AQF) is a single national, comprehensive system of qualifications offered by higher education institutions (including universities), vocational education and training institutions and secondary schools. Each AQF qualification has a set of descriptors which define the type and complexity of knowledge, skills and application of knowledge and skills that a graduate who has been awarded that qualification has attained, and the typical volume of learning associated with that qualification type.

This program is at AQF Qualification Level 09. Graduates at this level will have specialised knowledge and skills for research, and/or professional practice and/or further learning.

The full set of levels criteria and qualification type descriptors can be found by visiting www.aqf.edu.au.

Admission requirements

To be eligible for admission, applicants must satisfy the following requirements:

- Completion of an Australian university three year Bachelor degree in any area, or equivalent OR
- A minimum of five years' professional work experience equivalent to a qualification at AQF Level 7.
- English Language Proficiency requirements for Category 2.

All students are required to satisfy the applicable [English language requirements](#).

If students do not meet the English language requirements they may apply to study a University-approved [English language program](#). On successful completion of the English language program, students may be admitted to an award program.

Program fees

Commonwealth supported place

A Commonwealth supported place is where the Australian Government makes a contribution towards the cost of a students' higher education and students pay a [student contribution amount](#), which varies depending on the courses undertaken. Students are able to calculate the fees for a particular course via the [Course Fee Finder](#).

Commonwealth Supported students may be eligible to defer their fees through a Government loan called [HECS-HELP](#).

Domestic full fee paying place

Domestic full fee paying places are funded entirely through the full fees paid by the student. Full fees vary depending on the courses that are taken. Students are able to calculate the fees for a particular course via the [Course Fee Finder](#).

Domestic full fee paying students may be eligible to defer their fees through a Government loan called [FEE-HELP](#) provided they meet the residency and citizenship requirements.

Australian citizens, Permanent Humanitarian Visa holders, Permanent Resident visa holders and New Zealand citizens who will be resident outside Australia for the duration of their program pay full tuition fees and are not eligible for [FEE-Help](#).

International full fee paying place

International students pay full fees. Full fees vary depending on the courses that are taken and whether they are studied on-campus, via distance education/online. Students are able to calculate the fees for a particular course via the [Course Fee Finder](#).

Program structure

The program consists of 16 units comprising of:

- 12 units of core ICT courses
- 4 units of elective courses (any Postgraduate courses, subject to pre-requisite satisfaction)

Core ICT courses

Courses	Semester of offer Online	Semester of offer Toowoomba campus	Semester of offer Springfield campus
CSC5020 Foundations of Programming	1,2,3	1,2,3	
CIS5310 IS/ICT Project Management	1,2,3	1	1
STA8170 Statistics for Quantitative Researchers	1	1	
CIS8008 Business Intelligence	1,2	1	1
CSC8001 Introduction to Data Science and Visualisation	1,2	1,2	
CSC8002 Big Data Management	2,3	2	2
CSC8003 Machine Learning	2,3	2	
CSC8004 Data Mining	1	1	
STA8005 Multivariate Analysis for High-Dimensional Data	1	1	
CIS8025 Big Data Visualisation	1,2	1,2	
CIS8500 Applied Research for Information System Professionals	1,2	2	1
CSC8600 Advanced ICT Professional Project	1,2	1,2	

Research

Research dissertation courses as electives

Students wishing to pursue a PhD are encouraged to complete the research dissertation courses below as their electives.

Courses	Online	Toowoomba	Springfield
MSC8001 Research Project I^{*#}	1,2	1,2	
MSC8002 Research Project II^{*#}	1,2	1,2	

Footnotes

* Two-unit course

Subject to prior approval by Program Director

Research training courses as electives

Students wishing to pursue a research and development career are encouraged to complete the research training courses below as their elective.

Courses	Online	Toowoomba	Springfield
MSC8003 Industry Based Research Practice I^{*#}	1,2	1,2	
MSC8004 Industry Based Research Practice II^{*#}	1,2	1,2	
OR			
SCI8101 Science in Practice	1,2		
SCI8102 Research Skills	1,2		
SCI8103 Research Fundamentals and Ethics	1,2	1,2	

1 x Elective course			
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Footnotes

- * Two-unit course
- # Subject to prior approval by Program Director

Required time limits

Students have a maximum of six years to complete this program.

Articulation

Students completing the research project track within the Master of Data Science would be eligible to apply for articulation to the [Master of Science \(Research\)](#) or [Doctor of Philosophy](#) programs if they meet other requirements for entry into those programs. Students completing the research training track within the Master of Data Science with the appropriate GPA would be eligible to apply for enrolment in the [Master of Science \(Research\)](#) (Advanced) and then could progress (articulate) to a [Doctor of Philosophy](#) via that route once they have demonstrated satisfactory progress in a significant research component.

Exit points

Students may exit with the [Graduate Diploma of Science](#) (Applied Data Science) on successful completion of at least eight courses within the Master of Data Science if they have satisfied the requirements of a [Graduate Diploma of Science](#) (Applied Data Science). Students may exit with the [Graduate Diploma of Science](#) (General) if they have completed at least eight courses from the Master of Data Science, including four post-graduate courses coded at 5000 level or above.

Students may exit with the [Graduate Certificate of Science](#) (Applied Data Science) on successful completion of at least four courses within the Master of Data Science if they have satisfied the requirements of a [GCSC Graduate Certificate of Science](#) (Applied Data Science). Students may exit with the [Graduate Certificate of Science](#) (General) if they have completed at least four courses from the Master of Data Science, including at least two courses coded at 5000 level or above.

Credit

Exemptions/credit for all specialisations will be assessed according to [USQ procedure](#).

- Up to **four** units of coursework exemptions or credit will be granted if the student has completed courses equivalent to courses offered in the Master of Data Science in either:
 - USQ's [Graduate Certificate of Science](#); or
 - A Graduate Diploma or Bachelor's Honours Degree qualification in a discipline different from the current area of study.
- Up to **eight** units of coursework credit or exemptions will be granted if the student has completed courses equivalent to courses offered in the Master of Data Science in either:
 - USQ's [Graduate Diploma of Science](#); or
 - A Graduate Diploma or Bachelor's Honours Degree qualification in a discipline equivalent to the current area of study.

Notes:

- (1) All requests for credits or exemptions need to be sought by the student and approved by the Program Director.
- (2) The Program Director will deem to what extent prior studies are equivalent.

Enrolment

Recommended Enrolment Pattern - Full-time (4 Semesters, S1 entry)

Students are able to enrol in any offered mode of a course (on-campus, external or online), regardless of the program mode of study they enrolled in.

Students may, with approval of the Program Director and acceptance by an appropriate supervisor, elect to replace two or four units of research training courses ([SCI8101 Science in Practice](#), [SCI8102 Research Skills](#), [SCI8103 Research Fundamentals and Ethics](#) and/or 1 approved course) with one or two 2-unit research project courses ([MSC8001 Research Project I](#) and [MSC8002 Research Project II](#)) or ([MSC8003 Industry Based Research Practice I](#) and [MSC8004 Industry Based Research Practice II](#)).

Course	Year of program and semester in which course is normally studied						Enrolment requirements
	On-campus (ONC)		External (EXT)		Online (ONL)		
	Year	Sem	Year	Sem	Year	Sem	
Year 1 Semester 1							
CSC8001 Introduction to Data Science and Visualisation	1	1,2			1	1,2	
CIS8025 Big Data Visualisation	1	1			1	1	Enrolment is not permitted in CIS8025 if CIS8701 has been previously completed.
STA8170 Statistics for Quantitative Researchers	1	1			1	1,2	Enrolment is not permitted in STA8170 if STA2300 or STA1003 has been previously completed.
CSC5020 Foundations of Programming	1	1,2,3			1	1,2,3	
Year 1 Semester 2							
CIS8008 Business Intelligence **					1	2	
CSC8002 Big Data Management	1	2			1	2	Pre-requisite or Co-requisite: CSC1401 and (STA2300 or STA1003 or STA8170) or equivalent program and statistical knowledge and skills.
CSC8003 Machine Learning	1	2			1	2	Pre-requisite: (STA2300 or STA1003 or STA8170) and CSC1401 or equivalent program and statistical knowledge and skills.
CIS5310 IS/ICT Project Management **					1	2	Enrolment is not permitted in CIS5310 if CIS8010 has been previously completed.
Year 2 Semester 1							
STA8005 Multivariate Analysis for High-Dimensional Data	2	1			2	1	Pre-requisite or Co-requisite: STA8170 or STA2300 or STA1003
CSC8004 Data Mining	2	1			2	1	Pre-requisite: (STA2300 or STA1003 or STA8170) and CSC1401
Either the following two courses for the Research Training Track							
SCI8103 Research Fundamentals and Ethics	2	1			2	1	Pre-requisite: Students must be enrolled in one of the following programs: MSCN or MSCR or MCTN or MADS or GCSC or GDSI or DPHD or its equivalent. Enrolment is not permitted in SCI8103 if SCI4405 has been previously completed.
Elective	2	1			2	1	
or one of the following courses for the Research Project Track (if approved instead of Research Training Track)							
MSC8001 Research Project I *	2	1			2	1	Pre-requisite: Students must be enrolled in one of the following Programs: MCTN or MCOP or MCTE or MSCN or MCCO or MADS

Course	Year of program and semester in which course is normally studied						Enrolment requirements
	On-campus (ONC)		External (EXT)		Online (ONL)		
	Year	Sem	Year	Sem	Year	Sem	
							or have the approval of their program coordinator
or							
MSC8003 Industry Based Research Practice I *	2	1			2	1	Pre-requisite: Students must be enrolled in one of the following programs: MSCN or MADS
Year 2 Semester 2							
CSC8600 Advanced ICT Professional Project	2	2			2	2	Pre-requisite: CIS5310 and Students must have successfully completed 12 units prior to enrolment in this course
CIS8500 Applied Research for Information System Professionals	2	2			2	2	Pre-requisite: CIS8001 or CIS8008
Either the following two courses for the Research Training Track							
SCI8101 Science in Practice					2	1,2	
SCI8102 Research Skills					2	1,2	
or one of the following courses for the Research Project Track (if approved instead of Research Training Track)							
MSC8002 Research Project II *	2	2			2	2	Pre-requisite: MSC8001
or							
MSC8004 Industry Based Research Practice II *	2	2			2	2	Pre-requisite: MSC8003

Footnotes

** This course is offered online only in Semester 2.

* Two unit course

Recommended Enrolment Pattern - Part-time (8 Semesters, S1 entry)

Students are able to enrol in any offered mode of a course (on-campus, external or online), regardless of the program mode of study they enrolled in.

Students may, with approval of the Program Director and acceptance by an appropriate supervisor, elect to replace two or four units of research training courses ([SCI8101 Science in Practice](#), [SCI8102 Research Skills](#), [SCI8103 Research Fundamentals and Ethics](#) and/or 1 approved course) with one or two 2-unit research project courses ([MSC8001 Research Project I](#) and [MSC8002 Research Project II](#)) or ([MSC8003 Industry Based Research Practice I](#) and [MSC8004 Industry Based Research Practice II](#)).

Course	Year of program and semester in which course is normally studied						Enrolment requirements
	On-campus (ONC)		External (EXT)		Online (ONL)		
	Year	Sem	Year	Sem	Year	Sem	
Year 1							
CSC8001 Introduction to Data Science and Visualisation	1	1,2			1	1,2	
STA8170 Statistics for Quantitative Researchers	1	1			1	1,2	Enrolment is not permitted in STA8170 if STA2300 or STA1003 has been previously completed.
CSC5020 Foundations of Programming	1	1,2,3			1	1,2,3	
CSC8002 Big Data Management	1	2			1	2	Pre-requisite or Co-requisite: CSC1401 and (STA2300 or STA1003 or STA8170) or equivalent program and statistical knowledge and skills.

Course	Year of program and semester in which course is normally studied						Enrolment requirements
	On-campus (ONC)		External (EXT)		Online (ONL)		
	Year	Sem	Year	Sem	Year	Sem	
Year 2							
CIS8025 Big Data Visualisation	2	1			2	1	Enrolment is not permitted in CIS8025 if CIS8701 has been previously completed.
CIS8008 Business Intelligence	2	1			2	1,2	
CSC8003 Machine Learning	2	2			2	2	Pre-requisite: (STA2300 or STA1003 or STA8170) and CSC1401 or equivalent program and statistical knowledge and skills.
CIS5310 IS/ICT Project Management **					2	2	Enrolment is not permitted in CIS5310 if CIS8010 has been previously completed.
Year 3							
STA8005 Multivariate Analysis for High-Dimensional Data	3	1			3	1	Pre-requisite or Co-requisite: STA8170 or STA2300 or STA1003
CSC8004 Data Mining	3	1			3	1	Pre-requisite: (STA2300 or STA1003 or STA8170) and CSC1401
CSC8600 Advanced ICT Professional Project	3	2			3	2	Pre-requisite: CIS5310 and Students must have successfully completed 12 units prior to enrolment in this course
CIS8500 Applied Research for Information System Professionals	3	2			3	2	Pre-requisite: CIS8001 or CIS8008
Year 4							
Either the following two courses for the Research Training Track							
SCI8103 Research Fundamentals and Ethics	4	1			4	1	Pre-requisite: Students must be enrolled in one of the following programs: MSCN or MSCR or MCTN or MADS or GCSC or GDSI or DPHD or its equivalent. Enrolment is not permitted in SCI8103 if SCI4405 has been previously completed.
SCI8101 Science in Practice					4	1,2	
or one of the following courses for the Research Project Track (if approved instead of Research Training Track)							
MSC8001 Research Project I *	4	1			4	1	Pre-requisite: Students must be enrolled in one of the following Programs: MCTN or MCOP or MCTE or MSCN or MCCO or MADS or have the approval of their program coordinator
or							
MSC8003 Industry Based Research Practice I *	4	1			4	1	Pre-requisite: Students must be enrolled in one of the following programs: MSCN or MADS
Either the following two courses for the Research Training Track							
SCI8102 Research Skills					4	1,2	
Elective	4	2			4	2	
or one of the following courses for the Research Project Track (if approved instead of Research Training Track)							
MSC8002 Research Project II *	4	2			4	2	Pre-requisite: MSC8001
or							
MSC8004 Industry Based Research Practice II *	4	2			4	2	Pre-requisite: MSC8003

Footnotes

- ** This course is only offered online in S2.
* Two unit course

Recommended Enrolment Pattern - Full-time (4 Semesters, S2 entry)

Students are able to enrol in any offered mode of a course (on-campus, external or online), regardless of the program mode of study they enrolled in.

Students may, with approval of the Program Director and acceptance by an appropriate supervisor, elect to replace two or four units of research training courses ([SCI8101 Science in Practice](#), [SCI8102 Research Skills](#), [SCI8103 Research Fundamentals and Ethics](#) and/or 1 approved course) with one or two 2-unit research project courses ([MSC8001 Research Project I](#) and [MSC8002 Research Project II](#)) or ([MSC8003 Industry Based Research Practice I](#) and [MSC8004 Industry Based Research Practice II](#)).

Course	Year of program and semester in which course is normally studied						Enrolment requirements
	On-campus (ONC)		External (EXT)		Online (ONL)		
	Year	Sem	Year	Sem	Year	Sem	
Year 1 Semester 2							
CSC5020 Foundations of Programming	1	1,2,3			1	1,2,3	
CIS8008 Business Intelligence **					1	2	
CIS5310 IS/ICT Project Management **					1	2	Enrolment is not permitted in CIS5310 if CIS8010 has been previously completed.
CSC8001 Introduction to Data Science and Visualisation	1	1,2			1	1,2	
Year 2 Semester 1							
STA8170 Statistics for Quantitative Researchers	2	1			2	1,2	Enrolment is not permitted in STA8170 if STA2300 or STA1003 has been previously completed.
CIS8025 Big Data Visualisation	2	1			2	1	Enrolment is not permitted in CIS8025 if CIS8701 has been previously completed.
CSC8004 Data Mining	2	1			2	1	Pre-requisite: (STA2300 or STA1003 or STA8170) and CSC1401
CIS8500 Applied Research for Information System Professionals	2	1			2	1	Pre-requisite: CIS8001 or CIS8008
Year 2 Semester 2							
CSC8002 Big Data Management	2	2			2	2	Pre-requisite or Co-requisite: CSC1401 and (STA2300 or STA1003 or STA8170) or equivalent program and statistical knowledge and skills.
CSC8003 Machine Learning	2	2			2	2	Pre-requisite: (STA2300 or STA1003 or STA8170) and CSC1401 or equivalent program and statistical knowledge and skills.
Either the following two courses for the Research Training Track							
SCI8101 Science in Practice					2	1,2	
SCI8102 Research Skills					2	1,2	
or one of the following courses for the Research Project Track (if approved instead of Research Training Track)							
MSC8001 Research Project I *	2	2			2	2	Pre-requisite: Students must be enrolled in one of the following Programs: MCTN or M COP or MCTE or MSCN or MCOO or MADS or have the approval of their program coordinator

Course	Year of program and semester in which course is normally studied						Enrolment requirements
	On-campus (ONC)		External (EXT)		Online (ONL)		
	Year	Sem	Year	Sem	Year	Sem	
or							
MSC8003 Industry Based Research Practice I *	2	2					Pre-requisite: Students must be enrolled in one of the following programs: MSCN or MADS
Year 3 Semester 1							
STA8005 Multivariate Analysis for High-Dimensional Data	3	1			3	1	Pre-requisite or Co-requisite: STA8170 or STA2300 or STA1003
CSC8600 Advanced ICT Professional Project	3	1			3	1	Pre-requisite: CIS5310 and Students must have successfully completed 12 units prior to enrolment in this course
Either the following two courses for the Research Training Track							
SCI8103 Research Fundamentals and Ethics	3	1			3	1	Pre-requisite: Students must be enrolled in one of the following programs: MSCN or MSCR or MCTN or MADS or GCSC or GDSI or DPHD or its equivalent. Enrolment is not permitted in SCI8103 if SCI4405 has been previously completed.
Elective	3	1			3	1	
or one of the following courses for the Research Project Track (if approved instead of Research Training Track)							
MSC8002 Research Project II *	3	1			3	1	Pre-requisite: MSC8001
or							
MSC8004 Industry Based Research Practice II *	3	1			3	1	Pre-requisite: MSC8003

Footnotes

** This course is offered online only in Semester 2.

* Two unit course

Recommended Enrolment Pattern - Full-time (S3 entry)

Students are able to enrol in any offered mode of a course (on-campus, external or online), regardless of the program mode of study they enrolled in.

Students may, with approval of the Program Director and acceptance by an appropriate supervisor, elect to replace two or four units of research training courses ([SCI8101 Science in Practice](#), [SCI8102 Research Skills](#), [SCI8103 Research Fundamentals and Ethics](#) and/or 1 approved course) with one or two 2-unit research project courses ([MSC8001 Research Project I](#) and [MSC8002 Research Project II](#)) or ([MSC8003 Industry Based Research Practice I](#) and [MSC8004 Industry Based Research Practice II](#)).

International students may not be able to enrol in 4 courses for a full time workload in Semester 3.

Course	Year of program and semester in which course is normally studied						Enrolment requirements
	On-campus (ONC)		External (EXT)		Online (ONL)		
	Year	Sem	Year	Sem	Year	Sem	
Year 1 Semester 3							
CSC5020 Foundations of Programming	1	3			1	3	
CIS5310 IS/ICT Project Management					1	3	Enrolment is not permitted in CIS5310 if CIS8010 has been previously completed.
Year 2 Semester 1							
CSC8001 Introduction to Data Science and Visualisation	2	1			2	1	

Course	Year of program and semester in which course is normally studied						Enrolment requirements
	On-campus (ONC)		External (EXT)		Online (ONL)		
	Year	Sem	Year	Sem	Year	Sem	
CIS8025 Big Data Visualisation	2	1			2	1	Enrolment is not permitted in CIS8025 if CIS8701 has been previously completed.
STA8170 Statistics for Quantitative Researchers	2	1			2	1	Enrolment is not permitted in STA8170 if STA2300 or STA1003 has been previously completed.
CIS8008 Business Intelligence	2	1			2	1	
Year 2 Semester 2							
CSC8600 Advanced ICT Professional Project	2	2			2	2	Pre-requisite: CIS5310 and Students must have successfully completed 12 units prior to enrolment in this course
CSC8002 Big Data Management	2	2			2	2	Pre-requisite or Co-requisite: CSC1401 and (STA2300 or STA1003 or STA8170) or equivalent program and statistical knowledge and skills.
CSC8003 Machine Learning	2	2			2	2	Pre-requisite: (STA2300 or STA1003 or STA8170) and CSC1401 or equivalent program and statistical knowledge and skills.
CIS8500 Applied Research for Information System Professionals	2	1			2	1	Pre-requisite: CIS8001 or CIS8008
Year 3 Semester 1							
CSC8004 Data Mining	3	1			3	1	Pre-requisite: (STA2300 or STA1003 or STA8170) and CSC1401
STA8005 Multivariate Analysis for High-Dimensional Data	3	1			3	1	Pre-requisite or Co-requisite: STA8170 or STA2300 or STA1003
Either the following two courses for the Research Training Track							
SCI8101 Science in Practice					3	1	
SCI8102 Research Skills					3	1	
or one of the following courses for the Research Project Track (if approved instead of Research Training Track)							
MSC8001 Research Project I *	3	1			3	1	Pre-requisite: Students must be enrolled in one of the following Programs: MCTN or M COP or MCTE or MSCN or MCCO or MADS or have the approval of their program coordinator
or							
MSC8003 Industry Based Research Practice I *	3	1			3	1	Pre-requisite: Students must be enrolled in one of the following programs: MSCN or MADS
Year 2 Semester 2							
Either the following two courses for the Research Training Track							
SCI8103 Research Fundamentals and Ethics	3	2			3	2	Pre-requisite: Students must be enrolled in one of the following programs: MSCN or M SCR or MCTN or MADS or GCSC or GDSI or DPHD or its equivalent. Enrolment is not permitted in SCI8103 if SCI4405 has been previously completed.
Elective	3	2			3	2	

Consult the Handbook on the Web at <http://www.usq.edu.au/handbook/current> for any updates that may occur during the year.
 Master of Data Science (MADS) - MDS (2021)

Course	Year of program and semester in which course is normally studied						Enrolment requirements
	On-campus (ONC)		External (EXT)		Online (ONL)		
	Year	Sem	Year	Sem	Year	Sem	
or one of the following courses for the Research Project Track (if approved instead of Research Training Track)							
MSC8002 Research Project II *	3	2			3	2	Pre-requisite: MSC8001
or							
MSC8004 Industry Based Research Practice II *	3	2			3	2	Pre-requisite: MSC8003

Footnotes

* Two unit course