

Graduate Certificate in Engineering Science (GCNS) - Grad Cert Eng Sci

CRICOS code (International applicants): 067687K

	On-campus	Distance education
Semester intake:	Semester 1 (February) Semester 2 (July)	Semester 1 (February) Semester 2 (July)
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:	0.5 years full-time or 1 year part-time or by distance education	
Program articulation:	To: Graduate Diploma of Engineering Science	

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: studyeng@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 focus

The [Graduate Certificate in Engineering Science](#) is tailored to provide an exit point from the [Master of Engineering Science](#) program that will enable domestic students to achieve different career goals without having to complete the entire Masters or the Graduate Diploma program. The program, through a specialised suite of technical courses in nine different majors, will equip graduates with academic, personal, professional, and technical knowledge of Engineering and Spatial Science that will allow them to support practising professionals.

Professional accreditation

The [Graduate Certificate in Engineering Science](#) is not accredited by any professional bodies other than the University of Southern Queensland.

Program aims

The primary aims of the [Graduate Certificate in Engineering Science](#) are:

- to enable students, who hold appropriate three year engineering qualifications or equivalent in the relevant specialisation (major field), to complete a postgraduate program that will lead to an advanced level of knowledge in an engineering discipline; and
- to enable students who hold appropriate three or four year engineering qualifications or equivalent in a particular specialisation (major field) to change to another area of specialisation by completing a postgraduate program that will lead to an advanced level of knowledge in an engineering discipline.

Program objectives

Students who successfully complete the [Graduate Certificate in Engineering Science](#) will be able to demonstrate their ability to:

- to enable students to acquire, and demonstrate that they possess, the specified graduate attributes and capabilities;
- to enable students to acquire in-depth technical competence in one of the following fields:
 - Agricultural Engineering
 - Civil Engineering
 - Electrical and Electronic Engineering
 - Environmental Engineering
 - Geographical Information Systems
 - Mechanical Engineering
 - Power Engineering
 - Structural Engineering
 - Surveying
- to enable students from diverse and non-traditional backgrounds and locations to enrol in the program and to provide them with opportunities to acquire the skills necessary to complete the program in the normal time;
- to enable students to be empowered as learners through the provision of a wide range of teaching and learning styles and modes in their program;
- to ensure that all students, regardless of the mode of study, have equality of opportunity in acquiring the specified graduate attributes and capabilities.

Admission requirements

To be eligible for admission to the program, candidates must possess one of the following requirements:

- an appropriate three year engineering degree in the relevant (cognate) specialisation (major field) awarded by an Australian university, or an equivalent qualification awarded by an Australian or overseas institution;
- an appropriate three or four year engineering degree in non-cognate specialisation (major field) awarded by an Australian university, or an equivalent qualification awarded by an Australian or overseas institution.*

* Entrants may need to undertake courses in addition to the recommended structure, which will involve study longer than the normal duration.

International candidates for admission into this program must meet the University's English language proficiency requirements for postgraduate students. Please refer to Section 2.2.3 of the [Admissions Policy](#) .

The standing of degrees awarded by an overseas institution will be determined by reference to the Sydney Accord, and Washington Accord, of which Engineers Australia (EA) is a signatory, and Australia Education International (AEI) which is a federal government agency.

How to apply

Domestic students

[Application for postgraduate programs](#) may be made directly to USQ.

International students

This program is offered to international students. An international student is a person who is not an Australian or New Zealand citizen and not an Australian permanent resident. Please refer to [USQ International](#) for information about entry requirements, visa arrangements and how to apply.

Program fees

Commonwealth supported place

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

Permanent Humanitarian Visa holders, Permanent Resident visa holders and New Zealand citizens who reside outside Australia pay full tuition fees.

Domestic full fee paying students may be eligible to defer their fees through a Government loan called [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. You are able to calculate the fees for a particular course via the [Course Fee Finder](#).

Program structure

The [Graduate Certificate in Engineering Science](#) comprises four single unit academic courses as follows:

Schedule A: One core course (One unit)

- [ENG5001 Professional Skills in Engineering](#)

Schedule B: A Three course major (Three units)

Required time limits

Full-time students have a maximum of one year to complete this program. Part-time students have a maximum of two years to complete this program.

A pro-rata adjustment of the maximum time period will apply for those students who transfer from one mode of study to another. A pro-rata reduction in the maximum time period will apply to students who are admitted to a program with advanced standing.

Major studies objectives

The major study provides students with knowledge and skills in a specific discipline. The nine major study areas in the [Graduate Certificate in Engineering Science](#) are:

Agricultural Engineering
Civil Engineering
Electrical and Electronic Engineering
Environmental Engineering
Geographical Information Systems
Mechanical Engineering
Power Engineering
Structural Engineering
Surveying

IT requirements

Students should refer to the section entitled Access to Information Technology Facilities in the General Faculty and Program Information section of this Handbook.

Articulation

The [Graduate Certificate in Engineering Science](#), the [Graduate Diploma of Engineering Science](#), and the [Master of Engineering Science](#) are a nested suite of programs. Students who have completed the [Graduate Certificate in Engineering Science](#) are able to apply to articulate with full credit to the [Graduate Diploma of Engineering Science](#).

Exit points

Students who are unable to satisfactorily complete the program may apply to transfer to the [Bachelor of Engineering](#) or the [Bachelor of Spatial Science](#) as appropriate. They may also apply to have the courses completed in the [Graduate Certificate in Engineering Science](#) credited to their new program.

Exemptions

For the Graduate Certificate in Engineering Science no exemptions will be permitted. Candidates who have completed the same or similar courses at USQ or similar courses at another institution should, with the approval of the Program Coordinator, apply to vary their enrolment pattern on the basis of prior study.

Enrolment

Students should note that some of the courses specify enrolment requirements (prerequisites). Students should therefore refer to the Course Specification section of the USQ Web to determine the enrolment requirements for the courses they intend enrolling in. Students should avoid enrolling in courses for which they do not have sufficient pre-requisite knowledge. Students will be expected to rectify any deficiencies in their pre-requisite knowledge by private study, guided if necessary by the examiners of the relevant courses. Students should contact Faculty Administration if they encounter problems while enrolling in courses with requisites.

Agricultural Engineering Major recommended enrolment pattern

Major study: Agricultural Engineering (Major Study Code: 16197)							
Course	Year of program and semester in which course is normally studied						Enrolment requirements
	On-campus (ONC)		External (EXT)		Online (WEB)		
	Year	Sem	Year	Sem	Year	Sem	
Schedule A: Core Courses Students must complete the one course listed in Schedule A.							
ENG5001 Professional Skills in Engineering	1	1,2	1	1,2			
Schedule B: Major Courses Students must complete three of the courses listed in Schedule B.							
ENG3103 Engineering Problem Solving Computations	1	2	1	2		Pre-requisite: (ENG2102 and MAT1502) or Students must be enrolled in one of the following Programs: GCEN or GDET or METC or MEPR or GCNS or GDNS or MENS	
ENV3104 Hydraulics II	1	1	1	1		Pre-requisite: ENV1101 or ENV2103 or Students must be enrolled in one of the following Programs: GCEN or GDET or METC or MEPR or GCNS or GDNS or MENS	
AGR3305 Precision and Smart Technologies in Agriculture	1	1	2	1			
ENV5205 Solid and Liquid Waste Treatment[^]	2	1		1		Pre-requisite: ENV4203 or ENV4204 or Students must be enrolled in one of the following Programs: GCEN or GDET or METC or MEPR or GCNS or GDNS or MENS	
AGR4305 Agricultural Soil Mechanics	2	1	4				

Major study: Agricultural Engineering (Major Study Code: 16197)							
Course	Year of program and semester in which course is normally studied						Enrolment requirements
	On-campus (ONC)		External (EXT)		Online (WEB)		
	Year	Sem	Year	Sem	Year	Sem	
AGR3303 Agricultural Materials and Post-Harvest Technologies	2	1	3	1			
ENV4106 Irrigation Science	2	2	3	2			Pre-requisite: AGR3304 or Students must be enrolled in one of the following Programs: GCEN or GDET or METC or MEPR or GCNS or GDNS or MENS

Footnotes

^ This course is not offered in the on-campus mode. On-campus students should enrol in the external mode of this course

Civil Engineering Major recommended enrolment pattern

Major study: Civil Engineering (Major Study Code: 16198)							
Course	Year of program and semester in which course is normally studied						Enrolment requirements
	On-campus (ONC)		External (EXT)		Online (WEB)		
	Year	Sem	Year	Sem	Year	Sem	
Schedule A: Core Courses Students must complete the one course listed in Schedule A.							
ENG5001 Professional Skills in Engineering	1	1,2	1	1,2			
Schedule B: Major Courses Students must complete three of the courses listed in Schedule B.							
ENG3103 Engineering Problem Solving Computations	1	2	1	2			Pre-requisite: (ENG2102 and MAT1502) or Students must be enrolled in one of the following Programs: GCEN or GDET or METC or MEPR or GCNS or GDNS or MENS
CIV3403 Geotechnical Engineering	1	2	2	2			Pre-requisite: CIV2401 or CIV2403 or Students must be enrolled in one of the following Programs: GCEN or GDET or METC or MEPR or GCNS or GDNS or MENS
CIV3505 Structural Analysis	1	1	2	1			Pre-requisite: MEC2402 and MAT1502 or Students must be enrolled in one of the following Programs: GCEN or GDET or METC or MEPR or GCNS or GDNS or MENS
CIV3506 Concrete Structures	1	1	2	1			Pre-requisite: CIV2503 or Students must be enrolled in one of the following Programs: GCEN or GDET or METC or MEPR or GCNS or GDNS or MENS
CIV5704 Road and Street Engineering	2	2	2	2			
ENV3104 Hydraulics II	2	1	3	1			Pre-requisite: ENV1101 or ENV2103 or Students must be enrolled in one of the following Programs: GCEN or GDET or METC or MEPR or GCNS or GDNS or MENS
CIV4508 Structural Design II	2	1	3	1			Pre-requisite: CIV3505 and CIV3506 or Students must be enrolled in one of the following Programs: GCEN or GDET or METC or MEPR or GCNS or GDNS or MENS

Electrical and Electronic Engineering Major recommended enrolment pattern

Major study: Electrical and Electronic Engineering (Major Study Code: 16199)							
Course	Year of program and semester in which course is normally studied						Enrolment requirements
	On-campus (ONC)		External (EXT)		Online (WEB)		
	Year	Sem	Year	Sem	Year	Sem	
Schedule A: Core Courses Students must complete the one course listed in Schedule A.							
ENG5001 Professional Skills in Engineering	1	1,2	1	1,2			
Schedule B: Major Courses Students must complete three of the courses listed in Schedule B.							
ELE4605 Fields and Waves	1	1	3	1		Pre-requisite: (MAT1502 and ELE2103 and ELE2601) or Students must be enrolled in the following Program: MEPR or MENS	
ELE3107 Signal Processing	1	2		2			
ELE3105 Computer Controlled Systems	2	1		1		Pre-requisite: ELE2103 or Students must be enrolled in one of the following Programs: GCNS or GCEN or GDNS or MEPR or MENS or METC	
ELE3305 Computer Systems and Communications Protocols	2	1	1	1			
ELE4606 Communication Systems	2	2	4	2		Pre-requisite: (ELE2504 and ELE2601) or Students must be enrolled in one of the following Programs: GCEN or GDET or METC or MEPR or MENS	

Environmental Engineering Major recommended enrolment pattern

Major study: Environmental Engineering (Major Study Code: 16200)							
Course	Year of program and semester in which course is normally studied						Enrolment requirements
	On-campus (ONC)		External (EXT)		Online (WEB)		
	Year	Sem	Year	Sem	Year	Sem	
Schedule A: Core Courses Students must complete the one course listed in Schedule A.							
ENG5001 Professional Skills in Engineering	1	1,2	1	1,2			
Schedule B: Major Courses Students must complete three of the courses listed in Schedule B.							
ENG3103 Engineering Problem Solving Computations	1	2	1	2		Pre-requisite: (ENG2102 and MAT1502) or Students must be enrolled in one of the following Programs: GCEN or GDET or METC or MEPR or GCNS or GDNS or MENS	
AGR3304 Soil Science	1	1	2	1			
ENV3104 Hydraulics II	1	1	2	1		Pre-requisite: ENV1101 or ENV2103 or Students must be enrolled in one of the following Programs: GCEN or GDET or METC or MEPR or GCNS or GDNS or MENS	
ENV5205 Solid and Liquid Waste Treatment^A	2	1	3	1		Pre-requisite: ENV4203 or ENV4204 or Students must be enrolled in one of the following Programs: GCEN or GDET or METC or MEPR or GCNS or GDNS or MENS	
ENV4204 Environmental Technology	2	1	3	1		Pre-requisite: MAT1100 or MAT1500 or Students must be enrolled in one of the following programs: GCEN or GDET or METC or MENS or GCNS or GDNS or MSST	
ENV4107 Water Resources Engineering	2	2	3	2		Pre-requisite: (ENV3104 and ENV3105) or Students must be enrolled in one of the following Programs: GCEN or GDET or METC	

Major study: Environmental Engineering (Major Study Code: 16200)							
Course	Year of program and semester in which course is normally studied						Enrolment requirements
	On-campus (ONC)		External (EXT)		Online (WEB)		
	Year	Sem	Year	Sem	Year	Sem	
							or MEPR or GCNS or GCEN or GDNS or MENS
ENV4203 Public Health Engineering	1	2	4	2			Pre-requisite: ENV1101 or ENV2103 or Students must be enrolled in one of the following Programs: GCEN or GDET or METC or MEPR or GCNS or GDNS or MENS

Footnotes

^ This course is not offered in the on-campus mode. On-campus students should enrol in the external mode of this course.

Geographical Information Systems Major recommended enrolment pattern

Major study: Geographical Information Systems (Major Study Code: 16201)							
Course	Year of program and semester in which course is normally studied						Enrolment requirements
	On-campus (ONC)		External (EXT)		Online (WEB)		
	Year	Sem	Year	Sem	Year	Sem	
Schedule A: Core Courses Students must complete the one course listed in Schedule A.							
ENG5001 Professional Skills in Engineering	1	1,2	1	1,2			
Schedule B: Major Courses Students must complete three of courses listed in Schedule B.							
ENG3103 Engineering Problem Solving Computations	1	2	1	2			Pre-requisite: (ENG2102 and MAT1502) or Students must be enrolled in one of the following Programs: GCEN or GDET or METC or MEPR or GCNS or GDNS or MENS
GIS3405 Spatial Analysis and Modelling	1	2	2	2			
GIS3406 Remote Sensing and Image Processing	1	2	2	2			
SVY4203 Urban and Regional Planning	1	1	1	1			
SVY3202 Photogrammetry and Remote Sensing	1	1	1	1			
GIS4407 Web Based Geographic Information System	2	2	3	2			Pre-requisite: GIS1402 or Students must be enrolled in one of the following Programs: GCGS or GDST or MSST or GCNS or GCST or GDNS or MENS

Mechanical Engineering Major recommended enrolment pattern

Major study: Mechanical Engineering (Major Study Code: 16202)							
Course	Year of program and semester in which course is normally studied						Enrolment requirements
	On-campus (ONC)		External (EXT)		Online (WEB)		
	Year	Sem	Year	Sem	Year	Sem	
Schedule A: Core Courses Students must complete the one course listed in Schedule A.							
ENG5001 Professional Skills in Engineering	1	1,2	1,2	1,2			
Schedule B: Major Courses Students must complete three of the courses listed in Schedule B.							
ENG3103 Engineering Problem Solving Computations	1	2	1,2	2			Pre-requisite: (ENG2102 and MAT1502) or Students must be enrolled in one of the following Programs: GCEN or GDET or METC or MEPR or GCNS or GDNS or MENS
MEC3102 Fluid Mechanics	2	1	3	1			Pre-requisite: (MAT2500 and MEC2101) or Students must be enrolled in one of the following Programs: GCEN or GDET or METC or MEPR or GCNS or GDNS or MENS

Major study: Mechanical Engineering (Major Study Code: 16202)							
Course	Year of program and semester in which course is normally studied						Enrolment requirements
	On-campus (ONC)		External (EXT)		Online (WEB)		
	Year	Sem	Year	Sem	Year	Sem	
ENG4104 Engineering Problem Solving Simulations	2	1	4	1			Pre-requisite: ENG3103 or Students must be enrolled in one of the following Programs: GCEN or GDET or METC or MEPR or GCNS or GDNS or MENS
MEC3302 Computational Mechanics in Design	1	1	2	1			Pre-requisite: (MEC2304 and MEC2401 and MEC2402) or Students must be enrolled in one of the following Programs: GCEN or GDET or METC or MEPR or GCNS or GDNS or MENS
MEC3303 System Design	1	2	3	2			Pre-requisite: MEC2301 or Students must be enrolled in one of the following Programs: GCEN or GDET or METC or GCNS or GDNS or MEPR or MENS
MEC3403 Dynamics II	2	2	4	2			Pre-requisite: (MEC2401 and MAT2500) or Students must be enrolled in one of the following Programs: GCEN or GDET or METC or MEPR or GCNS or GDNS or MENS

Power Engineering Major recommended enrolment pattern

Major study: Power Engineering (Major Study Code: 16203)							
Course	Year of program and semester in which course is normally studied						Enrolment requirements
	On-campus (ONC)		External (EXT)		Online (WEB)		
	Year	Sem	Year	Sem	Year	Sem	
Schedule A: Core Courses Students must complete the one course listed in Schedule A.							
ENG5001 Professional Skills in Engineering	1	1,2	1	1,2			
Schedule B: Major Courses Students must complete three of the courses listed in Schedule B.							
ENG3103 Engineering Problem Solving Computations	1	2	1	2			Pre-requisite: (ENG2102 and MAT1502) or Students must be enrolled in one of the following Programs: GCEN or GDET or METC or MEPR or GCNS or GDNS or MENS
ELE3307 Real Time Systems	1	2		2			Pre-requisite: ELE1301 or Students must be enrolled in one of the following Programs: GCEN or GDET or METC or MENS
ELE3305 Computer Systems and Communications Protocols	1	1		1			
ELE3803 Electrical Plant	2	1		1			Pre-requisite: ELE1801 or Students must be enrolled in one of the following Programs: GCEN or GDET or METC or MEPR or GCNS or GDNS or MENS
ELE3805 Power Electronics Principles and Applications	2	2	4	1			Pre-requisite: (ELE1502 and ELE1801) or Students must be enrolled in one of the following Programs: GCEN or GDET or METC or MEPR or GCNS or GDNS or MENS
ELE3807 Power Systems Analysis	2	1	3	1			

Structural Engineering Major recommended enrolment pattern

Major study: Structural Engineering (Major Study Code: 16204)							
Course	Year of program and semester in which course is normally studied						Enrolment requirements
	On-campus (ONC)		External (EXT)		Online (WEB)		
	Year	Sem	Year	Sem	Year	Sem	
Schedule A: Core Courses Students must complete the one course listed in Schedule A.							
ENG5001 Professional Skills in Engineering	1	1,2	1	1,2			
Schedule B: Major Courses Students must complete three of the courses listed in Schedule B.							
ENG3103 Engineering Problem Solving Computations	1	2	1	2		Pre-requisite: (ENG2102 and MAT1502) or Students must be enrolled in one of the following Programs: GCEN or GDET or METC or MEPR or GCNS or GDNS or MENS	
CIV3403 Geotechnical Engineering	1	2	2	2		Pre-requisite: CIV2401 or CIV2403 or Students must be enrolled in one of the following Programs: GCEN or GDET or METC or MEPR or GCNS or GDNS or MENS	
CIV3505 Structural Analysis	1	1	2	1		Pre-requisite: MEC2402 and MAT1502 or Students must be enrolled in one of the following Programs: GCEN or GDET or METC or MEPR or GCNS or GDNS or MENS	
CIV3506 Concrete Structures	1	1	2	1		Pre-requisite: CIV2503 or Students must be enrolled in one of the following Programs: GCEN or GDET or METC or MEPR or GCNS or GDNS or MENS	
CIV4508 Structural Design II	2	1	3	1		Pre-requisite: CIV3505 and CIV3506 or Students must be enrolled in one of the following Programs: GCEN or GDET or METC or MEPR or GCNS or GDNS or MENS	
ENG8802 Advanced Prestressed Concrete]	2	2	4			2	
ENG8803 Mechanics and Technology of Fibre Composites			4			1	

Footnotes

] Offered Odd Years Only

Surveying Major recommended enrolment pattern

Major study: Surveying (Major Study Code: 16205)							
Course	Year of program and semester in which course is normally studied						Enrolment requirements
	On-campus (ONC)		External (EXT)		Online (WEB)		
	Year	Sem	Year	Sem	Year	Sem	
Schedule A: Core Courses Students must complete the one course listed in Schedule A.							
ENG5001 Professional Skills in Engineering	1	1,2	1	1,2			
Schedule B: Major Courses Students must complete three of the courses listed in Schedule B.							
ENG3103 Engineering Problem Solving Computations	1	2	1	2		Pre-requisite: (ENG2102 and MAT1502) or Students must be enrolled in one of the following Programs: GCEN or GDET or METC or MEPR or GCNS or GDNS or MENS	
SVY3202 Photogrammetry and Remote Sensing	2	1	4	1			
SVY2105 Survey Computations B	1	2	2	2		Pre-requisite: SVY2106 or Students must be enrolled in one of the following Programs: GCNS or GCST or GDNS or GDST or MSST or MENS	
SVY4203 Urban and Regional Planning	1	1		1			

Major study: Surveying (Major Study Code: 16205)							
Course	Year of program and semester in which course is normally studied						Enrolment requirements
	On-campus (ONC)		External (EXT)		Online (WEB)		
	Year	Sem	Year	Sem	Year	Sem	
SVY3107 Geodetic Surveying B	1	2	2	2			Pre-requisite: SVY1110 or Students must be enrolled in one of the following Programs: GCNS or GCST or GDNS or GDST or MSST or MENS
SVY3304 Cadastral Surveying	1	2	2	2			Pre-requisite: (SVY1102 and SVY1104) or Students must be enrolled in one of the following Programs: GCNS or GCST or GDNS or GDST or MSST or MENS