

## Bachelor of Spatial Science (BSPS) - BSpSc

CRICOS code (International applicants): 053511E

	On-campus	Distance education
<b>Semester intake:</b>	Semester 1 (March) Semester 2 (July)	Semester 1 (March) Semester 2 (July) Semester 3 (November)
<b>Campus:</b>	Toowoomba	-
<b>Fees:</b>	Commonwealth supported place International full fee paying place	Commonwealth supported place International full fee paying place
<b>Standard duration:</b>	4 years full-time, 8 years part-time or external	
<b>Program articulation:</b>	From: <a href="#">Associate Degree in Spatial Science</a> ; <a href="#">Bachelor of Spatial Science Technology</a> To: <a href="#">Master of Spatial Science Research</a> , ; <a href="#">Master of Spatial Science Technology</a>	

### Contact us

Future Australian and New Zealand students	Future International students	Current students
<a href="#">Ask a question</a> Freecall (within Australia): 1800 640 678 Phone (from outside Australia): +61 7 4631 5315 Email: <a href="mailto:studyeng@usq.edu.au">studyeng@usq.edu.au</a>	<a href="#">Ask a question</a> Phone: +61 7 4631 5543 Email: <a href="mailto:international@usq.edu.au">international@usq.edu.au</a>	<a href="#">Ask a question</a> Freecall (within Australia): 1800 007 252 Phone (from outside Australia): +61 7 4631 2285 Email <a href="mailto:usqassist@usq.edu.au">usqassist@usq.edu.au</a>

### Geographic Information Systems major

The program provides students with the educational requirements to become a professional spatial scientist and equips them with a core of basic theoretical, scientific, analytical, managerial, professional, research and communication skills that will permit them to undertake an in-depth study of the fundamental science and practice of Geographic Information Systems (GIS). Additionally, students obtain knowledge of the natural, legal, commercial, industrial and social environments in which they will function as professionals.

### Career opportunities

Professional in Geographic Information Systems (GIS), cartography and mapping in Local, State and Commonwealth Government agencies, private practice and organisations supported by GIS management, land development, planning, mapping and data visualisation.

### Surveying major

This program provides students with the knowledge to apply new technologies, such as the satellite-based Global Positioning System, Geographic Information Systems and Land Information Systems, to a broad range of surveying projects including land development, mapping, engineering and mining. Students will gain the skills required to find unique solutions to problems – solutions that are expected to be both socially and environmentally responsible. Students will use advanced skills and knowledge acquired in analysis, measurement science and computing to complete surveying and spatial information projects. The Bachelor of Spatial Science may be awarded with Honours to high achieving students.

## Career opportunities

Professional Surveyor in property surveying, land development, land information, mapping, engineering projects or the mining industry with private organisations, and State, Commonwealth and Local Government agencies.

## Professional accreditation

The Bachelor of Spatial Science (Surveying) is fully accredited by the Surveyors Board of Queensland and is recognised in every Australian state and in New Zealand through reciprocal arrangements. The degree, together with relevant industry experience, enables registration and/or licensing as a professional surveyor with the Boards of Surveyors in Australia and New Zealand.

The Spatial Science Institute has accredited both program majors and graduates are eligible for membership with the [Spatial Sciences Institute Australia](#).

## Program aims

The Bachelor of Spatial Science program provides students with the educational requirements to become a professional spatial scientist and the ability to undertake postgraduate studies. The program equips students with a core of basic theoretical, scientific, analytical, managerial, professional, research and communication skills that will permit them to undertake an in-depth study of the fundamental science and practice of spatial science in one of two fields: Geographic Information Systems (GIS) or Surveying.

In addition, students obtain knowledge of the natural, legal, commercial, industrial and social environments in which they will function as professionals. The program instils in students the need for continuing professional development and gives them the ability to adapt to change.

The program is designed to identify, and award honours to, students who have the capacity to undertake study at an advanced level and to make an original contribution to the fundamental science and practice of spatial science. The award of honours will be determined by academic performance and is normally based on a student's grade point average (GPA).

## Program objectives

A student who successfully completes the Bachelor of Spatial Science should be able to demonstrate:

- a broad knowledge of basic scientific and technical skills
- a high level of computer literacy skills appropriate to their field of study
- a high level of written and oral communication skills
- a capacity for analysis, evaluation and synthesis
- an understanding of, and ability to undertake, the processes required to collect, store, and manipulate a variety of spatial data
- a capacity to adapt to change and to apply innovation
- an understanding of the natural, social, professional, industrial and technical environments in which they will practice
- a knowledge of professional journals and other information sources related to the spatial science industry, the skills required to access information from those sources, and an aptitude to undertake further learning and study
- an ability to undertake applied research in a field of the spatial science discipline
- a knowledge of the financial and management principles and practices that are used to manage a professional office
- a knowledge of surveying or spatial information systems of sufficient depth to gain employment, certification and, where appropriate, registration as a Professional Surveyor or Spatial Scientist.

## Admission requirements

**Applicants shall normally:**

- have studied four semester units and achieved an exit assessment of 'Sound Achievement' or better in each of the following Queensland Senior Secondary School subjects: English and Mathematics B. It is recommended that applicants should also have satisfactorily completed the subject: Physics

or

- be able to demonstrate that they have achieved an equivalent standard in these subjects at another institution and
- **Australian applicants:** have achieved a Queensland Overall Position (OP) band, or an equivalent Rank based on qualifications and previous work experience, at or above the specified cut-off level
- **International applicants:** must have met the University's [English language](#) requirements or have completed the University's [ELICOS/UNIPREP](#) program.

## How to apply

### Domestic students

[Application for undergraduate programs](#) may be made through the Queensland Tertiary Admissions Centre (QTAC). The same procedure applies whether you plan to study on-campus or by distance education.

If you completed Year 12 at a Queensland secondary school you will be assessed for entry on the basis of your Overall Position (OP) or equivalent score. Year 12 students from other states or territories are considered for entry on the basis of their UAI, ENTER or TER and the subject prerequisites indicated. Other applicants will be based on their overall Rank. You should ensure you submit your application by the [closing dates](#).

### 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](#).

### 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 Bachelor of Spatial Science is a 32-unit program consisting of Academic courses and Practice courses. Academic courses are normally one-unit courses and involve approximately 155 hours of student work per unit.

Practice courses are zero unit courses and each involves approximately 50 hours of student work. The only grades available for a Practice Course are Pass (P) and Fail (F). A Practice Course is designed to enable students to acquire specific competencies associated with their major study. The competencies range from specific practical and communication skills through to generic competencies relating to ethical and social responsibility, awareness of the environment, teamwork, etc. For an external student a Practice Course generally involves attendance on-campus for a one-week residential school.

The components of the program are shown in the following table:

Program Component	Academic Courses		Practice Courses	
	Number of Courses	Units	Number of Courses	Units
Core Studies	20	20	3	0
Major Study	12	12	2-3 depending upon the major	0
Total	32	32	5-6	0

## Program completion requirements

The Bachelor of Spatial Science Program normally involves four years of full-time study or eight years of part-time study.

Students must complete the program within a maximum period of six years of full-time study, or 12 years of part-time study, from the date of their initial enrolment. To graduate from a particular major students must successfully complete all of the core courses plus the specialist and Practice courses in that major, including the required number of Electives.

## Required time limits

Full-time students have a maximum of six years to complete this program. Part-time students have a maximum of 12 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.

## Practical experience

Practical experience is desirable and encouraged but is not required for the completion of the Bachelor of Spatial Science program. Students are encouraged to obtain practical experience during vacation periods.

## 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.

## Residential schools

External students are required to attend a number of [residential schools](#) during their program. These are associated with Practice courses and are normally conducted at the end of Semester 3 (February), or during the mid-semester recess in Semester 2 (September/October).

## Articulation

The University of Southern Queensland offers a unique range of Surveying and Geographic Information Systems (GIS) majors within its suite of Spatial Science programs. The Spatial Science education model provides the basic educational requirement for each level of the surveying and geographic information workforce, and clearly defined articulation Pathways for those wishing to upgrade their existing qualifications. All of the programs are offered in both the on-campus and external mode.

Graduates of an Associate Degree in Spatial Science, would normally be eligible for up to 16 units of credit towards the Bachelor of Spatial Science Technology within the same field. Similarly, Bachelor of Spatial Science Technology graduates would normally be eligible for up to 24 units of credit towards the Bachelor of Spatial Science degree within the same field.

Students who have completed an associate degree or certificate program in surveying more than five years ago are eligible to claim advanced standing. The number of units of advanced standing granted will depend upon the nature and currency of the studies undertaken, and on the major study undertaken.

The programs in Surveying and Geographic Information Systems also articulate to and from each other and enable students to move between Surveying and Geographic Information Systems degrees, whilst still retaining a significant amount of credit.

Prospective students who wish to upgrade an existing qualification should contact the Faculty to obtain information about likely exemptions and recommended enrolment patterns for their upgrade program.

## Exit points

Students who, for whatever reason, are unable to complete the Bachelor of Spatial Science and who satisfy all of the requirements of either the [Bachelor of Spatial Science Technology](#), the [Associate Degree in Spatial Science](#) or the Diploma of Engineering Studies (refer back to the 2006 USQ Handbook), may be permitted to exit with that award.

## Honours

The Bachelor of Spatial Science may be awarded with Honours. The class of honours to be awarded to a student is dependent upon:

- the Grade Point Average calculated from the grades achieved in the courses studied in, or transferred to, the program
- the grade achieved by the student in the courses [ENG4111 Research Project Part 1](#) and [ENG4112 Research Project Part 2](#) (unless the student is exempted from these courses).

The minimum levels of achievement normally required for each class of honours are shown in the following table. To be assured of achieving a particular class of honours students must have achieved the specified grade in the research project courses and the minimum GPA requirements for all of the courses studied, for the last 16 courses studied, or for the last eight courses studied.

Class of Honours	GPA Calculated from the Grades Achieved in:			Minimum Grade Achieved in Research Project Courses
	All Courses Studied in the Program	The Last 16 Courses Studied*#	The Last Eight Courses Studied*#	
First Class Honours	<b>6.0</b>	<b>6.2</b>	<b>6.5</b>	<b>A</b>
Second Class Honours - Division A	<b>5.5</b>	<b>5.7</b>	<b>5.9</b>	<b>B</b>
Second Class Honours - Division B	<b>5.0</b>	<b>5.1</b>	<b>5.3</b>	<b>C</b>
Minimum number of courses required	<b>20</b>	<b>16</b>	<b>8</b>	

### Footnotes

\* The results from courses [ENG4111](#) and [ENG4112](#) must be included (unless the student is exempted from these courses).

# The best results in a semester are to be used when not all of the results from a semester are required.

## Geographic Information Systems Major

To satisfy the requirements of the program students must complete all of the Academic and Practice courses in the following table that shows the recommended enrolment patterns for on-campus and external students for our Toowoomba campus. Students following a non-standard enrolment pattern should consult the [course synopses](#) section of this Handbook to ascertain if a course is offered in another term.

### Practice courses

The majority of the practical and professional experience requirements for the program are contained within the major recommended enrolment pattern in the following table. These are zero unit courses, which are a **compulsory part** of the program, however they do not attract a student contribution charge for Australian Residents or a tuition fee for international students.

## Residential Schools

Students enrolled in the external offer of a Practice Course **must attend** the residential school for that course. In some cases students enrolled in the on-campus mode may also be required to attend the residential school. Students should only enrol in a Practice Course when they are able to attend the residential school for that course. Practice courses **may not** be taken earlier than shown except with the permission of the Program Coordinator responsible for the program. In some cases students may enrol in two Practice courses in one term so they can complete the two residential schools in a two-week period. The actual dates for each residential school are shown in the [Residential School schedule](#) in this Handbook.

Safety boots are compulsory in engineering laboratories for several of the Practice courses and are strongly recommended for all other Practice courses.

## Elective courses

Elective courses are included in the list of Academic courses. Students should select these courses from the Electives table. Students may undertake only one appropriate level 5 or level 8 course from this program or another program in the Faculty of Engineering and Surveying as an Elective with the approval of the Head of Discipline.

## Geographic Information Systems Major recommended enrolment pattern

Major study: Geographic Information Systems (Major Study Code: 15407)								
Course	Year of program and semester in which course is normally studied						Residential school (compulsory /optional)	Enrolment requirements
	On-campus (ONC)		External (EXT)		Online (WEB)			
	Year	Sem	Year	Sem	Year	Sem		
<b>Academic Courses</b>								
<a href="#">MAT1500 Engineering Mathematics 1</a>	1	1	1	1			OE	
<a href="#">GIS1401 Geographic Data Presentation</a>	1	1	1	1				
<a href="#">SVY1102 Surveying A</a>	1	1	2	1				
<a href="#">ENG1101 Engineering Problem Solving 1</a>	1	1	2	1,2				
<a href="#">GIS1402 Geographic Information Systems</a>	1	2	1	2				
<a href="#">ENG1001 Principles of Professional Engineering and Surveying&gt;</a>	1	1,2	1	1,2				
<a href="#">SVY1110 Introduction to Global Positioning System</a>	1	2	2	2				
<a href="#">CSC1401 Foundation Programming</a>	1	2	2	1,2				
<a href="#">MAT1502 Engineering Mathematics 2()</a>	2	2	3	2				
<a href="#">SVY3202 Photogrammetry and Remote Sensing</a>	2	1	3	1				
<a href="#">GIS3404 Geographic Data Visualisation+</a>	2	1	4	1				
<a href="#">SVY2106 Geodetic Surveying A</a>	2	1	4	1			Pre-requisite: <a href="#">SVY1110</a>	
Elective	2	2	3	2				
<a href="#">ENG2102 Engineering Problem Solving 2</a>	2	2	3	2			Pre-requisite: <a href="#">ENG1101</a>	
<a href="#">GIS2403 Land Management Systems</a>	2	2	4	2				
<a href="#">GIS3405 Spatial Analysis and Modelling+</a>	2	2	4	2			OE	
<a href="#">ENG2002 Technology and Society</a>	3	1	5	1,3				
<a href="#">CIS2002 Database Design</a>	3	1	5	1,3			OE	
<a href="#">ENV2201 Land Studies</a>	3	1	6	1				
<a href="#">CSC2402 Object-Oriented Programming in C++</a>	3	1	6	1,3			Pre-requisite: <a href="#">CSC1401</a> or <a href="#">USQIT16</a> or Students must be enrolled in one of the following Programs: <a href="#">MPIT</a> or <a href="#">GDGS</a> or <a href="#">GCEN</a> or <a href="#">GDET</a> or <a href="#">METC</a>	
Elective	3	2	5	2				
<a href="#">SVY4306 Land Law and Valuation</a>	3		5	2				
<a href="#">GIS3406 Remote Sensing and Image Processing+</a>	3	2	6	2				

Major study: Geographic Information Systems (Major Study Code: 15407)									
Course	Year of program and semester in which course is normally studied						Residential school (compulsory /optional)	Enrolment requirements	
	On-campus (ONC)		External (EXT)		Online (WEB)				
	Year	Sem	Year	Sem	Year	Sem			
<a href="#">GIS4407 Web Based Geographic Information System+</a>	3	2	6	2				Pre-requisite: <a href="#">GIS1402</a> or S tudents must be enrolled in one of the following Program s: GCGS or GDGS or MSST	
<a href="#">SVY4309 Practice Management for Spatial Scientists+</a>	4	1	7	1					
<a href="#">ENG4111 Research Project Part 1<sup>^+</sup></a>	4	1	7	1				<b>OE</b>	
<a href="#">CSC2406 Web Publishing</a>	4	1	7	1,3				Pre-requisite: <a href="#">CSC1401</a> or USQIT16 or Students must be enrolled in one of the fol lowing Programs: MPIT or MSBN <b>OE</b>	
<a href="#">SVY4203 Urban and Regional Planning</a>	4	1	8	1					
<a href="#">ACC1101 Accounting for Decision-Making&gt;</a>	4	2	7	1,2,3				<b>OE</b>	
Elective	4	2	7	2					
Elective	4	2	8	2					
<a href="#">ENG4112 Research Project Part 2<sup>^++</sup></a>	4	2	8	2				Pre-requisite: <a href="#">ENG4111</a> <b>OE</b>	
<b>Practice Courses</b>									
<a href="#">SVY1901 Surveying Practice 1</a>	1	1	2	3			C	<b>OE</b>	
<a href="#">GIS2901 ^~</a>	2		4	3			C		
<a href="#">GIS3901 ~</a>	3		5	2			C		
<a href="#">ENG3902 %</a>	3	2	7	2			C		
<a href="#">ENG4903 Professional Practice 2</a>	4	1	8	2			C	Pre-requisite: <a href="#">ENG3902</a> <b>OE</b>	

#### Footnotes

- > The on-campus offering of this course has been timetabled for Semester 2. Students may consider the alternative semester however they may experience timetable clashes.
- () [MAT1102 Algebra and Calculus I](#) may be studied in Semester 1 as an alternate course to the Semester 2 offering of [MAT1502 Engineering Mathematics 2](#), in order to provide a balanced workload between semesters.
- + The semester 1 on-campus offering of this course has been cancelled for 2009.
- ^ It is recommended that these courses are undertaken in the same academic year.
- ++ It is recommended that students in the Bachelor of Spatial Science should also be enrolled in [ENG4903](#) while undertaking this course.
- ~ On-campus students should enrol in the external offering of this course.
- % Students must study [ENG3902](#) in their penultimate year.
- OE** Before enrolling in this course students must check that they have satisfied the 'Recommended prior study' or 'Other enrolment' requirements set out in the Other requisites section of the course specification.

#### Notes:

For students transferring from one program to another a complete list of enrolment requirements are available in the [course synopses](#) section of this Handbook.

## Geographic Information Systems Major Elective courses

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	
<a href="#">CIS3001 Object-Oriented Programming with Java</a>		1		1			<b>OE</b>
<a href="#">CIV2701 Road Design and Location</a>		1		1			Pre-requisite: ( <a href="#">ENG1100</a> or <a href="#">GIS1401</a> ) and ( <a href="#">SVY1102</a> or <a href="#">SVY1101</a> or <a href="#">SVY1110</a> )
<a href="#">ENV4204 Environmental Technology</a>		1		1			
<a href="#">ENG3003 Engineering Management</a>		1		1,3			<b>OE</b>
<a href="#">MGT1000 Organisational Behaviour</a>		1		1,2,3			<b>OE</b>
<a href="#">MKT1001 Introduction to Marketing</a>		1		1,2,3			<b>OE</b>
<a href="#">AGR2301 Agricultural Science</a>		2		2			
<a href="#">CIV2702 Municipal Services</a>		2		2			Pre-requisite: <a href="#">ENV1101</a>

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	
<a href="#">ENV2102 Applied Hydrology+</a>		2		2			OE
<a href="#">LAW2107 Environmental Law</a>		2		2			OE
REN3302 Sustainable Resource Use		2					
<a href="#">SVY1104 Survey Computations A</a>		2		2			Pre-requisite: <a href="#">SVY1102</a>

#### Footnotes

+ The semester 2 on-campus offering of this course has been cancelled for 2009.

OE Before enrolling in this course students must check that they have satisfied the 'Recommended prior study' or 'Other enrolment' requirements set out in the Other requisites section of the course specification.

#### Notes:

Other courses may be admissible as an Elective. However students must obtain approval from the relevant Head or Program Coordinator prior to enrolling in the course. Students may undertake only one appropriate level 5 or level 8 course from this program or another program in the Faculty of Engineering and Surveying as an Elective with the approval of the Head of Discipline.

## Surveying Major

To satisfy the requirements of the program students must complete all of the Academic and Practice courses in the following table that shows the recommended enrolment patterns for on-campus and external students for our Toowoomba campus. Students following a non-standard enrolment pattern should consult the [course synopses](#) section of this Handbook to ascertain if a course is offered in another term.

### Practice courses

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Safety boots are compulsory in engineering laboratories for several of the Practice courses and are strongly recommended for all other Practice courses.

### Elective courses

Elective courses are included in the list of Academic courses. Students should select these courses from the Electives table. Students may undertake only one appropriate level 5 or level 8 course from this program or another program in the Faculty of Engineering and Surveying as an Elective with the approval of the Head of Discipline.

## Surveying Major recommended enrolment pattern

Major study: Surveying (Major Study Code: 15408)									
Course	Year of program and semester in which course is normally studied						Residential school (compulsory /optional)	Enrolment requirements	
	On-campus (ONC)		External (EXT)		Online (WEB)				
	Year	Sem	Year	Sem	Year	Sem			
<b>Academic Courses</b>									
MAT1500 Engineering Mathematics 1	1	1	1	1					OE
GIS1401 Geographic Data Presentation	1	1	1	1					
SVY1102 Surveying A	1	1	2	1					
ENG1101 Engineering Problem Solving 1	1	1	2	1,2					
SVY1110 Introduction to Global Positioning System	1	2	1	2					
ENG1001 Principles of Professional Engineering and Surveying>	1	1,2	1	1,2					
SVY1104 Survey Computations A	1	2	2	2					Pre-requisite: SVY1102
CSC1401 Foundation Programming	1	2	2	1,2					
SVY2301 Automated Surveying Systems	2	1	3	1					Pre-requisite: SVY1104
SVY2106 Geodetic Surveying A	2	1	3	1					Pre-requisite: SVY1110
CIV2701 Road Design and Location	2	1	4	1					Pre-requisite: (ENG1100 or GIS1401) and (SVY1102 or SVY1101 or SVY1110)
MAT1502 Engineering Mathematics 2()	2	2	4	2					
ENG2102 Engineering Problem Solving 2	2	2	3	2					Pre-requisite: ENG1101
SVY2303 Construction Surveying	2	2	3	2					Pre-requisite: SVY2301
GIS1402 Geographic Information Systems	2	2	4	2					
SVY3304 Cadastral Surveying	2	2	4	2					Pre-requisite: SVY1102 and SVY1104
ENG2002 Technology and Society	3	1	5	1,3					
SVY3202 Photogrammetry and Remote Sensing	3	1	5	1					
SVY2302 Mine Surveying	3	1	6	1					Pre-requisite: SVY1104
ENV2201 Land Studies	3	1	6	1					
Elective	3	2	5	2					
SVY2105 Survey Computations B	3	2	5	2					Pre-requisite: SVY2106
SVY3201 Urban Design and Development	3	2	6	2					
SVY3107 Geodetic Surveying B+	3	2	6	2					Pre-requisite: SVY1110 OE
SVY4309 Practice Management for Spatial Scientists+	4	1	7	1					
ENG4111 Research Project Part 1^+	4	1	7	1					OE
SVY4203 Urban and Regional Planning	4	1	8	1					
Elective	4	1	8	1					
ACC1101 Accounting for Decision-Making>	4	2	7	1,2,3					OE
SVY4306 Land Law and Valuation^^			7	2					
Elective	4	2	8	2					
ENG4112 Research Project Part 2^++	4	2	8	2					Pre-requisite: ENG4111 OE
<b>Practice Courses</b>									
SVY1901 Surveying Practice 1	1	1	2	3			C		OE
SVY2902 Surveying Practice 2	2	1	3	3			C		Pre-requisite: SVY1901 OE
SVY2903	2	2	4	3			C		
SVY3904 ~			6	3			C		
ENG3902 %	3	2	7	2			C		
ENG4903 Professional Practice 2	4	1	8	2			C		Pre-requisite: ENG3902 OE

### Footnotes

- > The on-campus offering of this course has been timetabled for Semester 2. Students may consider the alternative semester however they may experience timetable clashes.

- () [MAT1102 Algebra and Calculus I](#) may be studied in Semester 1 as an alternate course to the Semester 2 offering of [MAT1502 Engineering Mathematics 2](#), in order to provide a balanced workload between semesters.
- + The semester 2 on-campus offering of this course has been cancelled for 2009.
- ^ It is recommended that these courses are undertaken in the same academic year.
- ^^ On-campus students should enrol in the external offering of this course.
- ++ It is recommended that students in the Bachelor of Spatial Science should also be enrolled in [ENG4903](#) while undertaking this course.
- ~ On-campus students should enrol in the external offering of this course.
- % Students must study [ENG3902](#) in their penultimate year.
- OE** Before enrolling in this course students must check that they have satisfied the 'Recommended prior study' or 'Other enrolment' requirements set out in the Other requisites section of the course specification.

**Notes:**

For students transferring from one program to another a complete list of enrolment requirements are available in the [course synopses](#) section of this Handbook.

## Surveying Major Elective courses

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	
<a href="#">CIS3001 Object-Oriented Programming with Java</a>		1		1			<b>OE</b>
<a href="#">CIV2605 Construction Engineering</a>		1		1			
<a href="#">REN1201 Environmental Studies</a>		1		1			
<a href="#">ENV1101 Hydraulics for Technologists</a>		1		1			<b>OE</b>
<a href="#">ENV2103 Hydraulics I</a>		1		1			<b>OE</b>
<a href="#">ENV4204 Environmental Technology</a>		1		1			
<a href="#">GIS3404 Geographic Data Visualisation+</a>		1		1			
<a href="#">MGT1000 Organisational Behaviour</a>		1		1,2,3			<b>OE</b>
<a href="#">CIV3703 Transport Engineering</a>		2		2			
<a href="#">ENV2102 Applied Hydrology+</a>		2		2			<b>OE</b>
<a href="#">CIV1501 Engineering Statics</a>		2		2,3			Pre-requisite: <a href="#">ENG1500</a> or <a href="#">MAT1500</a>
<a href="#">CIV2702 Municipal Services</a>		2		2			Pre-requisite: <a href="#">ENV1101</a>
<a href="#">GIS3405 Spatial Analysis and Modelling+</a>		2		2			<b>OE</b>
<a href="#">GIS3406 Remote Sensing and Image Processing+</a>		2		2			
<a href="#">GIS4407 Web Based Geographic Information System+</a>		2		2			Pre-requisite: <a href="#">GIS1402</a> or Students must be enrolled in one of the following Programs: GCGS or GDGS or MSST
<a href="#">LAW2107 Environmental Law</a>		2		2			<b>OE</b>
<a href="#">MAT2500 Engineering Mathematics 3</a>		2		2			Pre-requisite: <a href="#">MAT1102</a> or <a href="#">MAT1502</a> or Students must be enrolled in one of the following Programs: MSBI or GCEN or GDET or METC

**Footnotes**

- + The semester 1 on-campus offering of this course has been cancelled for 2009.
- OE** Before enrolling in this course students must check that they have satisfied the 'Recommended prior study' or 'Other enrolment' requirements set out in the Other requisites section of the course specification.

**Notes:**

Students may undertake only one appropriate level 5 or level 8 course from this program or another program in the Faculty of Engineering and Surveying as an Elective with the approval of the Head of Discipline.