

Bachelor of Engineering Technology (BETC) - BEngTech

CRICOS code (International applicants): 013504B

	On-campus	Distance education
Semester intake:	Semester 1 (March) Semester 2 (July)	Semester 1 (March) Semester 2 (July) Semester 3 (November)
Campus:	Springfield, Toowoomba	-
Fees:	Commonwealth supported place International full fee paying place	Commonwealth supported place International full fee paying place
Standard duration:	3 years full-time, 6 years part-time or external	
Program articulation:	From: Associate Degree in Engineering To: Bachelor of Engineering	

Notes:

Please note that the Civil Engineering major and the Infrastructure Management major (formerly known as Building and Construction Management) are the only two majors that are available on-campus at Springfield.

Contact us

Future Australian and New Zealand students	Future International students	Current students
Ask a question Freecall (within Australia): 1800 640 678 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 usqassist@usq.edu.au

Civil Engineering Major

This major provides students with the skills to plan, design, construct and maintain infrastructure, such as roads, railways, airfields, irrigation works, buildings, harbour facilities and disposal works. Students have the opportunity to specialise in the areas of project design and construction, and research and development.

Career opportunities

The building and development of infrastructure, such as roads, railways, airfields, irrigation works, buildings, harbour facilities, dams, pipelines, sewers, tunnels, canals and disposal works.

Computer Systems Engineering Major

Students learn to apply practical analysis and technical principles to the design and development of computer systems, including both hardware and software. Advanced studies are undertaken in management, computer systems and communications, programming, telecommunications, operating systems, real-time systems and electronic systems.

Career opportunities

Engineering applications of expert systems, hardware interfacing computer sales, computer engineering technologist, computer manufacturing, computer systems officers.

Electrical and Electronic Engineering Major

There are four interrelated areas within this major: Energy Systems and Power Electronics, in which students acquire a knowledge of generators, transformers, switch gear motors and power electronics; Computers and Microprocessors, in which students are introduced to computer architecture, hardware, software, programming and interfacing; Communications, in which students investigate developments in the transmission of information; and Control, which investigates signal processing in control and fault diagnosis.

Career opportunities

Analogue and digital electronics, computer engineering, microprocessors and applications, measurement, instrumentation and control, robotics, telecommunications, microwaves, fibre optics, biomedical engineering, power stations, distribution and machines, defence services, electricity boards, government departments.

Environmental Engineering Major

The Environmental Engineering major at USQ is unique. Other Environmental Engineering programs in Australia focus on either pollution control/toxic waste or public health/sanitary engineering. In contrast, Environmental Engineering at USQ emphasises the sustainable management of Australia's vital soil and water resources. It is a broad-ranging major, drawing on the University's expertise in agricultural engineering and land management. Environmental Engineering at USQ provides students with the knowledge and skills to be an 'environmental problem solver'. Students will learn to find workable, down-to-earth engineering solutions to environmental issues. Rural and resource engineering issues are a major focus of the program.

Career opportunities

Water and wastewater treatment, river hydrology, soil conservation, irrigation, salinisation, drainage, mine site rehabilitation, environmental studies, water resources engineering, soil science, engineering problem solving and management.

Infrastructure Management Major

(Formerly known as Building and Construction Management)

This program provides a sound knowledge of the principles and practice of building and construction as well as the management skills required to supervise projects of this type. Many supervisors in the building and construction industry have a trade background, and may be seeking an appropriate qualification that will enable them to work as engineering technologists as defined by Engineers Australia.

Career opportunities

Principles and practice of building and construction management, integrating project management, construction technology, problem solving, law, health and safety, finance and engineering sciences.

Mechanical Engineering Major

This major provides students with skills in energy generation, dynamic mechanisms, simulation, manufacturing and fluid flow control, to design new machines and devices and improve manufacturing systems.

Career opportunities

Manufacturing refineries, mining, transportation, computing, energy and education industries, including consultancy, research, project planning and management design, development, supervision and commissioning of new systems, computer-aided design and manufacture of consumer products, machines and equipment, specialist technical sales.

Power Engineering Major

The Power Engineering major at USQ is unique. Students develop skills specific to power systems, including aspects of electrical power generation, distribution and transmission, and study the operation of electrical equipment.

Professional accreditation

A graduate of this program is eligible to apply for graduate membership of Engineers Australia as an Engineering Technologist. After further professional development, a graduate member with a Bachelor of Engineering Technology may apply for chartered status as an Engineering Technologist and, when granted, may use the post-nominal TMIEAust CEngT.

Program aims

To equip graduates with the academic, personal, professional, and technical knowledge, skills and understanding required to commence practice as a Graduate Engineering Technologist in Australia or overseas within appropriate social, cultural, industrial and environmental contexts.

Program objectives

The objectives of the Bachelor of Engineering Technology program are:

- to enable students to acquire and demonstrate that they possess the specified graduate attributes and capabilities
- to enable students to acquire an appropriate level of technical competence in one of the following fields: Infrastructure Management; Civil Engineering; Computer Systems Engineering; Electrical and Electronic Engineering; Environmental Engineering; Mechanical Engineering or Power Engineering
- 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
- to ensure that graduates are eligible for the Engineering Technologist Graduate grade of membership with Engineers Australia, and for membership of other appropriate professional bodies.

Admission requirements

Applicants shall normally:

- have studied four semester units and achieved an exit assessment of 'Sound Achievement' or better in the Queensland Senior Secondary School subject: English and Mathematics B; 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 Engineering Technology program consists of core, major study and Elective components. Students enrolled in the Bachelor of Engineering Technology program may undertake a professional specialisation in one of seven major discipline areas:

- Civil Engineering
- Computer Systems Engineering
- Electrical and Electronic Engineering
- Environmental Engineering
- Infrastructure Management (formerly known as Building and Construction Management)
- Mechanical Engineering
- Power Engineering.

The Bachelor of Engineering Technology program comprises 24 academic and several practice units and involves three years of full-time study or six years of part-time study. The program is available in the on-campus mode and in the external mode of study. In order to be eligible for the award, students must complete the program within a maximum of five years of full-time study, or 10 years of part-time study, from the date of their initial enrolment.

The Elective component of the program allows students to select appropriate courses from engineering and other discipline areas that will enhance individual career prospects. The Elective courses listed in the following pages are not comprehensive and a Head or Program Coordinator may permit a student to enrol in an Elective course other than those specified for the accredited program. Such courses will normally be drawn from other accredited degree programs offered by the University, but may be courses developed by industry where these are deemed to be of a suitable academic standard. Note however that students who wish to enrol in courses other than those listed must obtain the written approval of the appropriate Head or Program Coordinator prior to enrolling in the course if they want the course to be credited towards their award.

The program structure for each of the major studies in the Bachelor of Engineering Technology is shown in the following pages.

Required time limits

Full-time students have a maximum of five years to complete this program. Part-time students have a maximum of 10 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.

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

Students who have completed an Associate Diploma or Associate Degree program in Engineering at a Queensland university within the last five years may be able to claim up to a maximum of 16 units of advanced standing in the Bachelor of Engineering Technology program if studying in the same discipline area. Students who have completed an Advanced Diploma program in engineering at a TAFE college within the last five years are eligible to claim up to a maximum of 12 units of advanced standing if studying in the same discipline area provided appropriate modules from the national curriculum have been completed. Students holding an Associate Diploma in Engineering who seek and gain significant advanced standing in the Bachelor of Engineering Technology program in the same field of study are not entitled to use both awards after graduation.

Students who have completed a Bachelor of Engineering Technology program, or equivalent, within the last five years may normally be able to claim up to a maximum of 20 units of advanced standing in the [Bachelor of Engineering](#). It is possible for students to be granted maximum credit (24 units) towards the [Bachelor of Engineering](#) but this ONLY applies to students who have applied for, and been granted, approval to undertake the 'Pathway to [Bachelor of Engineering](#)'. The amount of credit granted depends upon the field of study and Electives completed in the Bachelor of Engineering Technology program and the field of study selected in the Bachelor of Engineering.

Exit points

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

Other information

A special Pathway has been developed for students who intend to study the Bachelor of Engineering once they have completed the Bachelor of Engineering Technology program. Pathway to the [Bachelor of Engineering](#) maximises the advanced standing (exemptions) students will receive in the Bachelor of Engineering program. A Pathway to the [Bachelor of Engineering](#) has been developed for each of the following Bachelor of Engineering Technology majors into the equivalent Bachelor of Engineering major:

- Civil Engineering
- Computer Systems Engineering
- Electrical and Electronic Engineering
- Environmental Engineering
- Mechanical Engineering
- Power Engineering

Pathway to the [Bachelor of Engineering](#) has been specially developed for students who study part-time. Full-time students may seek approval to follow the Pathway to the [Bachelor of Engineering](#), but it is not timetabled for on-campus students.

Students must have the approval of their Head of Discipline to undertake the Pathway to the [Bachelor of Engineering](#). Students are strongly advised to consider and apply for approval for this Pathway as soon as possible in order to maximise the credit they will receive in the [Bachelor of Engineering](#). This should be done prior to the commencement of the second year of studies if possible.

Before applying for approval students must demonstrate they have the ability to undertake the Bachelor of Engineering program by successfully completing the course [MAT1502 Engineering Mathematics 2](#) as one of their Electives. The Head of Discipline will also consider a student's GPA before granting approval.

Once approval is granted, students following the Pathway to the [Bachelor of Engineering](#) will not study the courses marked with the # symbol in the Enrolment Pattern for their major. Instead, their Head of Discipline will advise them of the courses they should study when granting approval for them to follow the Pathway to the [Bachelor of Engineering](#).

Civil Engineering recommended enrolment pattern Major (Toowoomba and Springfield campuses)

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 both Toowoomba and Springfield campuses. 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.

Pathways

The Pathway to the Bachelor of Engineering program is available for this major. Please refer to '[Other Information - Pathway to the Bachelor of Engineering program](#)' at the beginning of this program section.

Civil Engineering Major recommended enrolment pattern (Toowoomba and Springfield campuses)

Major study: Civil Engineering (Major Study Code: 12044)								
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		
Academic Courses								
ENG1001 Principles of Professional Engineering and Surveying	1	1,2	1	1,2				
MAT1500 Engineering Mathematics 1**	1	1	1	1				OE
ENG1100 Introduction to Engineering Design	1	1,2	1	1,2				
CIV1501 Engineering Statics	1	2	1	2,3				Pre-requisite: ENG1500 or MAT1500
ENG1101 Engineering Problem Solving 1	1	1	2	1,2				
MEC1201 Engineering Materials	1	1,2	2	1,2				
ENG2102 Engineering Problem Solving 2	1	2	2	2				Pre-requisite: ENG1101
SVY1110 Introduction to Global Positioning System	1	2	2	2				
ENG2002 Technology and Society	2	1	3	1,3				
ENV1101 Hydraulics for Technologists	2	1	3	1				OE
CIV2401 Geomechanics	2	2	3	2				
CIV2502 Steel and Building Technology+	2	2	3	2				
CIV2701 Road Design and Location++++	2	1	4	1				Pre-requisite: (ENG1100 or GIS1401) and (SVY1102 or SVY1101 or SVY1110)
CIV2605 Construction Engineering	2	1	4	1				
CIV2702 Municipal Services#	2	2	4	2				Pre-requisite: ENV1101
CIV2601 Job Organisation+	2	2	4	2				
ENG3003 Engineering Management	3	1	5	1, 3				OE
MEC2402 Stress Analysis	3	1	5	1				Pre-requisite: CIV1501 or S tudents must be enrolled in one of the following Program s: GCEN or GDET or METC or MEPR
ENV2102 Applied Hydrology+&	3	2	5	2				OE
CIV2503 Structural Design I	3	2	5	2				Pre-requisite: ENG1100 and CIV1501
Elective#	3	1	6	1				
Elective#	3	1	6	1				
Elective#	3	2	6	2				
Elective#	3	2	6	2				
Practice Courses								
ENG1901 Engineering Practice 1 [^]	1	1,2	2	2,3			C	
SVY2905 +++	1	2	2	2,3			C	
ENV2901	2	2	3	2			C	
CIV3906 Civil Materials Practice	2	1	4	3			C	
CIV3907 [^]			6	3			C	

Footnotes

** Students with a mathematics background which is not to the standard of a Sound Achievement in Queensland Senior Mathematics B (or equivalent), will be required to undertake [ENG1500 Engineering Fundamentals](#) in lieu of [MAT1500 Engineering Mathematics 1](#), and will need to undertake [MAT1500 Engineering Mathematics 1](#) at a later stage of their program as one of their Elective courses. Please refer to the notes under the heading General faculty and program information 2009 <http://www.usq.edu.au/handbook/2009/eng/geninfo.html> General Information - Undergraduate Programs section of the Faculty's entry in this Handbook.

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

++++ The Semester 1 Springfield offering of this course has been cancelled for 2009.

- # This is a Pathway to the Bachelor of Engineering course. Please refer to 'Other Information - Pathway to the Bachelor of Engineering program' at the beginning of this program section.
- +& The semester 2 on-campus offerings (Toowoomba and Springfield campuses) of this course have been cancelled for 2009.
- ^^ Before enrolling in **ENG1901 Engineering Practice 1** is the first in a series of **Practice Courses** designed to enable students to acquire engineering and professional practice skills, including practical and teamwork skills, problem solving and engineering judgement. It is designed principally to cater for the needs of recent school leavers and those lacking any significant experience of the engineering workforce. **Students who have a trade certificate and who have been employed in the engineering industry for some time may be able to claim exemption from the course.**
- +++ The semester 2 on-campus Springfield offering of this course has been cancelled for 2009.
- ^ On-campus students should enrol in the external offering of this course.
- 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.

Civil Engineering Elective courses (Toowoomba and Springfield campuses)

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	
Any approved BEng (Civil) course							
or							
CIV3603 Construction Methods				2			
ENG4004 Engineering Management Science*		2,3		2,3			
ENV2201 Land Studies		1		1			
ENV4204 Environmental Technology		1		1			
GIS1402 Geographic Information Systems		2		2			
REN1201 Environmental Studies		1		1			
SVY1102 Surveying A		1		1			
SVY3201 Urban Design and Development		2		2			

Footnotes

* No offering in Semester 3 2009

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.

Computer Systems Engineering 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

Pathways

The Pathway to the Bachelor of Engineering program is available for this major. Please refer to '[Other Information - Pathway to the Bachelor of Engineering program](#)' at the beginning of this program section.

Computer Systems Engineering Major recommended enrolment pattern

Major study: Computer Systems Engineering (Major Study Code: 13274)								
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		
Academic Courses								
CSC1401 Foundation Programming	1	1,2	1	1,2				
ENG1101 Engineering Problem Solving 1	1	1	2	1,2				
MAT1500 Engineering Mathematics 1*	1	1	1	1				OE
ELE1301 Computer Engineering	1	1	2	1				
CSC2401 Algorithms and Data Structures	2	1,2	3	1,2				Pre-requisite: CSC1401 or USQIT16 or Students must be enrolled in one of the following Programs: MPIT or MSBN or MSMS
ENG2102 Engineering Problem Solving 2	1	2	2	2				Pre-requisite: ENG1101
ELE1502 Electronic Circuits	1	2	2	2				OE
ELE1801 Electrical Technology	1	2	1	2				Pre-requisite: ENG1500 or MAT1500
ENG1001 Principles of Professional Engineering and Surveying	1	1,2	1	1,2				
ENG2002 Technology and Society	2	1	4	1,3				
MAT1101 Discrete Mathematics for Computing	2	1	4	1				
ELE2303 Embedded Systems Design	2	1	3	1				OE
ELE2501 Electronic Workshop and Production+#	2	2	3	2				Pre-requisite: ELE1801 and ELE1502
Elective#	2	2	4	2				
ENG1100 Introduction to Engineering Design	2	1,2	4	1,2				
ELE2101 Control and Instrumentation+#	2	2	3	2				Pre-requisite: ENG1500 or MAT1500
CSC2402 Object-Oriented Programming in C++	3	1	6	1,2,3				Pre-requisite: CSC1401 or USQIT16 or Students must be enrolled in one of the following Programs: MPIT or GDGS or GCEN or GDET or METC
ELE3305 Computer Systems and Communications Protocols	3	1	6	1				OE
ENG3003 Engineering Management	3	1	5	1,3				OE
ELE2601 Telecommunications Principles	3	1	5	1				Pre-requisite: (ELE1502 and ELE1801) or Students must

Major study: Computer Systems Engineering (Major Study Code: 13274)								
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		
								be enrolled in one of the following Programs: GCEN or GDET or METC
Elective#	3	2	6	2				
CSC2404 Operating Systems	3	2	6	2				Pre-requisite: CSC1401 or USQIT16 or Students must be enrolled in the following Program: MPIT
ELE2503 Electronic Systems+##	3	2	5	2				Pre-requisite: ELE1502
ELE3307 Real Time Systems	3	2	5	2				Pre-requisite: ELE1301 or Students must be enrolled in one of the following Programs: GCEN or GDET or METC OE
Practice Courses								
ENG1901 Engineering Practice 1^	1	1	1	2,3			C	
ELE1911 Electrical and Electronic Practice A	1	1	2	3			C	OE
ELE2912 Electrical and Electronic Practice B	2	1	3	3			C	OE
ELE3913 Computer Systems Engineering Practice	3	1	5	2			C	OE
ELE3916 #			6	2			C	

Footnotes

- * Students with a mathematics background which is not to the standard of a Sound Achievement in Queensland Senior Mathematics B (or equivalent), will be required to undertake [ENG1500 Engineering Fundamentals](#) in lieu of [MAT1500 Engineering Mathematics 1](#), and will need to undertake [MAT1500 Engineering Mathematics 1](#) at a later stage of their program as one of their Elective courses. Please refer to the notes under the heading General faculty and program information 2009 <http://www.usq.edu.au/handbook/2009/eng/geninfo.html> General Information - Undergraduate Programs section of the Faculty's entry in this Handbook.
- + The semester 2 on-campus Toowoomba offering of this course has been cancelled for 2009.
- # This is a Pathway to the Bachelor of Engineering course. Please refer to 'Other Information - Pathway to the Bachelor of Engineering program' at the beginning of this program section.
- ^ Before enrolling in [ENG1901 Engineering Practice 1](#) is the first in a series of **Practice Courses** designed to enable students to acquire engineering and professional practice skills, including practical and teamwork skills, problem solving and engineering judgement. It is designed principally to cater for the needs of recent school leavers and those lacking any significant experience of the engineering workforce. **Students who have a trade certificate and who have been employed in the engineering industry for some time may be able to claim exemption from the course.**
- 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.

Computer Systems Engineering 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	
MAT1502 Engineering Mathematics 2		2		2			
ELE2103 Linear Systems and Control		2		2			OE
ENG4004 Engineering Management Science^		2		2,3			
CSC2408 Software Development Tools		2,		2,3			OE

Footnotes

- ^ Not offered in Semester 3 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.

With approval from their Program Coordinator, students may also enrol in courses from other engineering programs or the Faculties of Sciences or Business.

A maximum of one unit may be selected from other Faculties.

On entering the Bachelor of Engineering Technology in Computer Systems Engineering, external students are required to purchase a kit of tools comprising an electronic soldering iron, wire strippers, long nose pliers, diagonal cutter, safety glasses and an electronic prototyping 'breadboard'. These will first be required for [ELE2501 Electronic Workshop and Production](#) and [ELE1502 Electronic Circuits](#), and further details will be provided on commencement of these courses. Additionally, all students enrolled in course [ELE2501](#) will be required to purchase an electronic kit costing approximately \$50.

Students who have been granted an exemption in the course [ELE1801 Electrical Technology](#) are strongly advised to purchase the [ELE1801](#) study materials from the USQ Bookshop and work through these to consolidate their knowledge.

Students should also refer to the [Other Requirements for Students Studying Electrical and Electronic, Computer Systems or Power Engineering Courses](#) at the beginning of the Faculty of Engineering and Surveying section of this Handbook.

Electrical and Electronic Engineering 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 both Toowoomba and Springfield campuses. 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

Pathways

The Pathway to the Bachelor of Engineering program is available for this major. Please refer to '[Other Information - Pathway to the Bachelor of Engineering program](#)' at the beginning of this program section.

Electrical and Electronic Engineering Major recommended enrolment pattern

Major study: Electrical and Electronic Engineering (Major Study Code: 12047)								
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		
Academic Courses								
MEC1201 Engineering Materials	1	1,2	1	1,2				

Major study: Electrical and Electronic Engineering (Major Study Code: 12047)								
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		
ENG1101 Engineering Problem Solving 1	1	1	2	1,2				
MAT1500 Engineering Mathematics 1*	1	1	1	1				OE
ELE1301 Computer Engineering	1	1	2	1				
ENG1001 Principles of Professional Engineering and Surveying	1	1,2	1	1,2				
ENG2102 Engineering Problem Solving 2	1	2	2	2				Pre-requisite: ENG1101
ELE1502 Electronic Circuits	1	2	2	2				OE
ELE1801 Electrical Technology	1	2	1	2				Pre-requisite: ENG1500 or MAT1500
ENG1100 Introduction to Engineering Design	2	1,2	3	1,2				
ELE2702 Electrical Measurement and Analysis++#	2	1	4	1				Pre-requisite: (ENG1500 or MAT1500) and ELE1801
ELE2601 Telecommunications Principles	2	1	4	1				Pre-requisite: (ELE1502 and ELE1801) or Students must be enrolled in one of the following Programs: GCEN or GDET or METC
ELE2303 Embedded Systems Design	2	1	3	1				OE
ELE2501 Electronic Workshop and Production++#	2	2	3	2				Pre-requisite: ELE1801 and ELE1502
Elective#	2	2	4	2				
ELE2503 Electronic Systems+#	2	2	4	2				Pre-requisite: ELE1502
ELE2101 Control and Instrumentation+#	2	2	3	2				Pre-requisite: ENG1500 or MAT1500
ENG3003 Engineering Management	3	1	6	1,3				OE
ENG2002 Technology and Society	3	1	5	1,3				
Elective#	3	1	6	1				
ELE3803 Electrical Plant	3	1	5	1				Pre-requisite: ELE1801 or Students must be enrolled in one of the following Programs: GCEN or GDET or METC or MEPR OE
Elective#	3	2	6	2				
Elective#	3	2	6	2				
ELE3506 Electronic Measurement	3	2	5	2				Pre-requisite: (ELE1502 and (ELE2101 or ELE2103) and (ELE2503 or ELE2504)) or Students must be enrolled in one of the following Programs: GCEN or GDET or METC or MEPR
ELE3805 Power Electronics Principles and Applications	3	2	5	2				Pre-requisite: (ELE1502 and ELE1801) or Students must be enrolled in one of the following Programs: GCEN or GDET or METC or MEPR
Practice Courses								
ENG1901 Engineering Practice 1^	1	1,2	1	2,3				C
ELE1911 Electrical and Electronic Practice A	1	1	2	3				C OE
ELE2912 Electrical and Electronic Practice B	2	1	3	3				C OE
ELE2913 Electrical and Electronic Practice C	2	1	4	2				C OE
ELE3914 Electrical and Electronic Practice D	3	1	5	2				C OE

Footnotes

- * Students with a mathematics background which is not to the standard of a Sound Achievement in Queensland Senior Mathematics B (or equivalent), will be required to undertake [ENG1500 Engineering Fundamentals](#) in lieu of [MAT1500 Engineering Mathematics 1](#), and will need to undertake [MAT1500 Engineering Mathematics 1](#) at a later stage of their program as one of their Elective courses. Please refer to the notes under the heading General faculty and program information 2009 <http://www.usq.edu.au/handbook/2009/eng/geninfo.html> General Information - Undergraduate Programs section of the Faculty's entry in this Handbook.
- ++ The semester 1 on-campus Toowoomba offering of this course has been cancelled for 2009.
- # This is a Pathway to the Bachelor of Engineering course. Please refer to 'Other Information - Pathway to the Bachelor of Engineering program' at the beginning of this program section.
- + The semester 2 on-campus Toowoomba offering of this course has been cancelled for 2009.
- ^ Before enrolling in [ENG1901 Engineering Practice 1](#) is the first in a series of **Practice Courses** designed to enable students to acquire engineering and professional practice skills, including practical and teamwork skills, problem solving and engineering judgement. It is designed principally to cater for the needs of recent school leavers and those lacking any significant experience of the engineering workforce. **Students who have a trade certificate and who have been employed in the engineering industry for some time may be able to claim exemption from the course.**
- 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.

Electrical and Electronic Engineering 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	
ELE2704 Electricity Supply Systems+		2		2			OE
MAT1502 Engineering Mathematics 2		2		2			
ELE2103 Linear Systems and Control		2		2			OE
ELE2504 Electronic Design and Analysis		2		2			Pre-requisite: ELE1502 or Students must be enrolled in the following Program: MEPR OE
ENG4004 Engineering Management Science*		2		2,3			
ELE3305 Computer Systems and Communications Protocols		1		1			OE
ELE4109 Measurement Science and Instrument Engineering				1			Pre-requisite: ELE3506

Footnotes

- + The semester 2 on-campus Toowoomba offering of this course has been cancelled for 2009.
- * No offering in Semester 3 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 wishing to further their knowledge of software may be allowed to choose one Elective from courses offered by the Faculty of Sciences. Interested students should peruse the [course synopses](#) to see what is available and then contact their Program Coordinator responsible for the program.

A maximum of one unit may be selected from other Faculties.

On entering the Bachelor of Engineering Technology in Electrical and Electronic Engineering external students are required to purchase a kit of tools comprising an electronic soldering iron, wire strippers, long nose pliers, diagonal cutter, safety glasses and an electronic prototyping 'breadboard'. These will first be required for [ELE2501 Electronic Workshop and Production](#) and [ELE1502 Electronic Circuits](#), and further details will be provided on commencement of these courses. Additionally, all students enrolled in course [ELE2501](#) will be required to purchase an electronic kit costing approximately \$50. For [ELE2702](#), access to an analogue multimeter and hook-up wire may be required, together with the purchase of some electronic components.

Students who have been granted an exemption in the course [ELE1801 Electrical Technology](#) are strongly advised to purchase the [ELE1801](#) study materials from the [USQ Bookshop](#) and work through these prior to attempting [ELE2702](#) or [ELE3803](#).

Students should also refer to the [Other Requirements for Students Studying Electrical and Electronic or Computer Systems Courses](#) at the beginning of the Faculty of Engineering and Surveying section of this Handbook.

Environmental Engineering 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

Pathways

The Pathway to the Bachelor of Engineering program is available for this major. Please refer to '[Other Information - Pathway to the Bachelor of Engineering program](#)' at the beginning of this program section.

Environmental Engineering Major recommended enrolment pattern

Major study: Environmental Engineering (Major Study Code: 12045)									
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			
Academic Courses									
ENG1001 Principles of Professional Engineering and Surveying	1	1,2	1	1,2					
MAT1500 Engineering Mathematics 1*	1	1	1	1					OE
ENG1100 Introduction to Engineering Design	1	1,2	1	1,2					
CIV1501 Engineering Statics	1	2	1	2,3					Pre-requisite: ENG1500 or MAT1500
ENG1101 Engineering Problem Solving 1	1	1	2	1,2					
MEC1201 Engineering Materials	1	1,2	2	1,2					
ENG2102 Engineering Problem Solving 2	1	2	2	2					Pre-requisite: ENG1101
SVY1110 Introduction to Global Positioning System	1	2	1	2					
ENG2002 Technology and Society	2	1	3	1,3					
REN1201 Environmental Studies	2	1	3	1					
CIV2401 Geomechanics	2	2	3	2					
ENV2102 Applied Hydrology+#	2	2	3	2					OE
ENV1101 Hydraulics for Technologists#	2	1	4	1					OE
ENV2201 Land Studies	2	1	4	1					
AGR2301 Agricultural Science	2	2	4	2					
Elective#	2	2	4	2					

Major study: Environmental Engineering (Major Study Code: 12045)								
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		
ENG3003 Engineering Management	3	1	5	1,3				OE
ENV4204 Environmental Technology	3	1	5	1				
Elective#	3	2	5	2				
ENV4203 Public Health Engineering	3	2	5	2				Pre-requisite: ENV1101 or ENV2103 or Students must be enrolled in one of the following Programs: GCEN or GDET or METC or MEPR
AGR3304 Soil Science	3	1	6	1				
Elective#	3	1	6	1				
ENV4106 Irrigation Science+	3	2	6	2				Pre-requisite: AGR3304 or Students must be enrolled in one of the following Programs: GCEN or GDET or METC or MEPR
GIS1402 Geographic Information Systems	3	2	6	2				
Practice Courses								
ENG1901 Engineering Practice 1[^]	1	1,2	1	2,3			C	
SVY2905	1	2	2	2,3			C	
ENV2901	2	2	4	2			C	
AGR2902 ^{^^}			4	3			C	
AGR3903 ^{^^^}			5	2			C	
ENV3904 ^{^^^}			6	3			C	

Footnotes

- * Students with a mathematics background which is not to the standard of a Sound Achievement in Queensland Senior Mathematics B (or equivalent), will be required to undertake [ENG1500 Engineering Fundamentals](#) in lieu of [MAT1500 Engineering Mathematics 1](#), and will need to undertake [MAT1500 Engineering Mathematics 1](#) at a later stage of their program as one of their Elective courses. Please refer to the notes under the heading General faculty and program information 2009 <http://www.usq.edu.au/handbook/2009/eng/geninfo.html> General Information - Undergraduate Programs section of the Faculty's entry in this Handbook.
- + The semester 2 on-campus Toowoomba offering of this course has been cancelled for 2009.
- # This is a Pathway to the Bachelor of Engineering course. Please refer to 'Other Information - Pathway to the Bachelor of Engineering program' at the beginning of this program section.
- [^] Before enrolling in [ENG1901 Engineering Practice 1](#) is the first in a series of **Practice Courses** designed to enable students to acquire engineering and professional practice skills, including practical and teamwork skills, problem solving and engineering judgement. It is designed principally to cater for the needs of recent school leavers and those lacking any significant experience of the engineering workforce. **Students who have a trade certificate and who have been employed in the engineering industry for some time may be able to claim exemption from the course.**
- ^{^^} AGR2902 may involve overnight field trips for which each student will be responsible for their own accommodation costs. The course is not offered in the on-campus mode. On-campus students should enrol in the external mode of this course.
- ^{^^^} and ENV3904 are not offered in the on-campus mode. On-campus students should enrol in the external mode of these courses.
- 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.

Environmental Engineering 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	
Any approved BEng (Env) course							
or							
BIO2208		1					
CHE1110 Chemistry 1		1		1			
CIV3703 Transport Engineering		2		2			
CMS3010 Environmental Discourses: Democracy, Science & Economics		2		2			
ENG4004 Engineering Management Science*		2,3		2,3			
GIS2403 Land Management Systems		2		2			
LAW2107 Environmental Law		2		2			OE
SVY1102 Surveying A		1		1			
SVY3201 Urban Design and Development		2		2			
SVY3202 Photogrammetry and Remote Sensing		1		1			

Footnotes

* No offering in Semester 3 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.

Infrastructure Management Major (Toowoomba and Springfield campuses)

(Formerly known as Building and Construction Management) 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 both Toowoomba and Springfield campuses. 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

Infrastructure Management Major recommended enrolment pattern - (Toowoomba and Springfield campuses)

Major study: Infrastructure Management (Major Study Code: 12046)								
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		
Academic Courses								
ENG1001 Principles of Professional Engineering and Surveying	1	1,2	1	1,2				
MAT1500 Engineering Mathematics 1*	1	1	1	1				OE
ENG1100 Introduction to Engineering Design	1	1,2	1	1,2				
CIV1501 Engineering Statics	1	2	1	2,3				Pre-requisite: ENG1500 or MAT1500
ENG1101 Engineering Problem Solving 1	1	1	2	1,2				
MEC1201 Engineering Materials	1	1,2	2	1,2				
ENG2102 Engineering Problem Solving 2	1	2	2	2				Pre-requisite: ENG1101
SVY1110 Introduction to Global Positioning System	1	2	2	2				
ENG2002 Technology and Society	2	1	3	1,3				
MGT3100 Quality and Performance Management	1		3	1				Pre-requisite: STA2300 OE
ACC1101 Accounting for Decision-Making	2	2	3	1,2,3				OE
CIV2502 Steel and Building Technology+	2	2	3	2				
MGT1001 Human Resource Management	2	1	4	1				OE
MGT1000 Organisational Behaviour	2	1	4	1,2,3				OE
CIV2401 Geomechanics	2	2	4	2				
CIV2503 Structural Design I	2	2	4	2				Pre-requisite: ENG1100 and CIV1501
ENG3003 Engineering Management	3	1	5	1				OE
CIV2605 Construction Engineering	3	1	5	1				
CIV3603 Construction Methods			5	2				
ENG4004 Engineering Management Science	3	2	5	2				
Elective	3	1	6	1				
MGT2001 Management of Workplace Health and Safety	3	1	6	1				OE
LAW1101 Introduction to Law	3	2	6	1,2				OE
CIV2601 Job Organisation+	3	2	6	2				
Practice Courses								
ENG1901 Engineering Practice 1 [^]	1	1,2	2	2,3			C	
SVY2905	2	2	2	2,3			C	
ENV2901	2	2	3	2			C	
CIV3906 Civil Materials Practice	3	1	5	3			C	

Footnotes

* Students with a mathematics background which is not to the standard of a Sound Achievement in Queensland Senior Mathematics B (or equivalent), will be required to undertake [ENG1500 Engineering Fundamentals](#) in lieu of [MAT1500 Engineering Mathematics 1](#), and will need to undertake [MAT1500 Engineering Mathematics 1](#) at a later stage of their program as one of their Elective courses. Please refer to the notes under the heading General faculty and program information 2009 <http://www.usq.edu.au/handbook/2009/eng/geninfo.html> General Information - Undergraduate Programs section of the Faculty's entry in this Handbook.

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

[^] Before enrolling in [ENG1901 Engineering Practice 1](#) is the first in a series of **Practice Courses** designed to enable students to acquire engineering and professional practice skills, including practical and teamwork skills, problem solving and engineering judgement. It is designed principally to cater for the needs of recent school leavers and those lacking any significant experience of the engineering workforce. **Students who have a trade certificate and who have been employed in the engineering industry for some time may be able to claim exemption from the course.**

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 contemplating undertaking the [Bachelor of Engineering](#) after completing the Bachelor of Engineering Technology should consider taking Bachelor of Engineering courses as their Elective courses.

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

Infrastructure Management Major Elective courses

(Formerly known as Building and Construction Management)

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	
Any approved BEng (Civil) course							
or							
CIV3506 Concrete Structures		1		1			Pre-requisite: CIV2503 or Students must be enrolled in one of the following Programs: GCEN or GDET or METC or MEPR OE
ENV2201 Land Studies		1		1			
SVY4203 Urban and Regional Planning		1		1			

Footnotes

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.

Mechanical Engineering 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 campuses. 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

Pathways

The Pathway to the Bachelor of Engineering program is available for this major. Please refer to '[Other Information - Pathway to the Bachelor of Engineering program](#)' at the beginning of this program section.

Mechanical Engineering Major recommended enrolment pattern

Major study: Mechanical Engineering (Major Study Code: 12048)								
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		
Academic Courses								
ENG1001 Principles of Professional Engineering and Surveying	1	1,2	1	1,2				
ENG1101 Engineering Problem Solving 1	1	1	1	1,2				
MEC1201 Engineering Materials	1	1,2	1	1,2				
ENG2102 Engineering Problem Solving 2	1	2	1	2				Pre-requisite: ENG1101
MAT1500 Engineering Mathematics 1*	1	1	2	1				OE
ENG1100 Introduction to Engineering Design	1	1,2	2	1,2				
CIV1501 Engineering Statics	1	2	2	2,3				Pre-requisite: ENG1500 or MAT1500
MEC2304 Solid Modelling	1	2	2	2				OE
MEC2101 Thermodynamics	2	1	3	1				
MEC2202 Manufacturing Processes	2	1	3	1				Pre-requisite: MEC1201
MEC2106 Introduction to Fluid Mechanics and Heat Transfer+#	2	2	3	2				Pre-requisite: MAT1500 and CIV1501
ELE1801 Electrical Technology	2	2	3	2				Pre-requisite: ENG1500 or MAT1500
MEC2402 Stress Analysis	2	1	4	1				Pre-requisite: CIV1501 or S tudents must be enrolled in one of the following Program s: GCEN or GDET or METC or MEPR
MEC2405 Machine Dynamics#	2	1	4	1				Pre-requisite: CIV1501
MEC2301 Design of Machine Elements	2	2	4	2				Pre-requisite: MEC2402 OE
Elective#	2	2	4	2				
ENG2002 Technology and Society	3	1	5	1,3				
ENG3003 Engineering Management	3	1	5	1,3				OE
Elective#	3	2	5	2				
MEC3303 System Design	3	2	5	2				Pre-requisite: MEC2301 or Students must be enrolled in one of the following Program s: GCEN or GDET or METC
MEC3203 Materials Technology	3	1	6	1				Pre-requisite: MEC1201 or Students must be enrolled in one of the following Program s: GCEN or GDET or METC
MEC4104 Energy Technology#	3	1	6	1				Pre-requisite: (MEC2101 and MEC3102) or MEC2106 or Students must be enrolled in one of the following Program s: GCEN or GDET or METC
ENG4004 Engineering Management Science*	3	2	6	2,3				
MEC3204 Production Engineering	3	2	6	2				OE
Practice Courses								
ENG1901 Engineering Practice 1^	1	1,2	2	2,3			C	

Major study: Mechanical Engineering (Major Study Code: 12048)								
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		
MEC2901 Mechanical Practice 1	1	1	3	3			C	
MEC2902 Mechanical Practice 2	2	1	4	2			C	
MEC3903	2	2	4	2			C	
MEC3904	3	2	6	2			C	

Footnotes

- * Students with a mathematics background which is not to the standard of a Sound Achievement in Queensland Senior Mathematics B (or equivalent), will be required to undertake [ENG1500 Engineering Fundamentals](#) in lieu of [MAT1500 Engineering Mathematics 1](#), and will need to undertake [MAT1500 Engineering Mathematics 1](#) at a later stage of their program as one of their Elective courses. Please refer to the notes under the heading General faculty and program information 2009 <http://www.usq.edu.au/handbook/2009/eng/geninfo.html> General Information - Undergraduate Programs section of the Faculty's entry in this Handbook.
- + The semester 2 Toowoomba on-campus offering of this course has been cancelled for 2009.
- # This is a Pathway to the Bachelor of Engineering course. Please refer to 'Other Information - Pathway to the Bachelor of Engineering program' at the beginning of this program section.
- ^ Before enrolling in [ENG1901 Engineering Practice 1](#) is the first in a series of **Practice Courses** designed to enable students to acquire engineering and professional practice skills, including practical and teamwork skills, problem solving and engineering judgement. It is designed principally to cater for the needs of recent school leavers and those lacking any significant experience of the engineering workforce. **Students who have a trade certificate and who have been employed in the engineering industry for some time may be able to claim exemption from the course.**
- 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.

Mechanical Engineering 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	
CIV2502 Steel and Building Technology+		2		2			
MAT1502 Engineering Mathematics 2		2		2			
ELE1502 Electronic Circuits		2		2			OE
ELE1301 Computer Engineering		1		1			
ELE3803 Electrical Plant		1		1			Pre-requisite: ELE1801 or Students must be enrolled in one of the following Programs: GCEN or GDET or METC or MEPR OE
CIV2503 Structural Design I		2		2			Pre-requisite: ENG1100 and CIV1501
ENV4204 Environmental Technology		1		1			
A maximum of one course may be selected from the following five:							
LAW1101 Introduction to Law		1,2		1,2			OE
ECO1000 Economics		1		1,2,3			OE
ACC1101 Accounting for Decision-Making		1,2		1,2,3			OE
MGT3100 Quality and Performance Management		1		1			Pre-requisite: STA2300 OE
MKT1001 Introduction to Marketing		1		1,2,3			OE

Footnotes

- + The semester 2 on-campus Toowoomba 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.

Power Engineering 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.

Pathway

The Pathway to the Bachelor of Engineering program is available for this major. Please refer to '[Other Information - Pathway to the Bachelor of Engineering program](#)' at the beginning of this program section.

Power Engineering Major recommended enrolment pattern

Major study: Power Engineering (Major Study Code:15935)								
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		
Academic Courses								
MEC1201 Engineering Materials	1	1,2	1	1,2				
ENG1101 Engineering Problem Solving 1	1	1	2	1,2				
MAT1500 Engineering Mathematics 1*	1	1	2	1				OE
ELE1301 Computer Engineering	1	1	2	1				
ENG1001 Principles of Professional Engineering and Surveying	1	1,2	1	1,2				
ENG2102 Engineering Problem Solving 2	1	2	2	2				Pre-requisite: ENG1101
ELE1502 Electronic Circuits	1	2	2	2				OE
ELE1801 Electrical Technology	1	2	1	2				Pre-requisite: ENG1500 or MAT1500
ENG1100 Introduction to Engineering Design	2	1,2	3	1,2				
ELE2702 Electrical Measurement and Analysis+++	2	1	4	1				Pre-requisite: (ENG1500 or MAT1500) and ELE1801
Elective	2	1	4	1				

Major study: Power Engineering (Major Study Code:15935)								
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		
ELE2303 Embedded Systems Design	2	1	3	1				OE
ELE2501 Electronic Workshop and Production++	2	2	3	2				Pre-requisite: ELE1801 and ELE1502
ELE2704 Electricity Supply Systems+		2	4	2				OE
ELE2503 Electronic Systems+#	2	2	4	2				Pre-requisite: ELE1502
ELE2101 Control and Instrumentation+#	2	2	3	2				Pre-requisite: ENG1500 or MAT1500
ENG3003 Engineering Management	3	1	6	1,3				OE
ENG2002 Technology and Society	3	1	5	1,3				
Elective	3	1	6	1				
ELE3803 Electrical Plant	3	1	5	1				Pre-requisite: ELE1801 or S students must be enrolled in one of the following Programs: GCEN or GDET or METC or MEPR OE
Elective	3	2	6	2				
Elective	3	2	6	2				
Elective	3	2	5	2				
ELE3805 Power Electronics Principles and Applications	3	2	5	2				Pre-requisite: (ELE1502 and ELE1801) or Students must be enrolled in one of the following Programs: GCEN or GDET or METC or MEPR
Practice Courses								
ENG1901 Engineering Practice 1 [^]	1	1,2	1	2, 3			C	
ELE1911 Electrical and Electronic Practice A	1	1	2	3			C	OE
ELE2912 Electrical and Electronic Practice B	2	1	3	3			C	OE
ELE2913 Electrical and Electronic Practice C	2	1	4	2			C	OE
ELE3914 Electrical and Electronic Practice D	3	1	5	2			C	OE

Footnotes

- * Students with a mathematics background which is not to the standard of a Sound Achievement in Queensland Senior Mathematics B (or equivalent), will be required to undertake **ENG1500 Engineering Fundamentals** in lieu of **MAT1500 Engineering Mathematics 1**, and will need to undertake **MAT1500 Engineering Mathematics 1** at a later stage of their program as one of their Elective courses. Please refer to the notes under the heading General faculty and program information 2009 <http://www.usq.edu.au/handbook/2009/eng/geninfo.html> General Information - Undergraduate Programs section of the Faculty's entry in this Handbook.
- ++ The semester 1 on-campus offering of this course has been cancelled for 2009.
- # This is a Pathway to the Bachelor of Engineering course. Please refer to other Information — Pathway to the **Bachelor of Engineering** program.
- + The semester 2 on-campus Toowoomba offering of this course has been cancelled for 2009.
- [^] Before enrolling in **ENG1901 Engineering Practice 1** is the first in a series of **Practice Courses** designed to enable students to acquire engineering and professional practice skills, including practical and teamwork skills, problem solving and engineering judgement. It is designed principally to cater for the needs of recent school leavers and those lacking any significant experience of the engineering workforce. **Students who have a trade certificate and who have been employed in the engineering industry for some time may be able to claim exemption from the course.**
- 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.

Power Engineering 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	
MAT1502 Engineering Mathematics 2		2		2			
ELE2103 Linear Systems and Control		2		2			OE
ELE2504 Electronic Design and Analysis		2		2			Pre-requisite: ELE1502 or Students must be enrolled in the following Program: MEPR OE
ENG4004 Engineering Management Science*		2		2,3			
ELE3305 Computer Systems and Communications Protocols		1		1			OE
ELE4109 Measurement Science and Instrument Engineering				1			Pre-requisite: ELE3506
CIV1501 Engineering Statics		2		2,3			Pre-requisite: ENG1500 or MAT1500
CIV2605 Construction Engineering		1		1			
CIV2401 Geomechanics		2		2			
GIS1401 Geographic Data Presentation		1		1			
GIS1402 Geographic Information Systems		2		2			
GIS2403 Land Management Systems		2		2			
SVY11110 Introduction to Global Positioning System		2		2			

Footnotes

* No offering in Semester 3 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 wishing to further their knowledge of software may be allowed to choose one Elective from courses offered by the Faculty of Sciences. Interested students should peruse the [course synopses](#) to see what is available and then contact their Program Coordinator responsible for the program. A maximum of one unit may be selected from other Faculties.

On entering the Bachelor of Engineering Technology in Power Engineering external students are required to purchase a kit of tools comprising an electronic soldering iron, wire strippers, long nose pliers, diagonal cutter, safety glasses and an electronic prototyping 'breadboard'. These will first be required for [ELE2501 Electronic Workshop and Production](#) and [ELE1502 Electronic Circuits](#), and further details will be provided on commencement of these courses. Additionally, all students enrolled in course [ELE2501](#) will be required to purchase an electronic kit costing approximately \$50. For [ELE2702](#), access to an analogue multimeter and hook-up wire may be required, together with the purchase of some electronic components.

Students who have been granted an exemption in the course [ELE1801 Electrical Technology](#) are strongly advised to purchase the [ELE1801](#) study materials from the [USQ Bookshop](#) and work through these prior to attempting [ELE2702](#) or [ELE3803](#).

Students should also refer to the [Other Requirements for Students Studying Electrical and Electronic, Computer Systems or Power Engineering Courses](#) at the beginning of the Faculty of Engineering and Surveying section of this Handbook.