355AA Bachelor of Engineering

Year and Campus:	2010 - Parkville
Fees Information:	Subject EFTSL, Level, Discipline & Census Date, http://enrolment.unimelb.edu.au/fees
Level:	Undergraduate
Duration & Credit Points:	400 credit points taken over 48 months full time. This course is available as full or part time.
Coordinator:	Professor Jamie Evans
Contact:	Eastern Precinct Student Centre **epsc-contact@unimelb.edu.au (mailto:epsc-contact@unimelb.edu.au)** **http://www.studentcentre.unimelb.edu.au/eastern (http://www.studentcentre.unimelb.edu.au/eastern)**
Course Overview:	**THIS COURSE IS FOR THOSE STUDENTS COMMENCING 2008 AND BEYOND.** The Bachelor of Engineering is a four-year full time program, which caters to students who wish to obtain an accredited engineering degree (400 points, 100 points of credit earned each year). To satisfy course requirements students must take the set of core engineering subjects prescribed for the branch of engineering being studied. This program is for those students commencing in 2008 and beyond (compared to the pre-2008 program) and offers enhanced flexibility and breadth opportunities, and allows a common first year with the Engineering Systems majors in the Bachelor of Science and maintains alternative pathways between Engineering and Science (for example Electrical or Mechanical Engineering and Physics, and Software Engineering and Mathematics or Computer Science) for up to two full years. Students commencing in 2008 and beyond study two breadth subjects in first year followed by another one or two (depending upon the stream chosen) breadth subjects in second year. Students are required to compile a reflective e-portfolio that is commenced in their first year of study as part of Engineering Systems Design 1. All engineering-related experiences, including those that arise during formal study, those that arise during optional vacation or term-time employment, those that arise during holidays or study abroad or exchange visits to other countries, those that arise via engagement in Knowledge Transfer or volunteer activities, and those that arise from discussions with fellow students, can be recorded and collated into a final form that will be inspected prior to the completion of their degree. This e-portfolio documents the attainment of professional competencies. Students will make use of the Engineering Learning Centre, which provides out-of-class study and meeting spaces for students. Students will be able to access on-line information such as the Learning Management System (LMS), study on their own and meet and collaborate with other students on project work and classwork, within a comfortable and supportive environment. Specialised learning spaces have been developed for students to participate in problem-based learning opportunities, commencing in first year with Engineering Systems Design 1 and 2, common subjects for all Bachelor of Engineering streams. Students studying engineering programs will be supported by Engineering Student Services which provides coordinated, seamless, flexible, comprehensive and equitable student-centric administrative services. The Engineering Student Centre supports a sense of belonging and connectedness of students to the Engineering discipline. Service standards are monitored to ensure a consistent, high-quality service. The range of services provided includes transactional services (e.g: graduation enquiries and course transactions), enrichment services (e.g: personal course advice, careers advice, language and learning skills programs and individual tutorials) and referrals to wellbeing services.
Objectives:	On completion of this course graduates should: # Have a sound fundamental understanding of the scientific principles underlying technology; # Have acquired the educational and professional standards of the professional institutions with which the School's courses are accredited # Possess a broad knowledge base of their chosen discipline and of other disciplines to facilitate effective communication with those other professionals with whom engineers routinely communicate;

- Be able to apply the basic principles underlying the management of physical, human and financial resources;
- Have acquired the mathematical and computational skills necessary for the solution of theoretical and practical problems;
- Possess analytical, problem-solving and design skills, including those appropriate for sustainable development;
- Have verbal and written communication skills that enable them to contribute substantially to society;
- Have acquired lifelong learning skills for further development professionally and for meeting future changes in technology;
- Have acquired a sense of professional ethics and responsibility towards the profession and the community;
- Have developed the interpersonal and management skills required by engineers in undertaking professional activities; and
- Be able to enact the social, cultural, global and environmental responsibilities of the professional engineer, and the need for sustainable development.

Course Structure & Available Subjects:

The recommended or standard course structures are listed below.

Subject Options:

First Year

Note: Students who have successfully completed VCE Specialist Maths should enrol into:

Calculus 2 in semester 1 and
Linear Algebra in semester 2

Subjects listed below **MUST** be taken in this approved order, regardless of semester availability.

Semester 1

Subject	Study Period Commencement:	Credit Points:
ENGR10004 Engineering Systems Design 1	Semester 1, Semester 2	12.50
MAST10005 Calculus 1	Semester 1, Semester 2	12.50

Breadth subject (http://handbook.unimelb.edu.au/breadth/index.html) (12.5 points), and

Science elective (12.5 points), chosen with reference to information provided below and /or in conjunction with course advice.

For students intending to complete Chemical Engineering or Chemical & Biomolecular Engineering:
610-101 Chemistry 1 (CHEM10003)

For students intending to complete Electrical Engineering or Mechanical Engineering:
640-131 Physics 1 (PHYC10003)

For students intending to complete Software Engineering:
600-151 Informatics 1: Practical Computing (INFO10001)

Students intending to complete Civil Engineering may choose one of 610-101 Chemistry 1 (CHEM10003), 600-151 Informatics 1: Practical Computing (INFO10001) or 640-131 Physics 1 (PHYC10003) to keep other Engineering options open, or may wish to choose a complementary Science subject

Semester 2

Subject	Study Period Commencement:	Credit Points:
ENGR10003 Engineering Systems Design 2	Summer Term, Semester 2	12.50
MAST10006 Calculus 2	Semester 1, Semester 2	12.50

Breadth subject (http://handbook.unimelb.edu.au/breadth/index.html) (12.5 points)

Science elective (12.5 points), chosen with reference to information provided below and /or in conjunction with course advice.

For students intending to complete Chemical & Biomolecular Engineering:

610-102 Chemistry 2 (CHEM10004)

For students intending to complete Electrical Engineering or Mechanical Engineering;
640-132 Physics 2: Physical Science and Technology (PHYC10004)

For students intending to complete Software Engineering:
600-152 Informatics 2: People, Data and the Web (INFO10002)

Students intending to complete Civil Engineering may choose one of 610-102 Chemistry 2 (CHEM10004), 600-152 Informatics 2: People, Data and the Web (INFO10002) or 640-132 Physics 2: Physical Science and Technology (PHYC10004) to keep other Engineering options open, or may wish to choose a complementary Science subject.

Second Year

Subjects **MUST** be taken in this approved order, regardless of semester availability.

Students who have already completed 620-156 Linear Algebra in first year should take 620-293 Engineering Mathematics in Semester 1 and an additional Science or Engineering elective in Semester 2.

Chemical Engineering, Chemical and Biomolecular Engineering - Semester 1

Subject	Study Period Commencement:	Credit Points:
CHEN20007 Chemical Process Analysis 1	Semester 1	12.50
MAST10007 Linear Algebra	Summer Term, Semester 1, Semester 2	12.50
CHEM20018 Reactions and Synthesis	Semester 1	12.50

Breadth subject (http://handbook.unimelb.edu.au/breadth/index.html) (12.5 points)

Chemical Engineering, Chemical and Biomolecular Engineering - Semester 2

Subject	Study Period Commencement:	Credit Points:
CHEN20008 Chemical Process Analysis 2	Semester 2	12.50
CHEN20009 Transport Processes	Semester 2	12.50
MAST20029 Engineering Mathematics	Summer Term, Semester 1, Semester 2	12.50
ENGR30001 Fluid Mechanics	Semester 1, Semester 2	12.50

Civil Engineering - Semester 1

Subject	Study Period Commencement:	Credit Points:
MAST10007 Linear Algebra	Summer Term, Semester 1, Semester 2	12.50
ENGR20004 Engineering Mechanics	January, Semester 1, Semester 2	12.50

Breadth subject (http://handbook.unimelb.edu.au/breadth/index.html) (12.5 points)

Science or Engineering elective (12.5 points)

A Science or Engineering elective is any first or second year subject in Science or Engineering for which the student has the appropriate prerequisites.

Civil Engineering - Semester 2

Subject	Study Period Commencement:	Credit Points:
MAST20029 Engineering Mathematics	Summer Term, Semester 1, Semester 2	12.50
ENGR20003 Engineering Materials	Semester 2	12.50
ENEN20002 Earth Processes for Engineering	Semester 2	12.50

Breadth subject (http://handbook.unimelb.edu.au/breadth/index.html) (12.5 points)

Electrical Engineering, Mechanical Engineering - Semester 1

Subject	Study Period Commencement:	Credit Points:
COMP20005 Engineering Computation	Semester 1, Semester 2	12.50
MAST10007 Linear Algebra	Summer Term, Semester 1, Semester 2	12.50

Breadth subject (http://handbook.unimelb.edu.au/breadth/index.html) (12.5 points)

Science or Engineering elective (12.5 points)

A Science or Engineering elective is any first or second year subject in Science or Engineering for which the student has the appropriate prerequisites.

Electrical Engineering, Mechanical Engineering - Semester 2

Subject	Study Period Commencement:	Credit Points:
ELEN20005 Foundations of Electrical Networks	January, Semester 2	12.50
ENGR20004 Engineering Mechanics	January, Semester 1, Semester 2	12.50
MAST20029 Engineering Mathematics	Summer Term, Semester 1, Semester 2	12.50

Approved elective (12.5 points)

An Approved elective is any subject in Science or Engineering for which the student has the appropriate prerequisites or any subject from outside Science and Engineering for which the student has the appropriate prerequisites, and for which approval has been granted by the Stream Coordinator.

Note:
For the Electrical Engineering stream 620-293 Engineering Mathematics (MAST20029) may be replaced by 620-295 Real Analysis with Applications (MAST20026)

Software Engineering - Semester 1

Subject	Study Period Commencement:	Credit Points:
COMP20006 Programming the Machine	Semester 1, Semester 2	12.50
MAST10007 Linear Algebra	Summer Term, Semester 1, Semester 2	12.50

Breadth subject (http://handbook.unimelb.edu.au/breadth/index.html) (12.5 points)

Science or Engineering elective (12.5 points)

A Science or Engineering elective is any first or second year subject in Science or Engineering for which the student has the appropriate prerequisites.

Software Engineering - Semester 2

Subject	Study Period Commencement:	Credit Points:
SWEN20003 Object Oriented Software Development	Semester 2	12.50
COMP20003 Algorithms and Data Structures	Semester 1, Semester 2	12.50
COMP20004 Discrete Structures	Semester 2	12.50

Breadth subject (http://handbook.unimelb.edu.au/breadth/index.html) (12.5 points)

Third Year

Subjects **MUST** be taken in this approved order, regardless of semester availability.

Chemical Engineering - Semester 1

Subject	Study Period Commencement:	Credit Points:
CHEN30001 Reactor Engineering	Semester 1	12.50
CHEN30005 Heat and Mass Transport Processes	Semester 1	12.50
CHEN30013 Chemical Engineering Management	Semester 1	12.50
CHEN90015 Biomolecular Process Principles	Semester 1	12.50

Chemical Engineering - Semester 2

Subject	Study Period Commencement:	Credit Points:
CHEN30009 Process Dynamics and Control	Semester 2	12.50
BIEN30001 Bionanoengineering	Semester 2	12.50
CHEN90007 Advanced Thermo & Reactor Engineering	Semester 2	12.50
CHEN40014 Bioenvironmental Engineering	Semester 2	12.50

Or

Subject	Study Period Commencement:	Credit Points:
CHEN90017 Process Engineering Case Studies	Semester 2	12.50

Chemical and Biomolecular Engineering - Semester 1

Subject	Study Period Commencement:	Credit Points:
CHEN30001 Reactor Engineering	Semester 1	12.50
CHEN30005 Heat and Mass Transport Processes	Semester 1	12.50
CHEN30013 Chemical Engineering Management	Semester 1	12.50
CHEN90008 Biology for Engineers	Semester 1	12.50

Chemical and Biomolecular Engineering - Semester 2

Subject	Study Period Commencement:	Credit Points:
CHEN30009 Process Dynamics and Control	Semester 2	12.50
BIEN30001 Bionanoengineering	Semester 2	12.50
CHEN90016 Metabolic Engineering	Semester 2	12.50
CHEN40014 Bioenvironmental Engineering	Semester 2	12.50

Or

Subject	Study Period Commencement:	Credit Points:
CHEN90017 Process Engineering Case Studies	Semester 2	12.50

Civil Engineering - Semester 1

Subject	Study Period Commencement:	Credit Points:
ENGR30001 Fluid Mechanics	Semester 1, Semester 2	12.50
CVEN30008 Risk Analysis	Semester 1	12.50
CVEN90043 Sustainable Infrastructure Systems	Semester 1	12.50
CVEN90044 Engineering Site Characterisation	Semester 1	12.50

Civil Engineering - Semester 2

Subject	Study Period Commencement:	Credit Points:
CVEN30010 Systems Modelling and Design	Semester 2	12.50
CVEN30009 Structural Theory and Design	Semester 2	12.50
CVEN90045 Engineering Project Implementation	Semester 2	12.50
CVEN40011 Transport Systems	Semester 2	12.50

Electrical Engineering - Semester 1

Subject	Study Period Commencement:	Credit Points:
ELEN30010 Digital System Design	Semester 1	12.50
ELEN30009 Electrical Network Analysis and Design	Semester 1	12.50

Approved elective (12.5 points)

An Approved elective is any subject in Science or Engineering for which the student has the appropriate prerequisites or any subject from outside Science and Engineering for which the student has the appropriate prerequisites, and for which approval has been granted by the Stream Coordinator.

Engineering elective (12.5 points)

An Engineering elective must be taken from subjects offered by the Melbourne School of Engineering and is subject to approval by the Stream Coordinator.

Electrical Engineering - Semester 2

Subject	Study Period Commencement:	Credit Points:
ELEN30011 Electrical Device Modelling	Semester 2	12.50
ELEN30012 Signals and Systems	Semester 2	12.50
ELEN30013 Electronic System Implementation	Semester 2	12.50

Approved elective (12.5 points)

An Approved elective is any subject in Science or Engineering for which the student has the appropriate prerequisites or any subject from outside Science and Engineering for which the student has the appropriate prerequisites, and for which approval has been granted by the Stream Coordinator.

Mechanical Engineering - Semester 1

Subject	Study Period Commencement:	Credit Points:
MCEN30015 Thermofluids	Semester 1	12.50
MCEN30017 Mechanics & Materials	Semester 1	12.50
MCEN30016 Mechanical Dynamics	Semester 1	12.50
MCEN90010 Finance & Human Resources for Engineers	Semester 1	12.50

Mechanical Engineering - Semester 2

Subject	Study Period Commencement:	Credit Points:
MCEN90008 Fluid Dynamics	Semester 2	12.50
MCEN40024 Solid Mechanics	Semester 2	12.50
MCEN90009 Dynamics of Machines	Semester 2	12.50
MCEN30014 Mechanical Design	Semester 2	12.50

Software Engineering - Semester 1

Subject	Study Period Commencement:	Credit Points:
SWEN30006 Software Modelling and Design	Semester 1	12.50
SWEN90008 Software Processes and Management	Semester 1	12.50

Computer Science and Software Engineering elective (12.5 points)

A Computer Science and Software Engineering elective must be taken from subjects offered by the Department of Computer Science and Software Engineering, and is subject to approval by the Stream Coordinator.

Approved elective (12.5 points)

An Approved elective is any subject in Science or Engineering for which the student has the appropriate prerequisites or any subject from outside Science and Engineering for which the student has the appropriate prerequisites, and for which approval has been granted by the Stream Coordinator.

Software Engineering - Semester 2

	<table><tr><th>Subject</th><th>Study Period Commencement:</th><th>Credit Points:</th></tr><tr><td>SWEN30004 Software Engineering Project</td><td>Semester 2</td><td>12.50</td></tr><tr><td>SWEN90006 Software Engineering Methods</td><td>Semester 2</td><td>12.50</td></tr></table> *Computer Science and Software Engineering elective (12.5 points)* A Computer Science and Software Engineering elective must be taken from subjects offered by the Department of Computer Science and Software Engineering, and is subject to approval by the Stream Coordinator. *Approved elective (12.5 points)* An approved elective is any subject in Science or Engineering for which the student has the appropriate prerequisites or any subject from outside Science and Engineering for which the student has the appropriate prerequisites, and for which approval has been granted by the Stream Coordinator.
Breadth Options:	Breadth subjects offer you the opportunity to choose additional subjects from outside your major study area (**learn more about breadth subjects (http://breadth.unimelb.edu.au/breadth/info/index.html)**) . **View breadth subjects for this course (/faces/htdocs/user/breadth/BreadthSearchResults.jsp?breadthcourse=355AA&year=2010)** .
Entry Requirements:	Please refer to the following website for admissions requirements: **http://www.eng.unimelb.edu.au/Undergrad/beng.html (http://www.eng.unimelb.edu.au/Undergrad/beng.html)**
Core Participation Requirements:	For the purposes of considering request for Reasonable Adjustments under the Disability Standards for Education (Cwth 2005), and Students Experiencing Academic Disadvantage Policy, academic requirements for this subject are articulated in the Subject Description, Subject Objectives, Generic Skills and Assessment Requirements of this entry. The University is dedicated to provide support to those with special requirements. Further details on the disability support scheme can be found at the Disability Liaison Unitwebsite: http://www.services.unimelb.edu.au/disability/
Further Study:	On completion of a Bachelor of Engineering, students may choose to apply for candidature in a Masters by Research (Master of Philosophy) or PhD degree. They may also apply to undertake a range of Specialised Masters coursework degrees.
Graduate Attributes:	The Bachelor of Engineering is a professional degree. Graduates can obtain professional recognition by joining Engineers Australia, which has accredited these programs. For details, see “Objectives”.
Professional Accreditation:	Accreditation has been received from: Engineers Australia (all specialisations) Australian Computer Society (Software specialisation) IChemE (Chemical, and Chemical and Biomolecular specialisations)
Generic Skills:	An Engineering graduate has a unique skill set comprising a blend of technical, business and interpersonal skills. Upon completion of the Bachelor of Engineering at the University of Melbourne, students will have strong analytical skills, the ability to lead teams and projects and the creativity to look at problems in a way that provides innovative solutions. Our graduates are known for their high standards and professionalism, their understanding of global issues and their outstanding communication skills. For details, see “Objectives”.
Notes:	None