

## 375-AA Bachelor of Engineering (Mechatronics) and Bachelor of Computer Science

<b>Year and Campus:</b>	2008
<b>Fees Information:</b>	Subject EFTSL, Level, Discipline & Census Date, <a href="http://enrolment.unimelb.edu.au/fees">http://enrolment.unimelb.edu.au/fees</a>
<b>Level:</b>	Undergraduate
<b>Duration &amp; Credit Points:</b>	
<b>Contact:</b>	-
<b>Course Overview:</b>	<p>The department was first established after the Second World War, although the course in mechanical engineering began in 1907 as a Faculty stream. An industrial engineering degree was added in the late 1950s. In 1988 an extensive review of the curriculum led to the undergraduate courses being restructured into a new, single degree course in mechanical and manufacturing engineering with students having the option to choose specialisations in their last year. A 1995 review of the department by a team from the US and UK ranked its research and teaching at the highest international standards. In 1996, the five-year combined degree in mechatronics commenced. Mechanical and manufacturing engineering applies human and material resources to the design, construction, operation and maintenance of machines (supported increasingly by sophisticated computer technology) to move people, goods and materials; generate energy; produce goods and services; and control pollution and dispose of wastes. It interacts with all other branches of engineering including the medical sciences.</p> <p>Student are required to complete 500 points in the Bachelor of Engineering (Mechatronics)/ Bachelor of Computer Science degree.</p> <p>First-year students acquire a flexible, broad scientific training in mathematics, computing and physics and an introduction to engineering.</p> <p>Second-year students continue with mathematics and are introduced to engineering design plus basic mechanical engineering sciences (thermodynamics, fluid mechanics, mechanics and machine dynamics), materials and electro-mechanical system modelling.</p> <p>Third year students continue engineering science, engineering design, manufacturing studies and control systems.</p> <p>Fourth year includes a major project and electives in advanced engineering; in manufacturing, bioengineering, applied mechanics, fluids, energy, mechatronics and management. Students planning to enter industry directly after graduating can choose how best to prepare for their careers, bearing in mind that many design and research engineers move into management. Many students participate in industry challenges such as the Formula SAE-A competition, or other build and demonstrate projects that are world competitive.</p> <p>In laboratory, research and design work students have access to specialised facilities for materials testing, wind tunnels, engine test cells and a heavy engineering workshop for the manufacture of testing facilities and experimental equipment.</p> <p>Engineering design, which draws on the Faculty's extensive computer facilities and computational mechanics, is now established as an area of study and research in conjunction with computer science.</p> <p>Graduate research programs are available in aspects of mechanical, mechatronics, manufacturing and bioengineering. The department is internationally regarded in fluid mechanics, advanced automotive engineering technology, machine dynamics, mechatronics and biomedical engineering.</p>
<b>Objectives:</b>	-
<b>Course Structure &amp; Available Subjects:</b>	<p>The recommended or standard course structures are listed below. When setting the timetable every effort will be made to avoid clashes between the times of classes associated with these sets of subjects. Students should be aware however, that if it proves to be impossible to achieve a timetable without clashes in these sets of subjects, the Faculty reserves the right to modify course structures in order to eliminate the conflicts. Students will be advised during the enrolment period of the semester if the recommended courses need to be varied. Where the courses include elective subjects these should be chosen so that timetable clashes are avoided. In particular, students in combined degrees should plan their courses so that the subjects chosen in the other faculty do not clash with those recommended for the engineering component.</p>

**Note:** Students must not undertake Science Mathematics in place of 431-201 Engineering Analysis A and 431-202 Engineering Analysis B without first obtaining course advice.

**Subject Options:**

THERE WILL BE NO FIRST YEAR ENTRY INTO THIS COURSE FROM 2008.

**Second Year**

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

**Semester 1**

Subject	Study Period Commencement:	Credit Points:
436-285 Engineering Design and Materials 1	Semester 1	12.50
431-201 Engineering Analysis A	Semester 1	12.50
431-204 Digital Systems 2: System Design	Semester 1	12.50
436-202 Mechanics 1	1	12.500

**Semester 2**

Subject	Study Period Commencement:	Credit Points:
436-286 Engineering Design & Materials 2	Semester 2	12.50
436-204 Systems Modelling	Semester 2	12.50
431-202 Engineering Analysis B	Summer, 1, 2	12.500
436-201 Thermofluids 1	Semester 2	12.50

**Third Year**

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

**Semester 1**

Subject	Study Period Commencement:	Credit Points:
433-252 Software Engineering Principles & Tools	Semester 1	12.50
436-353 Mechanics 2	Semester 1	12.50
431-210 Electrical Circuits 2	Semester 1	12.50
436-382 Control Systems 1	Semester 1	12.50

**Semester 2**

Subject	Study Period Commencement:	Credit Points:
433-254 Software Design	Not offered 2008	12.50
436-354 Mechanics 3	Semester 2	12.50
620-370 Statistics for Mechanical Engineers	Semester 2	12.50
433-253 Algorithms and Data Structures	Semester 1	12.50

**Fourth Year**

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

**Semester 1**

Subject	Study Period Commencement:	Credit Points:
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433-332 Operating Systems	Semester 1	12.50
433-341 Software Engineering Process & Practice	Semester 1	12.50
436-384 Engineering Design & Processes 1	Semester 1	12.50
436-351 Thermofluids 2	Semester 1	12.50

**Semester 2**

Subject	Study Period Commencement:	Credit Points:
433-255 Logic and Computation	Not offered 2008	12.50
433-353 Networks and Communications	Semester 2	12.50
436-311 Engineering Design & Processes 2	Semester 2	12.50

Elective (12.5 points)

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

Subject	Study Period Commencement:	Credit Points:
436-492 Major Project and Professional Practice	Year Long	25

OR

Subject	Study Period Commencement:	Credit Points:
433-465 Major Project & Professional Practice	Year Long	25

**Semester 1**

Subject	Study Period Commencement:	Credit Points:
436-470 Control Systems 2	Semester 1	12.50

Elective(s) (25 points)

**Semester 2**

Elective(s) (37.5 points)

**Note:** Electives taken in the last three semesters of the course must include 37.5 points of BCS electives and 37.5 points of BE electives taken from the subjects listed below. The BE electives must include at least one management subject, as well as 436-431 OR BOTH 436-352 and 436-432.

**BCS Electives**

Choose a total of 37.5 points to be taken for the course from the list below:

Subject	Study Period Commencement:	Credit Points:
431-467 Digital Systems 4: High Speed Systems	Semester 2	12.50
433-303 Artificial Intelligence	Semester 2	12.50
433-313 Computer Design	Semester 2	12.50
433-330 Theory of Computation	Semester 1	12.50
433-342 Software Engineering Methods	Semester 2	12.50
433-351 Database Systems	Semester 1	12.50
433-361 Programming Language Implementation	Not offered 2008	12.50

433-371 Interactive System Design	Semester 2	12.50
433-380 Graphics and Computation	Semester 1	12.50
433-385 Modelling, Analysis and Visualisation	Not offered 2008	12.500

### Engineering Electives

Must include 436-431 or both 436-352 and 436-431 and one management subject

Subject	Study Period Commencement:	Credit Points:
431-328 Digital Systems 3: Circuits and Systems	Semester 2	12.50
431-331 Electronic Circuit Design 2	Semester 1	12.50
433-483 Computer Vision and Image Processing	Not offered 2008	12.50
436-352 Thermofluids 3	Semester 2	12.50
436-431 Mechanics 4	Semester 1	12.50
436-432 Thermofluids 4	Semester 1	12.50
436-443 Production Engineering	Not offered 2008	12.500
436-459 Advanced Control and Automation	Semester 2	12.50
436-419 Computational Biomechanics	Semester 2	12.50
436-421 Power Generation Systems	Semester 2	12.50
436-436 Advanced Computational Mechanics	Semester 2	12.50
436-439 Dynamics of Rotors	Not offered 2008	12.500
436-460 Advanced Engineering Materials	Semester 2	12.50
436-461 Advanced Mechanics of Solids	Not offered 2008	12.500
436-465 Advanced Fluid Mechanics	Semester 2	12.50

### Management Electives

Choose at least one elective from the list below:

Subject	Study Period Commencement:	Credit Points:
325-201 Organisational Behaviour	Semester 1, Semester 2	12.50
325-209 Human Resource Management	Semester 1, Semester 2	12.50
325-211 Principles of Marketing	Summer, 1, 2	12.500
325-302 Strategic Marketing	Summer, 2	12.500
325-308 Industrial Relations	Semester 1	12.50
436-284 Organisational Engineering	Semester 1	12.50
436-414 Optimisation	Semester 2	12.50
436-415 Quality Engineering	Semester 2	12.50

#### Core Participation Requirements:

<p>For the purposes of considering request for Reasonable Adjustments under the Disability Standards for Education (Cwth 2005), and Student Support and Engagement Policy, academic requirements for this subject are articulated in the Subject Overview, Learning Outcomes, Assessment and Generic Skills sections of this entry.</p> <p>It is University policy to take all reasonable steps to minimise the impact of disability upon academic study, and

reasonable adjustments will be made to enhance a student's participation in the University's programs. Students who feel their disability may impact on meeting the requirements of this subject are encouraged to discuss this matter with a Faculty Student Adviser and Student Equity and Disability Support: <http://services.unimelb.edu.au/disability>