

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

| | |
|--------------------------------------|---|
| Year and Campus: | 2009 |
| Fees Information: | Subject EFTSL, Level, Discipline & Census Date, http://enrolment.unimelb.edu.au/fees |
| Level: | Undergraduate |
| Duration & Credit Points: | |
| Contact: | <p>Engineering Student Centre Ground Floor, Old Engineering Building The University of Melbourne Victoria 3010 AUSTRALIA Tel: +61 3 8344 6703 Fax: +61 3 9349 2182 Email http://eng-unimelb.custhelp.com (Engineering%20Student%20Centre%20%20Ground%20Floor,%20Old%20Engineering%20Building%20The%20University%20of%20Melbourne%20Victoria%203010%20AUSTRALIA%20%20Tel:%20+61%203%208344%206703%20Fax:%20+61%203%209349%202182%20%20Email%20http://eng-unimelb.custhelp.com)</p> |
| Course Overview: | <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> |
| Objectives: | - |

| Course Structure & Available Subjects: | <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> <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.</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|----------------|----------------------------|----------------|---|------------|--------|---------------------|------------|--------|-------------------------------|------------|--------|---------------------------|------------|--------|---------|----------------------------|----------------|-------------------------|------------------|-------|---------------------|------------|--------|---|------------|--------|--|------------|--------|---------|----------------------------|----------------|---------------------------|------------|--------|---|------------|--------|--|------------|--------|------------------------|------------|--------|---------|----------------------------|----------------|-------------------------------|------------------|-------|-------------------------------------|------------|--------|
| Subject Options: | <p>THERE WILL BE NO FIRST YEAR ENTRY INTO THIS COURSE FROM 2008.</p> <p>Third Year</p> <p>Subjects listed below MUST be taken in this approved order, regardless of semester availability.</p> <p>Semester 1</p> <table border="1" data-bbox="392 707 1487 1021"> <thead> <tr> <th>Subject</th> <th>Study Period Commencement:</th> <th>Credit Points:</th> </tr> </thead> <tbody> <tr> <td>433-252 Software Engineering Principles & Tools</td> <td>Semester 1</td> <td>12.500</td> </tr> <tr> <td>436-353 Mechanics 2</td> <td>Semester 1</td> <td>12.500</td> </tr> <tr> <td>431-210 Electrical Circuits 2</td> <td>Semester 1</td> <td>12.500</td> </tr> <tr> <td>436-382 Control Systems 1</td> <td>Semester 1</td> <td>12.500</td> </tr> </tbody> </table> <p>Semester 2</p> <table border="1" data-bbox="392 1055 1487 1368"> <thead> <tr> <th>Subject</th> <th>Study Period Commencement:</th> <th>Credit Points:</th> </tr> </thead> <tbody> <tr> <td>433-254 Software Design</td> <td>Not offered 2009</td> <td>12.50</td> </tr> <tr> <td>436-354 Mechanics 3</td> <td>Semester 2</td> <td>12.500</td> </tr> <tr> <td>620-370 Statistics for Mechanical Engineers</td> <td>Semester 2</td> <td>12.500</td> </tr> <tr> <td>433-253 Algorithms and Data Structures</td> <td>Semester 1</td> <td>12.500</td> </tr> </tbody> </table> <p>Fourth Year</p> <p>Subjects listed below MUST be taken in this approved order, regardless of semester availability.</p> <p>Semester 1</p> <table border="1" data-bbox="392 1496 1487 1809"> <thead> <tr> <th>Subject</th> <th>Study Period Commencement:</th> <th>Credit Points:</th> </tr> </thead> <tbody> <tr> <td>433-332 Operating Systems</td> <td>Semester 1</td> <td>12.500</td> </tr> <tr> <td>433-341 Software Engineering Process & Practice</td> <td>Semester 1</td> <td>12.500</td> </tr> <tr> <td>436-384 Engineering Design & Processes 1</td> <td>Semester 1</td> <td>12.500</td> </tr> <tr> <td>436-351 Thermofluids 2</td> <td>Semester 1</td> <td>12.500</td> </tr> </tbody> </table> <p>Semester 2</p> <table border="1" data-bbox="392 1843 1487 2038"> <thead> <tr> <th>Subject</th> <th>Study Period Commencement:</th> <th>Credit Points:</th> </tr> </thead> <tbody> <tr> <td>433-255 Logic and Computation</td> <td>Not offered 2009</td> <td>12.50</td> </tr> <tr> <td>433-353 Networks and Communications</td> <td>Semester 2</td> <td>12.500</td> </tr> </tbody> </table> | Subject | Study Period Commencement: | Credit Points: | 433-252 Software Engineering Principles & Tools | Semester 1 | 12.500 | 436-353 Mechanics 2 | Semester 1 | 12.500 | 431-210 Electrical Circuits 2 | Semester 1 | 12.500 | 436-382 Control Systems 1 | Semester 1 | 12.500 | Subject | Study Period Commencement: | Credit Points: | 433-254 Software Design | Not offered 2009 | 12.50 | 436-354 Mechanics 3 | Semester 2 | 12.500 | 620-370 Statistics for Mechanical Engineers | Semester 2 | 12.500 | 433-253 Algorithms and Data Structures | Semester 1 | 12.500 | Subject | Study Period Commencement: | Credit Points: | 433-332 Operating Systems | Semester 1 | 12.500 | 433-341 Software Engineering Process & Practice | Semester 1 | 12.500 | 436-384 Engineering Design & Processes 1 | Semester 1 | 12.500 | 436-351 Thermofluids 2 | Semester 1 | 12.500 | Subject | Study Period Commencement: | Credit Points: | 433-255 Logic and Computation | Not offered 2009 | 12.50 | 433-353 Networks and Communications | Semester 2 | 12.500 |
| Subject | Study Period Commencement: | Credit Points: | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 433-252 Software Engineering Principles & Tools | Semester 1 | 12.500 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 436-353 Mechanics 2 | Semester 1 | 12.500 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 431-210 Electrical Circuits 2 | Semester 1 | 12.500 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 436-382 Control Systems 1 | Semester 1 | 12.500 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Subject | Study Period Commencement: | Credit Points: | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 433-254 Software Design | Not offered 2009 | 12.50 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 436-354 Mechanics 3 | Semester 2 | 12.500 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 620-370 Statistics for Mechanical Engineers | Semester 2 | 12.500 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 433-253 Algorithms and Data Structures | Semester 1 | 12.500 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Subject | Study Period Commencement: | Credit Points: | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 433-332 Operating Systems | Semester 1 | 12.500 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 433-341 Software Engineering Process & Practice | Semester 1 | 12.500 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 436-384 Engineering Design & Processes 1 | Semester 1 | 12.500 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 436-351 Thermofluids 2 | Semester 1 | 12.500 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Subject | Study Period Commencement: | Credit Points: | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 433-255 Logic and Computation | Not offered 2009 | 12.50 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 433-353 Networks and Communications | Semester 2 | 12.500 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| | | |
|--|------------|--------|
| 436-311 Engineering Design & Processes 2 | Semester 2 | 12.500 |
|--|------------|--------|

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 | 25.000 |

OR

| Subject | Study Period Commencement: | Credit Points: |
|---|----------------------------|----------------|
| 433-465 Major Project & Professional Practice | Not offered 2009 | 25.000 |

Semester 1

| Subject | Study Period Commencement: | Credit Points: |
|---------------------------|----------------------------|----------------|
| 436-470 Control Systems 2 | Semester 1 | 12.500 |

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 | 12.500 |
| 433-303 Artificial Intelligence | Semester 2 | 12.500 |
| 433-313 Computer Design | Semester 2 | 12.500 |
| 433-330 Theory of Computation | Semester 1 | 12.500 |
| 433-342 Software Engineering Methods | Semester 2 | 12.500 |
| 433-351 Database Systems | Semester 1 | 12.500 |
| 433-361 Programming Language Implementation | Not offered 2009 | 12.500 |
| 433-371 Interactive System Design | Semester 2 | 12.500 |
| 433-380 Graphics and Computation | Semester 1 | 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 | 12.500 |
| 431-331 Electronic Circuit Design 2 | Semester 1 | 12.500 |
| 433-483 Computer Vision and Image Processing | Not offered 2009 | 12.500 |

| | | |
|--|------------------|--------|
| 436-352 Thermofluids 3 | Semester 2 | 12.500 |
| 436-431 Mechanics 4 | Semester 1 | 12.500 |
| 436-432 Thermofluids 4 | Semester 1 | 12.500 |
| 436-443 Production Engineering | Not offered 2009 | 12.50 |
| 436-459 Advanced Control and Automation | Semester 2 | 12.500 |
| 436-419 Computational Biomechanics | Semester 2 | 12.500 |
| 436-421 Power Generation Systems | Not offered 2009 | 12.500 |
| 436-436 Advanced Computational Mechanics | Semester 2 | 12.500 |
| 436-439 Dynamics of Rotors | Not offered 2009 | 12.50 |
| 436-460 Advanced Engineering Materials | Semester 2 | 12.500 |
| 436-461 Advanced Mechanics of Solids | Not offered 2009 | 12.50 |
| 436-465 Advanced Fluid Mechanics | Semester 2 | 12.500 |

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 | 12.500 |
| 325-209 Human Resource Management | Semester 1, Semester 2 | 12.500 |
| 325-211 Principles of Marketing | Not offered 2009 | 12.50 |
| 325-302 Strategic Marketing | Not offered 2009 | 12.50 |
| 325-308 Industrial Relations | Semester 1 | 12.500 |
| 436-284 Organisational Engineering | Semester 1 | 12.500 |
| 436-414 Optimisation | Semester 2 | 12.500 |
| 436-415 Quality Engineering | Semester 2 | 12.500 |

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</p>