Specialisation

Mechatronic Engineering

MTRNAH

The Mechatronic Engineering stream provides the student with the ability to acquire a hybrid range of skills based on mechanics, electronics and computing. Whilst there is a comprehensive coverage of mechanical engineering and design areas, the stream enables a deeper understanding of the principles supporting the conception, design, construction, maintenance, integration and repair of intelligent machines. Typical examples of these machines are robots, white goods, cameras, automated test equipment and transport vehicles.

Typical fields which may be encompassed by the program include building services, computer controlled plant, manufacturing, robotics and autonomous vehicles. An emphasis is placed on the application of engineering science, development and management in these fields.
<table>
<thead>
<tr>
<th><strong>Faculty</strong></th>
<th>Faculty of Engineering</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>School</strong></td>
<td>School of Mechanical and Manufacturing Engineering</td>
</tr>
<tr>
<td><strong>Study Level</strong></td>
<td>Undergraduate</td>
</tr>
<tr>
<td><strong>Minimum Units of Credit</strong></td>
<td>168</td>
</tr>
<tr>
<td><strong>Specialisation Type</strong></td>
<td>Honours</td>
</tr>
</tbody>
</table>
Available in Program(s)

Program(s) in which this honours is available

Bachelor of Engineering (Honours) - **BE (Hons)**

**3707 Engineering (Honours)**

Faculty: Faculty of Engineering  
Campus: Kensington  
Units of Credit: 192  
Typical Duration: 4 Years

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Bachelor of Engineering (Honours) - **BE (Hons)**

Master of Biomedical Engineering - **MBiomedE**

**3768 Engineering (Honours)/Biomedical Engineering**

Faculty: Faculty of Engineering  
Campus: Kensington  
Units of Credit: 240  
Typical Duration: 5 Years
Specialisation Structure

Students must complete 168 UOC.

Level 1 Core Courses

Students must take 42 UOC of the following courses.
Note: COMP1511 is the preferred computing course for the MTRN Stream.

ELEC1111 | 6 UOC
Electrical and Telecommunications Engineering

ENGG1000 | 6 UOC
Introduction to Engineering Design and Innovation

ENGG1300 | 6 UOC
Engineering Mechanics

One of the following:
MATH1131 | 6 UOC
Mathematics 1A

MATH1141 | 6 UOC
Higher Mathematics 1A

One of the following:
MATH1231 | 6 UOC
Mathematics 1B

MATH1241 | 6 UOC
Higher Mathematics 1B

One of the following:
PHYS1121 | 6 UOC
Physics 1A

PHYS1131 | 6 UOC
Higher Physics 1A
One of the following:
COMP1511 | 6 UOC
Programming Fundamentals

COMP1911 | 6 UOC
Computing 1A

**Level 2 Core Courses**

Students must take 54 UOC of the following courses.

COMP2121 | 6 UOC
Microprocessors and Interfacing

ELEC2141 | 6 UOC
Digital Circuit Design

ENGG2400 | 6 UOC
Mechanics of Solids 1

MATH2089 | 6 UOC
Numerical Methods and Statistics

MMAN2100 | 6 UOC
Engineering Design 2

MMAN2130 | 6 UOC
Design and Manufacturing

MMAN2300 | 6 UOC
Engineering Mechanics 2

MTRN2500 | 6 UOC
Computing for Mechatronic Engineers

One of the following:
MATH2018 | 6 UOC
Engineering Mathematics 2D
Students must take 24 UOC of the following courses.

**Level 3 Core Courses**

- **MMAN3000 | 6 UOC**
  Professional Engineering and Communication

- **MMAN3200 | 6 UOC**
  Linear Systems and Control

- **MTRN3020 | 6 UOC**
  Modelling and Control of Mechatronic Systems

- **MTRN3500 | 6 UOC**
  Computing Applications in Mechatronics Systems

**Level 4 Core Courses**

Students must take 30 UOC of the following courses.

- **MMAN4010 | 6 UOC**
  Thesis A

- **MMAN4020 | 6 UOC**
  Thesis B

- **MMAN4951 | 4 UOC**
  Research Thesis A

- **MMAN4952 | 4 UOC**
  Research Thesis B

- **MMAN4953 | 4 UOC**
**Disciplinary Electives**

Students must take at least 6 UOC from the following courses, and may take more subject to available UOC.

Students may select disciplinary electives from other streams within the BE(Hons) program subject to approval of the Head of School.

School approval is required prior to enrolment in the following postgraduate level courses - *MANF6860, *MANF9400,*MANF9420, *MANF9472,*MECH9325,*MECH9420, *MECH9650, *MECH9720

**ENGG2500 | 6 UOC**
Fluid Mechanics for Engineers

**ENGG3060 | 6 UOC**
Maker Games

**MANF4611 | 6 UOC**
Process Modelling and Simulation

**MANF6860 | 6 UOC**
Strategic Manufacturing Management

**MANF9400 | 6 UOC**
Industrial Management

**MANF9420 | 6 UOC**
<table>
<thead>
<tr>
<th>Course Code</th>
<th>UOC</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>MANF9472</td>
<td>6</td>
<td>Production Planning and Control</td>
</tr>
<tr>
<td>MECH4305</td>
<td>6</td>
<td>Fundamental and Advanced Vibration Analysis</td>
</tr>
<tr>
<td>MECH4320</td>
<td>6</td>
<td>Engineering Mechanics 3</td>
</tr>
<tr>
<td>MECH4620</td>
<td>6</td>
<td>Computational Fluid Dynamics</td>
</tr>
<tr>
<td>MECH4880</td>
<td>6</td>
<td>Refrigeration and Air Conditioning 1</td>
</tr>
<tr>
<td>MECH4900</td>
<td>6</td>
<td>Mechanics of Fracture and Fatigue</td>
</tr>
<tr>
<td>MECH9325</td>
<td>6</td>
<td>Fundamentals of Acoustics &amp; Noise</td>
</tr>
<tr>
<td>MECH9420</td>
<td>6</td>
<td>Composite Materials and Mechanics</td>
</tr>
<tr>
<td>MECH9650</td>
<td>6</td>
<td>Introduction to Microfluidics</td>
</tr>
<tr>
<td>MECH9720</td>
<td>6</td>
<td>Solar Thermal Energy Design</td>
</tr>
<tr>
<td>MMAN2700</td>
<td>6</td>
<td>Thermodynamics</td>
</tr>
</tbody>
</table>
Level 1 Prescribed Electives

Students can take up to a maximum of 12 UOC of the following courses.

Note:
- Students take ENGG1300 and ELEC1111 as Level 1 Core and are not required to take further Level 1 electives and may choose to substitute L1 electives for higher level electives later in the program.
- ENGG1300 excludes CVEN1300, MINE1300, and MMAN1300.
- CHEM1031 and CHEM1041 will only be available to students enrolled in a program which has a Chemistry major.

BABS1201 | 6 UOC
Molecules, Cells and Genes

BIOM1010 | 6 UOC
Engineering in Medicine and Biology

BIOS1301 | 6 UOC
Ecology, Sustainability and Environmental Science

CEIC1000 | 6 UOC
Sustainable Product Engineering and Design

CHEM1011 | 6 UOC
Chemistry 1A: Atoms, Molecules and Energy

CHEM1021 | 6 UOC
Chemistry 1B: Elements, Compounds and Life

CHEM1031 | 6 UOC
Higher Chemistry 1A: Atoms, Molecules and Energy
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Units</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM1041</td>
<td>6</td>
<td>Higher Chemistry 1B: Elements, Compounds and Life</td>
</tr>
<tr>
<td>CHEM1811</td>
<td>6</td>
<td>Engineering Chemistry 1A</td>
</tr>
<tr>
<td>CHEM1821</td>
<td>6</td>
<td>Engineering Chemistry 1B</td>
</tr>
<tr>
<td>COMP1521</td>
<td>6</td>
<td>Computer Systems Fundamentals</td>
</tr>
<tr>
<td>COMP1531</td>
<td>6</td>
<td>Software Engineering Fundamentals</td>
</tr>
<tr>
<td>CVEN1701</td>
<td>6</td>
<td>Environmental Principles and Systems</td>
</tr>
<tr>
<td>ELEC1111</td>
<td>6</td>
<td>Electrical and Telecommunications Engineering</td>
</tr>
<tr>
<td>ENGG1100</td>
<td>6</td>
<td>Grand Challenges for Engineering</td>
</tr>
<tr>
<td>ENGG1200</td>
<td>6</td>
<td>Undergraduate Special Projects</td>
</tr>
<tr>
<td>ENGG1300</td>
<td>6</td>
<td>Engineering Mechanics</td>
</tr>
<tr>
<td>ENGG1400</td>
<td>6</td>
<td>Engineering Infrastructure Systems</td>
</tr>
<tr>
<td>GEOS1111</td>
<td>6</td>
<td>Fundamentals of Geology</td>
</tr>
</tbody>
</table>
GMAT1110  |  6 UOC  
Surveying and Geospatial Engineering

MATH1081  |  6 UOC  
Discrete Mathematics

MATS1101  |  6 UOC  
Engineering Materials and Chemistry

MINE1010  |  6 UOC  
Mineral Resources Engineering

PHYS1231  |  6 UOC  
Higher Physics 1B

PSYC1001  |  6 UOC  
Psychology 1A

SOLA1070  |  6 UOC  
Sustainable Energy

**Research Thesis Rule**

- Research thesis is optional to all Undergraduate students.
- Student must seek a primary supervisor from the School of Mechanical and Manufacturing Engineering, UNSW.
- MMAN4951, MMAN4952 and MMAN4953 must be undertaken in three consecutive terms which are the final three terms of candidature.
- A student must not enrol in more than a standard full-time load involving MMAN4951, MMAN4952 and MMAN4953.
- A single thesis project is commenced in MMAN4951, proceed to MMAN4952, and completed in MMAN4953.
- MMAN4951, MMAN4952, MMAN4953 are graded courses. MMAN4951 carries 10% of the total thesis mark, MMAN4952 carries 20% of the total thesis mark, MMAN4953 carries 70% of the total thesis mark (for Honours weighting purposes).
- If a student receives a failure (FL) in MMAN4951, MMAN4952, or MMAN4953 a
student cannot proceed to the next Research Thesis course and must reattempt MMAN4951, or discontinue Research Thesis.
• If the project is abandoned during MMAN4951, MMAN4952 and MMAN4953, a completely new topic must be chosen, and the student must enrol again in MMAN4951 or discontinue with Research Thesis.

**MMAN4951 | 4 UOC**
Research Thesis A

**MMAN4952 | 4 UOC**
Research Thesis B

**MMAN4953 | 4 UOC**
Research Thesis C

**Practical/Industry-based Thesis Rule**

• Practical/Industry-based Thesis is compulsory to all Undergraduate students who do not wish to conduct Research Thesis.
• MMAN4010, MMAN4020 must be undertaken in two consecutive terms which are the final two terms of candidature.
• A student must not enrol in more than a standard full-time load involving MMAN4010 and MMAN4020
• A single thesis project is commenced in MMAN4010 and completed in MMAN4020.
• MMAN4010 and MMAN4020 are graded course, MMAN4010 carries 25% of the total thesis mark, and MMAN4020 carries 75% of the total thesis mark (for Honours weighting purposes).
• If a student receives a failure (FL) in MMAN4010, a student cannot proceed with MMAN4020, and must reattempt MMAN4010.
• If the project is abandoned during MMAN4010 or MMAN4020, a completely new topic and project team must be chosen and the student must enrol again in both MMAN4010 and MMAN4020.

**MMAN4010 | 6 UOC**
Thesis A

**MMAN4020 | 6 UOC**
Thesis B

**Level 1 Electives - Chemistry options**
Students without any prior Chemistry should choose CHEM1001. Other students with HSC Chemistry who wish to study Chemistry in more depth should choose CHEM1011.

**Enrolment Disclaimer**

You are responsible for ensuring you enrol in courses according to your program requirements. myUNSW enrolment checks that you have met enrolment requirements such as pre-requisites for individual courses but not that a course will count towards your program requirements. Do not assume that because you have enrolled in a course that the course will be credited towards your program.
**Additional Information**

**Thesis Arrangements**

- MMAN4010 and MMAN4020 must be undertaken in two consecutive semesters which are the final two semesters of candidature.
- A student must not be enrolled in more than 24 units of credit in any semester involving MMAN4010 and MMAN4020.
- A single thesis project is commenced in MMAN4010 and completed in MMAN4020. MMAN4020 carries the mark for the thesis project.
- MMAN4010 is graded satisfactory (SY)/failure (FL). If a student receives a failure (FL) in MMAN4010, a student cannot proceed with MMAN4020.
- If the project is abandoned during MMAN4020, or if MMAN4020 is failed, a completely new topic must be chosen and the student must enrol again in both MMAN4010 and MMAN4020. (For BE/MBiomedE students, read BIOM5001 instead of MMAN4010 and BIOM5003 instead of MMAN4020).
Pre-2019 Handbook Editions

Access past handbook editions (2018 and prior)

Pre-2019 Handbook Editions
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Authorised by Deputy Vice-Chancellor (Academic)
CRICOS Provider Code 00098G
ABN: 57 195 873 179