The Mechanical and Manufacturing Engineering stream is designed for students with a mechanical engineering major whose interests also lie in realising, commercialising and implementing mechanical and mechatronic systems and designs. The five core courses included as part of this stream have been designed on the basis of world best practice in manufacturing and industrial engineering and reflect a top-down - bottom-up approach, spanning the disciplines of Strategy and Management, Operations and Supply Chains, Analysis and Decision-making, Design of Product-Process Systems and Technology & Automation.

Within each discipline area this new stream will cover many conceptual and analytical techniques, all supporting fact- and data-based analysis and decision making with the aim of improved product and process performance, economy and sustainability. This stream is designed to help you to learn how to transform a design from a conceptual stage into a prototype and ultimately into a commercially realisable and viable product. This stream focuses on technical as well as commercial aspects and particularly in developing the ability to build a business or commercial case for making engineering related decisions, such as investment in plant, equipment and processes. Although the main emphasis will be on product and process, consideration will also be given to designing compatible and appropriate engineering support services. The stream also emphasises the strategic impact of operations decisions and the interfaces between operations and the other functional areas of organisations, including of course, finance. This stream encompasses the key elements of operations management and investment analysis and pulls them together in a coherent format that allows you to understand the 'big picture' as well as 'the specific details'. It is aimed at integrating the knowledge gained from the mechanical engineering courses you have studied into a framework and process that allows you to implement your designs, solutions and ideas in a commercial environment.
Mechanical engineers have traditionally played the major role in the analysis and design of complex machinery, devices such as actuators and sensors, as well as energy transformation, heat transfer and electro-mechanical processes. In an environment of global competition, sustainability (energy, environment as well as cost and capital), increasingly complex customer requirements and statutory regulations as well as the increasing pace of technological change and new product innovation, it is vital for modern engineers to possess the skills to not only design but equally importantly, implement and realize their designs in the most appropriate way. In this increasingly complex environment, successful organizations - public, private or governmental - need engineers with analytical and diverse skills, especially in integrating technical with commercial and organisational issues, analyses and ultimately solutions. It is the purpose and aim of the Mechanical and Manufacturing Engineering stream to equip you with this knowledge and understanding to become a global engineer, indeed a leader, with the ability to apply analytical methods and quality processes to create short and long term value for your organization, your customers, and the community. It encapsulates the key elements of mechanical engineering and combines them with the five core disciplines of manufacturing and industrial engineering.

An engineer trained in Mechanical and Manufacturing Engineering may be employed in a very flexible and diverse range of disciplines and areas of industrial activity, including; product design, process design, computer aided design, computer aided manufacturing, quality improvement, technical and commercial analysis and decision making, strategic decision making, consulting, sales support, technical and organisational maintenance, and supply chain management.
<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
**Specialisation Structure**

Students must complete 168 UOC.

**Level 1 Core Courses**

Students must take 42 UOC of the following courses.

*Note: ENGG1811 is the preferred Computing course for the MANFBH 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

ENGG1811  |  6 UOC
Computing for Engineers

Level 2 Core Courses

Students must take 48 UOC of the following courses.

ENGG2400  |  6 UOC
Mechanics of Solids 1

ENGG2500  |  6 UOC
Fluid Mechanics for Engineers

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

MMAN2700  |  6 UOC
Thermodynamics

One of the following:
MATH2018  |  6 UOC
Level 3 Core Courses

Students must take 42 UOC of the following courses.

MANF3100  6 UOC
Product and Manufacturing Design

MANF3510  6 UOC
Process Technology and Automation

MANF4430  6 UOC
Reliability and Maintenance Engineering

MANF4611  6 UOC
Process Modelling and Simulation

MECH3110  6 UOC
Mechanical Design 1

MMAN3000  6 UOC
Professional Engineering and Communication

MMAN3200  6 UOC
Linear Systems and Control

Level 4 Core Courses

Students must take 24 UOC of the following courses.

MANF4430  6 UOC
Reliability and Maintenance Engineering
<table>
<thead>
<tr>
<th>Code</th>
<th>UOC</th>
<th>Course</th>
</tr>
</thead>
<tbody>
<tr>
<td>MANF4611</td>
<td>6</td>
<td>Process Modelling and Simulation</td>
</tr>
<tr>
<td>MMAN4010</td>
<td>6</td>
<td>Thesis A</td>
</tr>
<tr>
<td>MMAN4020</td>
<td>6</td>
<td>Thesis B</td>
</tr>
<tr>
<td>MMAN4951</td>
<td>4</td>
<td>Research Thesis A</td>
</tr>
<tr>
<td>MMAN4952</td>
<td>4</td>
<td>Research Thesis B</td>
</tr>
<tr>
<td>MMAN4953</td>
<td>4</td>
<td>Research Thesis C</td>
</tr>
</tbody>
</table>

**Discipline Electives**

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

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

Courses marked with an asterisk (*) are postgraduate level courses and are subject to enrolment restrictions. Seek prior School approval before enrolment.


<table>
<thead>
<tr>
<th>Code</th>
<th>UOC</th>
<th>Course</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGG3060</td>
<td>6</td>
<td>Maker Games</td>
</tr>
<tr>
<td>MANF6860</td>
<td>6</td>
<td>Strategic Manufacturing Management</td>
</tr>
<tr>
<td>MANF9400</td>
<td>6</td>
<td></td>
</tr>
</tbody>
</table>
Industrial Management

**MANF9420** | 6 UOC
Operations and Supply Chain Management in Engineering

**MANF9472** | 6 UOC
Production Planning and Control

**MECH9420** | 6 UOC
Composite Materials and Mechanics

**MECH9650** | 6 UOC
Introduction to Microfluidics

**MECH9720** | 6 UOC
Solar Thermal Energy Design

**MECH9761** | 6 UOC
Automobile Engine Technology

**MMAN4410** | 6 UOC
Finite Element Methods

**MTRN4030** | 6 UOC
Optimisation Methods for Engineering Systems

**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 elective 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.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>UOC</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>BABS1201</td>
<td>6</td>
<td>Molecules, Cells and Genes</td>
</tr>
<tr>
<td>BIOM1010</td>
<td>6</td>
<td>Engineering in Medicine and Biology</td>
</tr>
<tr>
<td>BIOS1301</td>
<td>6</td>
<td>Ecology, Sustainability and Environmental Science</td>
</tr>
<tr>
<td>CEIC1000</td>
<td>6</td>
<td>Sustainable Product Engineering and Design</td>
</tr>
<tr>
<td>CHEM1011</td>
<td>6</td>
<td>Chemistry 1A: Atoms, Molecules and Energy</td>
</tr>
<tr>
<td>CHEM1021</td>
<td>6</td>
<td>Chemistry 1B: Elements, Compounds and Life</td>
</tr>
<tr>
<td>CHEM1031</td>
<td>6</td>
<td>Higher Chemistry 1A: Atoms, Molecules and Energy</td>
</tr>
<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>Course Code</td>
<td>UOC</td>
<td>Course Title</td>
</tr>
<tr>
<td>-------------</td>
<td>-----</td>
<td>-----------------------------------------</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>GEOS1111</td>
<td>6</td>
<td>Fundamentals of Geology</td>
</tr>
<tr>
<td>GMAT1110</td>
<td>6</td>
<td>Surveying and Geospatial Engineering</td>
</tr>
<tr>
<td>MATH1081</td>
<td>6</td>
<td>Discrete Mathematics</td>
</tr>
<tr>
<td>MATS1101</td>
<td>6</td>
<td>Engineering Materials and Chemistry</td>
</tr>
<tr>
<td>MINE1010</td>
<td>6</td>
<td>Mineral Resources Engineering</td>
</tr>
<tr>
<td>PHYS1231</td>
<td>6</td>
<td>Higher Physics 1B</td>
</tr>
</tbody>
</table>
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.
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.
Pre-2019 Handbook Editions

Access past handbook editions (2018 and prior)

Pre-2019 Handbook Editions