Double Degree

Materials Science and Engineering (Honours) / Engineering Science

3132 | 240 Units of Credit

Overview

This dual award program gives students the chance to develop their skills and knowledge in two areas - a Bachelor of Engineering (Honours) in Materials Science and Engineering degree plus an additional area leading to a Bachelor of Engineering Science in Chemical Engineering. Students have a pathway to enhance their professional opportunities through developing cross-disciplinary skills and knowledge within a five year program. The School of Materials Science and Engineering administers the program, and the School of Chemical Engineering provides advice on the Chemical Engineering component of the program.

The broad objective of the Engineering (Honours) undergraduate programs is to develop well-educated graduates, that is, graduates with the strong technical knowledge and the basic skills and attributes required to practise as professional engineers. The desired skills are those that enable graduates to be independent investigators; self-motivated; critical thinkers; problem solvers; life-long learners; good communicators; team players; effective managers; as well as economically, environmentally and socially aware
**Faculty**
Faculty of Science
Faculty of Engineering

**Campus**
Kensington

**Study Level**
Undergraduate

**Typical duration**
5 Years

**Intake Period**
Term 1, Term 3

**Academic Calendar**
3+ Calendar

**Minimum Units of Credit**
240

**Award(s)**
Bachelor of Engineering (Honours) - **BE(Hons)**
Bachelor of Engineering Science - **BEngSc**

**UAC Code**
429620

**CRICOS Code**
089471M
Learning Outcomes

3131 - Materials Science and Engineering (Honours)

1. Discernment of knowledge development and research directions within the engineering discipline.
   Scholars

2. Comprehensive, theory based understanding of the underpinning natural and physical sciences and the engineering fundamentals applicable to the engineering discipline.
   Scholars

3. Conceptual understanding of the mathematics, numerical analysis, statistics, and computer and information sciences which underpin the engineering discipline.
   Scholars

4. In-depth understanding of specialist bodies of knowledge within the engineering discipline.
   Scholars

5. Knowledge of engineering design practice and contextual factors impacting the engineering discipline.
   Global Citizens Professionals Scholars

6. Understanding of the scope, principles, norms, accountabilities and bounds of sustainable engineering practice in the specific discipline
   Professionals Global Citizens Scholars

7. Application of established engineering methods to complex engineering problem solving.
   Global Citizens Scholars Professionals

8. Fluent application of engineering techniques, tools and resources.
   Scholars Professionals

   Scholars Global Citizens Professionals

10. Application of systematic approaches to the conduct and management of engineering projects.
    Professionals Leaders Scholars Global Citizens

11. Ethical conduct and professional accountability.
12. Effective oral and written communication in professional and lay domains.

13. Creative, innovative and pro-active demeanour.

14. Professional use and management of information.

15. Orderly management of self, and professional conduct.

16. Effective team membership and team leadership.

**Graduate Capabilities:**

For more information on Graduate Capabilities, please click on this link.
Stand Alone Programs

Click on the link below to find out more about each individual program.

Program 3131
Materials Science and Engineering (Honours)

Program 3706
Engineering Science
Double Degree Structure

Students must complete 240 UOC.

Students are required to complete 240 UOC comprising:

1. Bachelor of Engineering (Honours) in Materials Science and Engineering - 168 UOC
2. Bachelor of Engineering Science - 96 UOC

Because of the overlap of at least 24 units of credit of engineering courses in both cores, the total units of credit required for completion is 240 UOC, rather than 264 UOC.

Specialisation Requirements

3131 - Materials Science and Engineering (Honours)

Students must complete at least one of the specialisations below.

MAJOR:

MATSE1 | 36 UOC
Materials Science and Engineering (Physical Metallurgy)

MATSF1 | 36 UOC
Materials Science and Engineering (Functional Materials)

MATSG1 | 36 UOC
Materials Science and Engineering (Process Metallurgy)

MATSH1 | 36 UOC
Materials Science and Engineering (Materials Engineering)

MATSJ1 | 36 UOC
Materials Science and Engineering (Ceramic Engineering)

Specialisation Requirement

3706 - Engineering Science
Students in program 3132 Material Science and Engineering (Honours)/Engineering Science can only take the CEICM1 - Chemical Engineering major in the Bachelor of Engineering Science.

**MAJOR:**

**CEICM1** | 96 UOC  
Chemical Engineering

**CVENJ1** | 96 UOC  
Civil Engineering

**CVENK1** | 96 UOC  
Environmental Engineering

**ELECF1** | 96 UOC  
Electrical Engineering

**MECHD1** | 96 UOC  
Mechanical Engineering

**MINEC1** | 96 UOC  
Mining Engineering

**MTRND1** | 96 UOC  
Mechatronic Engineering

**PETRB1** | 96 UOC  
Petroleum Engineering

**Level 1 Core Courses**

3131 - Materials Science and Engineering (Honours)

Students must take 42 UOC of the following courses.

**CHEM1811** | 6 UOC  
Engineering Chemistry 1A
ENGG1000  |  6 UOC
Introduction to Engineering Design and Innovation

MATS1192  |  6 UOC
Design and Application of Materials in Science and Engineering

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

PHYS1131  |  6 UOC
Higher Physics 1A

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:
COMP1911  |  6 UOC
Computing 1A

ENGG1811  |  6 UOC
Computing for Engineers

**Level 2 Core Courses**

3131 - Materials Science and Engineering (Honours)

Students must take 48 UOC of the following courses.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>UOC</th>
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<tbody>
<tr>
<td>MATH2019</td>
<td>6</td>
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<tr>
<td>Engineering Mathematics 2E</td>
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<tr>
<td>MATS2001</td>
<td>6</td>
</tr>
<tr>
<td>Physical Properties of Materials</td>
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</tr>
<tr>
<td>MATS2003</td>
<td>6</td>
</tr>
<tr>
<td>Materials Characterisation</td>
<td></td>
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<tr>
<td>MATS2004</td>
<td>6</td>
</tr>
<tr>
<td>Mechanical Behaviour of Materials</td>
<td></td>
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<tr>
<td>MATS2005</td>
<td>6</td>
</tr>
<tr>
<td>Introduction to Fluid Flow and Heat Transfer</td>
<td></td>
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<tr>
<td>MATS2006</td>
<td>6</td>
</tr>
<tr>
<td>Diffusion and Kinetics</td>
<td></td>
</tr>
<tr>
<td>MATS2007</td>
<td>6</td>
</tr>
<tr>
<td>Sustainable Materials Processing</td>
<td></td>
</tr>
<tr>
<td>MATS2008</td>
<td>6</td>
</tr>
<tr>
<td>Thermodynamics and Phase Equilibria</td>
<td></td>
</tr>
</tbody>
</table>

**Level 3 Core Courses**

3131 - Materials Science and Engineering (Honours)

Students must take 36 UOC of the following courses.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>UOC</th>
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<tbody>
<tr>
<td>MATH2089</td>
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<tr>
<td>Numerical Methods and Statistics</td>
<td></td>
</tr>
<tr>
<td>MATS3001</td>
<td>6</td>
</tr>
<tr>
<td>Micromechanisms of Mechanical Behaviour of Metals</td>
<td></td>
</tr>
<tr>
<td>MATS3002</td>
<td>6</td>
</tr>
</tbody>
</table>
Fundamentals of Ceramic Processing

**MATS3004 | 6 UOC**
Polymer Science and Engineering 1

**MATS3006 | 6 UOC**
Design and Application of Materials in Science and Engineering 3

**MATS3007 | 6 UOC**
Materials Industry Management

**Level 1 Electives**

3131 - Materials Science and Engineering (Honours)

Students must take at least 6 UOC of the following courses.

**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

**CEIC1001 | 6 UOC**
Engineering Chemistry

**COMP1921 | 6 UOC**
Computing 1B

**CVEN1701 | 6 UOC**
Environmental Principles and Systems
ELEC111 | 6 UOC
Electrical and Telecommunications Engineering

ENGG1400 | 6 UOC
Engineering Infrastructure Systems

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

MMAN1300 | 6 UOC
Engineering Mechanics

PHYS1231 | 6 UOC
Higher Physics 1B

PSYC1001 | 6 UOC
Psychology 1A

PTRL1010 | 6 UOC
Introduction to the Petroleum Industry

SOLA1070 | 6 UOC
Sustainable Energy

One of the following:
CHEM1021 | 6 UOC
Chemistry 1B: Elements, Compounds and Life

Chemistry 1B: Elements, Compounds and Life

One of the following:
CVEN1300 6 UOC
Engineering Mechanics for Civil Engineers

MINE1300 6 UOC
Engineering Mechanics

MMAN1300 6 UOC
Engineering Mechanics

One of the following:
GEOS1111 6 UOC
Fundamentals of Geology

GEOS3321 6 UOC
Fundamentals of Petroleum Geology

General Education

3706 - Engineering Science

Students must take at least 6 UOC of the following courses.

any General Education course

Level 2 Maturity Requirement

3131 - Materials Science and Engineering (Honours)

Students must have completed 36 UOC before taking any of the following courses.

any level 2 course

Level 3 Maturity Requirement
Students must have completed all Introductory core courses before taking any Level 3 course.

any level 3 course

Level 4 Maturity Requirement

Students must have completed 102 UOC before taking any of the following courses.

any level 4 Materials Science and Engineering course

Maximum Level 1 UOC

Students may only undertake a maximum of 60 UOC of the following courses, in the 168 units of credit required for the Engineering (Honours) component.

any level 1 course

Substitution & General Education Requirements

1. Students may substitute up to 12 UOC of Advanced Disciplinary courses (Level 5) in place of Disciplinary Knowledge courses from a school specified stream list of courses with the approval of the Program or Stream Authority.

2. Students are required to complete 6 units of credit of general education courses. These courses cannot be GENS or GENE courses, nor can they be any course from the Faculty of Science or the Faculty of Engineering.

3. Only courses in the BE (Hons) in Materials Science and Engineering will count towards the honours calculation.

General Education Rule

Students enrolled in programs 3132 Materials Science and Engineering (Honours)/Engineering Science and 3133 Materials Science and Engineering (Honours)
Honours / Biomedical Engineering, are required to complete 6 UOC of General Education courses.

General Education courses cannot have a course code of COMP, FOOD, GENE, GENS or SOMS nor can they be any course taken from the Faculty of Science or the Faculty of Engineering.

**Recommended Level 1 Electives**

3131 - Materials Science and Engineering (Honours)

The following courses are recommended:
- CVEN1300 or MINE1300 or MMAN1300 (6 UOC)

**Sample Double Degree(s)**

To access sample program(s), please visit:

3132 Materials Science and Engineering (Honours)/Engineering Science Sample Program

Please read the Double Degree Program rules as some specific rules apply to particular Double Degree combinations.

**Enrolment Disclaimer**

Unless advised otherwise by your program authority, you should follow the rules for the handbook for the year you commenced your program. You are also 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.
Program Fees

At UNSW fees are generally charged at course level and therefore dependent upon individual enrolment and other factors such as student's residency status. For generic information on fees and additional expenses of UNSW programs, click on one of the following:

- Domestic Students
- Commonwealth Supported Students
- International Students
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