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 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:**

<table>
<thead>
<tr>
<th>Code</th>
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<th>Description</th>
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<tbody>
<tr>
<td>CEICM1</td>
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<tr>
<td>CVENJ1</td>
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<td>Civil Engineering</td>
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<tr>
<td>CVENK1</td>
<td>96</td>
<td>Environmental Engineering</td>
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<tr>
<td>ELECF1</td>
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<td>Electrical Engineering</td>
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<tr>
<td>MECHD1</td>
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<tr>
<td>MINEC1</td>
<td>96</td>
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<tr>
<td>MTRND1</td>
<td>96</td>
<td>Mechatronic Engineering</td>
</tr>
<tr>
<td>PETRB1</td>
<td>96</td>
<td>Petroleum Engineering</td>
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**Level 1 Core Courses**

3131 - Materials Science and Engineering (Honours)

Students must take 42 UOC of the following courses.

<table>
<thead>
<tr>
<th>Code</th>
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<tbody>
<tr>
<td>CHEM1811</td>
<td>6</td>
<td>Engineering Chemistry 1A</td>
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</tbody>
</table>
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.
MATH2019  6 UOC  
Engineering Mathematics 2E

MATS2001  6 UOC  
Physical Properties of Materials

MATS2003  6 UOC  
Materials Characterisation

MATS2004  6 UOC  
Mechanical Behaviour of Materials

MATS2005  6 UOC  
Introduction to Fluid Flow and Heat Transfer

MATS2006  6 UOC  
Diffusion and Kinetics

MATS2007  6 UOC  
Sustainable Materials Processing

MATS2008  6 UOC  
Thermodynamics and Phase Equilibria

**Level 3 Core Courses**

3131 - Materials Science and Engineering (Honours)

Students must take 36 UOC of the following courses.

MATH2089  6 UOC  
Numerical Methods and Statistics

MATS3001  6 UOC  
Micromechanisms of Mechanical Behaviour of Metals

MATS3002  6 UOC
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
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<td>ENGG1400</td>
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<td>PTRL1010</td>
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<td>SOLA1070</td>
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One of the following:

<table>
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<th>UOC</th>
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<tbody>
<tr>
<td>CHEM1021</td>
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</table>
Chemistry 1B: Elements, Compounds and Life

CHEM1041  |  6 UOC
Higher Chemistry 1B: Elements, Compounds and Life

One of the following:

CVEN1300  |  6 UOC
Engineering Mechanics for Civil Engineers

MINE1300  |  6 UOC
Engineering Mechanics

One of the following:

MMAN1300  |  6 UOC
Engineering Mechanics

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
3131 - Materials Science and Engineering (Honours)

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

*any level 3 course*

**Level 4 Maturity Requirement**

3131 - Materials Science and Engineering (Honours)

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**

3131 - Materials Science and Engineering (Honours)

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**

3132 - Materials Science and Engineering (Honours) / Engineering Science

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**

3131 - Materials Science and Engineering (Honours)

Students enrolled in programs 3132 Materials Science and Engineering (Honours)/Engineering Science and 3133 Materials Science and Engineering
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