

October 2022



UNIVERSITY
OF WOLLONGONG
AUSTRALIA

Dear Materials Engineering students

Welcome back! This year has seen us transitioning back to face-to-face teaching, and we envisage a full return to campus in 2023. After the isolation of online learning in recent years, it was a pleasure teaching in person again.

The Materials Engineering curriculum for 2023 (attached) remains largely unchanged from the 2022 version. Please note that we will continue to present certain subjects only every second year, so please plan your studies accordingly. MATE303, MATE305 and MATE415 will be presented in 2023, with MATE302, MATE422 and MATE414 scheduled to be presented in 2024. It is also important to note that ENGG452 and ENGG453 is now called MMB498 (Thesis A) and MMB499 (Thesis B). Please refer to the 2023 Course Handbook for more information on co- and pre-requisites.

I would also like to bring the following to your attention at this time:

- **MATE415 Energy Storage Materials:**

We are pleased to announce that a new elective subject, MATE415 Energy Storage Materials, will be presented in the Autumn session of 2023. This subject focuses on the main energy storage methods in use today, i.e. storage in the form of artificial fuel hydrogen, batteries, supercapacitors and dielectric capacitors. Students will learn about hydrogen production methods using renewable energy sources, such as electrocatalytic water splitting, and separation technologies for clean hydrogen. Current options for storing hydrogen, including light metal hydrides, large adsorption surfaces and nanostructured materials, as well as gaseous and liquid hydrogen storage techniques, will be examined. Students will also learn about the electrochemistry, thermodynamics and material properties of rechargeable batteries. The relationship between material properties at the atomic level and real life battery performance will be explained in terms of basic electrochemistry and thermodynamics. In addition, students will learn about the important role played by capacitors in storing energy on account of their high powder density, with particular emphasis on dielectric capacitors that are widely used in electronic circuits, and pulse electronic systems.

- **Timetabling:**

Details of the timetable and room allocations for 2023 will be made available on the University's website. Please note that timetables may change at any time up to the start of session; it is therefore important that you check this information regularly.

- **Weighted Average Mark (WAM):**

To encourage progressive learning and improvement in your university studies, the grade of honours on graduation is calculated from the weighted average mark (WAM) of your performance in *all* subjects you attempted over the whole of your degree. Subjects in later years of your university study have a higher weighing in the WAM calculation. You can calculate your WAM using the following formula:

$$WAM = \sum MLC / \sum LC$$

where: C = credit point value of a subject;
 L = level (i.e. $L = 2$ for MATE201);
 M = mark (%).

This calculation must include *all* subject attempts (including any failures). Technical Fails are given a mark of 44%). The grades of honour are then awarded as follows on graduation:

First Class honours:	$77.5 < WAM \leq 100$
Second Class, Division 1 honours:	$72.5 < WAM \leq 77.5$
Second Class, Division 2 honours:	$67.5 < WAM \leq 72.5$

- **Professional Experience:**

If you are in the 2nd or 3rd year of your degree and not undertaking a Cadetship, actively pursue and obtain work experience to avoid delaying your graduation. There are strict rules for the type and duration of work that is eligible to be claimed as professional experience.

Students are required to complete at least 12 weeks of approved professional experience during their course and submit a report to a satisfactory standard as part of any Bachelor of Engineering degree program (a requirement from Engineers Australia as part of the accreditation of the course). This requirement is included in the course as the ENGG454 subject (zero credit points). Students should enrol in ENGG454 in the session before undertaking 12 weeks full time or equivalent of professional experience. It is preferable that the students undertake this requirement during the summer recess, and that professional experience is completed between the third and fourth years. It is the student's own responsibility to find Professional Experience work.

All students enrolled in ENGG454 are automatically added to the EIS PEXs system (Professional Experience system). Possible placement opportunities are posted on EIS PEXs notice boards or distributed by e-mail. All students must follow the process in EIS PEXs, starting with student enrolment and finishing with the discipline coordinator marking the student's final report.

Remember to apply for Professional Experience positions early that if you are in 2nd or 3rd year in 2023 (there is always a lot of competition for these opportunities). You should discuss any professional experience placement you are considering with the coordinator for this subject: Dr Hongtao Zhu, hongtao@uow.edu.au to ensure that it meets the relevant criteria. It is important that the suitability of the position is confirmed in advance to avoid the difficulty and disappointment that arises if your 12 week work experience does not meet the requirements.

Please note that if you complete either ENGG255 Professional Option 2, or ENGG355 Professional Option 3, you do NOT have to do ENGG454.

- **Engineers Australia, Materials Australia, and AusIMM:**

It is important for an engineering student to join an accredited professional society to develop important engineering skills and to network with other professionals in the field. Engineers Australia, Materials Australia, Weld Australia and AusIMM are the most popular societies amongst materials students and academics at UOW. More information is available at:

Engineers Australia: www.engineersaustralia.org.au/

Materials Australia: www.materialsaustralia.com.au/

Weld Australia: www.weldaustralia.com.au

AusIMM: www.ausimm.com.au/

All Materials Engineering students can now join AusIMM free using the code Student2022 at checkout.

- **MetSoc student society:**

MetSoc has been an active student society for over 50 years and promotes active networking between our students. Please join the UOW Metsoc Facebook group to keep up to date with events. We are looking forward to an exciting 2023 with the team.

- **About Materials Engineering:**

The study field of Materials Science and Engineering is somewhat different from other disciplines in that the discipline forms an integrated whole and requires systematic study with each subject building on prior knowledge obtained in earlier sessions. It is therefore important not to compartmentalise your studies and to keep in mind that you will have to apply knowledge from earlier levels to successfully pass subjects at higher levels.

- **Social media:**

Please consider following UOW Materials Engineering on social media for interesting news, updates and information. You can find us at:

Facebook: @UOWMaterials
@UOWMetsoc
Twitter: @MaterialsUOW
LinkedIn: @UOW Materials Engineering
Instagram: @UOWMaterials

In closing I would like to join all academic and support staff in wishing you the very best for the New Year. We look forward to seeing you again in the Autumn session in 2023.



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UNDERGRADUATE MATERIALS ENGINEERING DEGREE PROGRAM

Subject code	Subject name	Credit points	Session(s)	Notes
YEAR 1				
ENGG102	Fundamentals of Engineering Mechanics	6	Autumn	
ENGG103	Materials in Design	6	Autumn	
ENGG105	Engineering Design for Sustainability	6	Autumn	
MATH141	Foundations of Engineering Mathematics	6	Autumn, Spring	
ENGG100	Engineering Computing and Analysis	6	Spring	
PHYS143	Physics for Engineers	6	Spring	
MATH142	Essentials of Engineering Mathematics	6	Spring, Summer	
ENGG104	Electrical Systems	6	Spring	
YEAR 2				
CHEM103	Chemistry for Engineering	6	Autumn	
ENGG251	Mechanics of Solids	6	Autumn	
MATE205	Materials Characterisation Techniques	6	Autumn	
MATH283	Advanced Engineering Mathematics and Statistics	6	Autumn	
MATE201	Structure of Materials	6	Spring	
MATE203	Phase Transformations	6	Spring	
MATE204	Mechanical Behaviour of Materials	6	Spring	
MECH252	Thermodynamics, Experimental Methods and Analysis	6	Spring	
YEAR 3				
ENGG252	Engineering Fluid Mechanics	6	Autumn	
MATE301	Engineering Alloys	6	Autumn	
MATE306	Fracture, Failure and Degradation	6	Autumn	
MECH341	Thermodynamics of Engineering Systems	6	Autumn	
MATE302	Polymeric Materials	6	Spring	MATE302 will be presented in even years.
MATE303	Ceramics, Glasses and Refractories	6	Spring	MATE303 will be presented in odd years.
MECH343	Heat Transfer and Aerodynamics	6	Spring	
MATE305	Primary Materials Processing	6	Spring	MATE305 will be presented in odd years.
YEAR 4				
ENGG454	Professional Experience	0	Annual, Autumn, Spring	
ENGG461	Managing Engineering Projects	6	Autumn	
MATE422	Iron and Steelmaking	6	Autumn	MATE422 will be presented in even years.

Students must also complete:

MMMB498	Thesis A	12	Annual
	OR		
MMMB499	Thesis B	18	Annual

For students in MMMB498: Any 2 electives from List A, and 2 electives from List A or List B.

For students in MMMB499: Any 2 elective from List A, and 1 elective from List A or List B.

LIST A ELECTIVES**Engineering Materials Electives**

ENGG434	Introduction to Materials Welding and Joining	6	Spring
MECH421	Manufacturing Process Analysis	6	Autumn
MINE325	Foundations of Geometallurgy	6	Autumn
CIVL245	Construction Materials	6	Spring

Advanced Materials Electives

MATE411	Advanced Materials and Processing	6	Autumn
MATE412	Electronic Materials	6	Spring
BMEG306	Biomaterials and Tissue Engineering	6	Spring
BMEG304	Manufacturing Techniques for Biomedical Engineering	6	Spring
MATE414	Computational Materials Science	6	Spring
MATE415	Energy Storage Materials	6	Autumn

MATE414 will be presented in even years.

MATE415 will be presented in odd years.

Additional Materials Electives

ENGG440	Strategic Management of Engineering	6	Autumn
ENGG439	Engineering Logistics and Operations Management	6	Spring
ENGG378	Sustainable Energy technologies	6	Spring
MECH372	Solids Handling and Process Engineering	6	Spring
HUMA272	Humanitarian Studies	6	Spring