



UNIVERSITY  
OF WOLLONGONG  
AUSTRALIA

## School of Mechanical, Materials, Mechatronics & Biomedical Engineering

10<sup>th</sup> October 2022,

### INFORMATION FOR MECHATRONIC ENGINEERING STUDY PROGRAM IN 2023

Dear Mechatronic Engineering Students,

The year 2022 is difficult for everyone as the pandemic is still not fully ending. Still I hope 2022 was a successful and rewarding year for you and that you are enjoying the break away from university. If you struggled or did not perform as well as you had wished or below what you know you are capable of, let me encourage you to review what you would do differently to improve in 2023. Please remember that you are most welcome to see me if you need advice on any matters regarding your study.

The principal purpose of this letter is to let you know of some of the study program arrangements for this year – please keep this letter for future reference.

With the introduction of the new Bachelor of Engineering (Honours) degree courses 1856 – 1866 in 2015, and because some of you in 2019 are still in previous courses such as 721 or 730, there are changes that may affect your program. If you are in 721 or 730, please note that MECH252 and ECTE344 are offered in the Spring Session, ECTE301 is discontinued, ECTE324 is changed to a List A elective, and MECH470 is a core subject. MECH203 is now a prerequisite for MECH215 and is only available in the Autumn Session.

Several subjects are changed from Autumn 2022. These include: ENGG452 (Thesis A) and ENGG453 (Thesis B) are rebadged to MMMB498 and MMMB499, respectively. ECTE456 and ECTE457 are rebadged to ECTE498 and ECTE499, respectively. ECTE350 is rebadged to ECTE351, which is a 12 credit point subject. ENGG333 is an Autumn subject. If you have completed ECTE301, you can use it as a list A elective. If you will need to discuss what subjects to take in 2023 please do not hesitate to see me.

You can find full-time study program, and list of electives at the end of this letter.

### **Mechanical Engineering Practice (MECH203)**

This 0 credit point subject allows your development of practical mechanical engineering skills sufficient for successful entry to the mechanical engineering design stream: MECH215 and MECH311. It is a **prerequisite for MECH215 and MECH470 and is only on offer in Autumn Session.**

Skills developed including documentation of your engineering experience will assist with attaining work experience placements.

Those with prior experience or who have done workshop activities in a previous subject may have a varied program assigned.

Further information will be issued to those who are enrolled.

Enquiries: Dr Jon Roberts, [robertsj@uow.edu.au](mailto:robertsj@uow.edu.au).

### **Thesis Selection**

You have a choice of enrolling your thesis (12 or 18 credit points) either from the School of MMMB or the School of ECTE. The thesis subjects have the following new codes:

- MMMB498 (Thesis A, 12 credit points), previously ENGG452

- MMMB499 (Thesis B: 18 credit points), previously ENGG453
- ECTE498 (Thesis A: 12 credit points), previously ECTE456
- ECTE499 (Thesis B: 18 credit points), previously ECTE457

Students who enrol MMMB499 or ECTE499 will just need to complete one elective (either from list A or list B) eligible for graduation.

Note: to be eligible for MMMB499 (18 credit points), students must achieve the required WAM score >80.

If you would like to select a thesis topic and a supervisor from either the SECTE or MMMB School, please contact the specific thesis coordinator for advice:

ECTE498/ECTE499 coordinator: Dr Peter Vial: [peter\\_vial@uow.edu.au](mailto:peter_vial@uow.edu.au)

MMMB498/MMMB499 coordinator: Dr Zhixin Chen: [zchen@uwo.edu.au](mailto:zchen@uwo.edu.au)

### Electives

Both the School of MMMB and the School of ECTE will continue to offer a range of elective subjects which reflect the broad range of career opportunities in mechatronic engineering and which also reflect the strengths of the Mechatronic Engineering Discipline at UOW. The electives that are acceptable in the program are grouped in two different lists. The approved technical or engineering electives are provided in list A – you may take all your electives from this list. List B contains the pre-approved electives from other faculties or disciplines. You may take up to **one** elective from other faculties. Should you identify a subject not listed in either list A or B that you wish to take, you must seek approval from the Program Director before taking that subject and have that subject approved in writing by the Head of Students as counting towards your degree. The actual engineering electives vary from year to year and are dependent on staff availability. The list of engineering electives that are expected to be on offer in 2023 is provided below.

### Timetabling

Details of the timetable and room allocations can be found on the web. These are set centrally at University level and **are subject to change – it is important that you check this information as the semester approaches.**

### Weighted Average Mark (WAM)

*The best way to ensure that you get a good job following graduation is to maximise your WAM – employers judge students largely on academic performance.* You should be aware that when you graduate your grade of honours is calculated from the weighted average of your performance in every subject you have attempted over the whole of your degree. *Employers will judge applicants for jobs by their grade of honours*, so it is important to maintain the highest performance you can throughout your degree. (Remember that each 6 credit point subject requires in the order of twelve (12) hours per week of study, including time in class, for a successful outcome). You can calculate your own WAM using the following formula:

$$WAM = \frac{\sum MLC}{\sum LC}$$

where C = credit point value of subject; L = Level (ie L=2 for MECH226); M = Mark (%).

The summation terms must include **all** subject attempts (including any failures). The grades of honour are then awarded as follows:

First Class honours: 77.5 < WAM < 100

Second Class, Division 1 honours: 72.5 < WAM < 77.5

Second Class, Division 2 honours: 67.5 < WAM < 72.5

## **Scholars Program**

Those students who maintain a WAM greater than 80 are eligible for the Scholars Program, which has benefits including the following:

- Scholars are eligible to take the 18 credit point Final Year Thesis option (MMMB499 or ECTE499). In this project you can undertake a significant research activity that will help in providing the best possible platform for you to launch your career as a Professional Engineer following graduation.
- Final year Scholars may be given the opportunity to act as paid student mentors to first year students in the Opportunity Program. This not only gives you some extra cash, but also improves your understanding of your own discipline, since the best way to understand a subject is to explain it to someone else.
- Scholars are encouraged to discuss their study program with the Head of Students with a view to arranging a customised study program to suit a student's particular interests and abilities. For instance, we would encourage scholars to consider taking high-level analytical subjects (possibly at postgraduate level) from Mechanical Engineering, Electrical Engineering and other Engineering/Science disciplines and in Mathematics (which is particularly important for those students considering a career in research or academia).
- Some research based subjects (ENGG171, ENGG271 and ENGG371) have been introduced as options for students in the Scholars Program. Proposals to undertake these subjects should be discussed with the Head of Students.

## **Professional Experience**

If you are in the 2nd or 3rd year of your degree, 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 enroll in ENGG454 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 be completed at the latest 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). The possible placement opportunities are posted on EIS PEXs notice boards or distributed by email. The student must follow process, starting with student enrolment and finishing with the discipline coordinator marking the student's final report, in EIS PEXs.

Remember if you are in 2nd or 3rd year in 2022 – apply for Professional Experience positions early. (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, to ensure that it meets the relevant criteria. It is important that the suitability of the position is confirmed in advance to avoid the considerable difficulty and disappointment that arises if your 12 week work experience does not meet the requirements.

Contact: Associate Professor Hongtao Zhu via email on [hongtao@uow.edu.au](mailto:hongtao@uow.edu.au).

Engineers Australia is our Professional Body and you can join as a student member and get many benefits and significant assistance. Being certified as a professional engineer by this body may be

essential for your career, so it is a good idea to get involved early. For more information please go to <http://www.engineersaustralia.org.au/>.

I would like to take this opportunity to draw your attention to the Mechatronic Engineering Student Society (TRONSOC) (<https://m.facebook.com/UowMechatronicsSociety/>). The society has a wide range of activities over the course of the year. It is a place where you may interact with other mechatronic engineering students from different years. I encourage you all to join the society and support its activities throughout 2022. The following two senior mechatronic students are available to answer your inquiries.

- President: Adem Benten [ab769@uowmail.edu.au](mailto:ab769@uowmail.edu.au)
- Vice President: Johathan Chan [jc291@uowmail.edu.au](mailto:jc291@uowmail.edu.au)

In closing I would like to join with all academic and support staff in wishing you the very best and I look forward to seeing you again.

**Associate Professor Stephen (Zengxi) Pan**

*Academic Program Director -- Mechatronic Engineering*

*School of Mechanical, Materials, Mechatronic & Biomedical Engineering*

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## **721 / 730 Superseded BE (Mechatronic) DEGREE – Full Time Programme**

<b>Autumn Session</b>	<b>Spring Session</b>
<b>1<sup>st</sup> Year</b>	
<ul style="list-style-type: none"> <li>• CSCI191 Engineering Programming 1</li> <li>• ENGG101 Foundations of Engineering</li> <li>• ENGG153 Engineering Materials</li> <li>• MATH141 Mathematics 1C Part 1 <b><u>OR</u></b></li> <li>• MATH 187 Mathematics 1A Part 1</li> </ul>	<ul style="list-style-type: none"> <li>• ECTE172 Introduction to Cir. and Devices</li> <li>• ENGG152 Engineering Mechanics</li> <li>• ENGG154 Engineering Design and Innovation</li> <li>• MATH142 Mathematics 1C Part 2 <b><u>OR</u></b></li> <li>• MATH188 Mathematics 1A Part 2</li> </ul>
<b>2<sup>nd</sup> Year</b>	
<ul style="list-style-type: none"> <li>• ECTE233 Digital Hardware 1</li> <li>• ENGG251 Mechanics of Solids</li> <li>• MATH283 Mathematics 2E for Engineers Part 1</li> </ul>	<ul style="list-style-type: none"> <li>• PHYS143 Fundamentals of Physics B</li> <li>• ECTE203 Signals and Systems</li> <li>• MECH215 Fundamentals of Machine Component Design</li> <li>• MECH226 Machine Dynamics</li> </ul>
<ul style="list-style-type: none"> <li>• ECTE202 Circuits and Systems (4 cpt Autumn, 2 cpt Spring)</li> </ul>	
<b>3<sup>rd</sup> Year</b>	
<ul style="list-style-type: none"> <li>• ECTE344 Control Theory</li> <li>• MECH252 Engineering Experimentation and Thermodynamics</li> <li>• ENGG252 Engineering Fluid Mechanics</li> </ul>	<ul style="list-style-type: none"> <li>• MECH311 Mechanical Engineering Design</li> <li>• ECTE212 Electronics</li> <li>• ECTE324 Foundations in Power Engineering</li> </ul>
<ul style="list-style-type: none"> <li>• ECTE333 Digital Hardware 2</li> <li>• ECTE351 Engineering Design and Management 3</li> </ul>	
<b>4<sup>th</sup> Year</b>	
<ul style="list-style-type: none"> <li>• ENGG461 Management and Human Factors in Engineering</li> <li>• ECTE301 Digital Signal Processing 1</li> <li>• MECH382 Manufacturing Engineering Principles</li> </ul>	<ul style="list-style-type: none"> <li>• ECTE471 Robotics and Flexible Automation</li> <li>• Elective</li> <li>• Elective (only if ENGG452 is taken for Thesis)</li> </ul>
<ul style="list-style-type: none"> <li>• ENGG456 Project A (6 CP) or</li> <li>• ENGG457 Project B (6 CP) or</li> <li>• ENGG452 Thesis A (12 CP) or</li> <li>• ENGG453 Thesis B (18 CP) or</li> <li>• ECTE451 Project (6 CP) or</li> <li>• ECTE458 Thesis (12 CP)</li> <li>• ENGG454 Professional Experience (0 cpt)</li> </ul>	

## 1856 BE (Mechatronic) DEGREE – Full Time Programme

Autumn Session	Spring Session
<b>1<sup>st</sup> Year</b>	
<ul style="list-style-type: none"> <li>• ENGG102 Fundamentals of Engineering Mechanics</li> <li>• ENGG103 Materials in Design</li> <li>• ENGG105 Engineering Design for Sustainability</li> <li>• MATH141 Foundations of Engineering Mathematics*</li> </ul>	<ul style="list-style-type: none"> <li>• ENGG100 Engineering Computing and Analysis</li> <li>• ENGG104 Electrical Systems</li> <li>• PHYS143 Principles of Physics for Engineers</li> <li>• MATH142 Essentials of Engineering Mathematics*</li> </ul>
<b>2<sup>nd</sup> Year</b>	
<ul style="list-style-type: none"> <li>• ECTE233 Digital Hardware 1</li> <li>• ENGG251 Mechanics of Solids</li> <li>• MATH283 Mathematics 2E for Engineers Part 1</li> <li>• CSCI291 C programming</li> <li>• MECH203 Mechanical Engineering Practices (0 CP)</li> </ul>	<ul style="list-style-type: none"> <li>• MECH252 Thermodynamics, Experimental Methods and Analysis</li> <li>• ECTE203 Signals and Systems</li> <li>• MECH215 Fundamentals of Machine Component Design</li> <li>• MECH226 Machine Dynamics</li> </ul>
<b>3<sup>rd</sup> Year</b>	
<ul style="list-style-type: none"> <li>• ECTE202 Circuits and Systems</li> <li>• MECH382 Manufacturing Engineering Principles</li> <li>• ENGG252 Engineering Fluid Mechanics</li> </ul>	<ul style="list-style-type: none"> <li>• MECH311 Mechanical Engineering Design</li> <li>• ECTE212 Electronics</li> <li>• ECTE344 Control Theory</li> </ul>
<ul style="list-style-type: none"> <li>• ECTE351 Engineering Design and Management</li> </ul>	
<b>4<sup>th</sup> Year</b>	
<ul style="list-style-type: none"> <li>• ENGG461 Managing Engineering Projects</li> <li>• ECTE333 Microcontroller Architecture and Applications</li> <li>• Elective</li> </ul>	<ul style="list-style-type: none"> <li>• ECTE471 Robotics and Flexible Automation</li> <li>• MECH470 Applied Topics in Mechatronics</li> <li>• Elective (only if MMMB498 or ECTE498 is taken for Thesis)</li> </ul>
<ul style="list-style-type: none"> <li>• MMMB498 (12 CP) or MMMB499 (18 CP) or</li> <li>• ECTE498 (12 CP) or ECTE499 (18 CP)</li> <li>• ENGG454 Professional Experience (0 cpt)</li> </ul>	

### REMARKS

- Annual subjects run both in Autumn and Spring Sessions and are unless mentioned otherwise 3 cpt in Autumn session and 3 cpt in Spring session.
- Required total number of credit points = 192.
- Students must enrol in MECH203 (Mechanical Engineering Practices) in 2nd year Autumn Session. MECH203 is a zero credit point subject. It is a prerequisite of MECH215.
- Students must complete 12 weeks of approved and certified Professional Experience (ENGG454) – Students should enrol in ENGG454 for either the session in which they wish to submit their report or for the last session of their degree.
- MMMB498 (previously ENGG452) and ECTE498 (previously ECTE456) Thesis A is a 12 credit point annual subject. Students undertaking the 12 credit point thesis will be required to complete two electives (either both from list A or one from list A plus the other from list B).
- MMMB499 (previously ENGG453) Thesis B, will be available to students in the Scholars Program (i.e students with a WAM>80). Students who take MMMB499 or ECTE499 will just need to complete one elective from either list A or list B.
- Students may commence their thesis in Spring Session if they wish (see the Thesis Coordinators, A/Prof Andrzej Calka: acalka@uow.edu.au, or Dr Peter Vial: peter\_vial@uow.edu.au, for further details).
- **Note:** some students may wish to enrol in subjects from other Disciplines/Faculties. However, this can only be done after first gaining written approval from the Head of Students by applying in writing with reasons/justification as to why the student wishes to take a subject external to the Faculty of Engineering and Information Sciences. Subjects taken from other departments must not duplicate any material already present in the above program.
- The final year study program is to be determined in consultation with the Academic Program Director.
- The 2022 handbook link: <https://courses.uow.edu.au/aos/2022/MAJ40172?year=2022>.

**The list of electives acceptable in the program not all electives are offered in 2022, please check UOW timetable)**

**List A**

<i>Subject</i>	<i>Name</i>	<i>Credit points</i>
MECH419	Finite Element Methods in Engineering	6
MECH468	Computer control of machines and process	6
MECH409	Micro/Nano Robotic Systems	6
MECH431	Computational fluid dynamics	6
ECTE213	Engineering Electromagnetics	6
ECTE324	Power Engineering	6
ECTE363	Communication Systems	6
ECTE401	Multimedia Signal Processing	6
ECTE433	Embedded Systems	6
ENGG433	Financial Management for Engineers	6
ENGG434	Intro to Materials Welding and Joining	6
ENGG447	Advanced building design for energy efficiency and sustainability	6
ENGG434	Introduction to Materials Welding and Joining	6
ENGG378	Sustainable Energy Technologies	6
ENGG439	Engineering logistics and operations management	6
MECH372	Solids handling and process engineering	6
MECH421	Manufacturing Process Analysis	6
MECH423	Design for manufacturing	6
MECH474	Reliability Engineering	6
ECTE427	Renewable and Embedded Generation	6
ECTE432	Computer architecture	6
ECTE441	Intelligent Control	6
ECTE442	Computer Controlled Systems	6
ECTE465	Wireless Communication Systems	6
ECTE431	Real-time computing	6
BMEG302	Biomedical sensors and actuators	6
BMEG304	Manufacturing techniques for biomedical engineering	6
HUMA272	Humanitarian studies	6

**List B**

<b><i>Subject</i></b>	<b><i>Name</i></b>	<b><i>Credit points</i></b>
BMS112	Human physiology 1: principles and systems	6
ECON101	Macroeconomic essentials for business	6
ECON111	Introductory microeconomics	6
ERLS100	Introduction to employment relations and labour studies	6
FREN151	French 1A language	6
INDO151	Introductory Indonesian 1A	6
INTS375	Global labour studies	6
ITAL151	Italian 1A language	6
JAPA141	Beginner's Japanese 1	6
LAW101	Law, business and society	6
MAND151	Chinese (Mandarin) for Beginners 1A	6
PHIL206	Practical Ethics	6
PHIL256	Ethics and the Environment	6
PHIL295	Astronomy-Concepts of the universe	6
SPAN151	Spanish for beginners 1	6
STS218	Environment in Crisis	6
STS300	The Environmental Context	6

**Mechatronic Bachelor of Engineering Degree MAP 2022**

