

School of Mechanical, Materials, Mechatronic and Biomedical Engineering

26st October 2022

INFORMATION FOR MECHANICAL ENGINEERING STUDY PROGRAM IN 2023

Dear Mechanical Engineering Students,

I hope 2022 was a successful and rewarding year for you, especially now that we have seen a lot more classes returning to campus, and that you are or will be enjoying the break away from university, whether you are spending time with family, on vacation or working (perhaps doing your professional experience). If you struggled or did not perform as well as you had hoped or below what you know you are capable of, let me encourage you to review what you would do differently to improve in 2023. You are most welcome to arrange a meeting with me if you need advice on any matters regarding your study. Also do not forget that the university has a wide range of support services available for you, if you feel that you need to speak with someone with specific expertise about your specific situation.

The primary purpose of this letter is to let you know of some of the study program arrangements and changes for 2023 – please keep this letter for future reference.

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. MECH203 is a **prerequisite for MECH215** and is **only on offer in Autumn Session**. Skills developed, including documentation of your practical engineering experience will assist with attaining work experience placements. **You must complete MECH203 in the Autumn session prior to taking MECH215 in the Spring session.** 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. David Hastie, dhastie@uow.edu.au

Mechanical Engineering Design 2 (MECH311)

For any students planning on enrolling in MECH311 in 2023, I would highly recommend that if at all possible, try to avoid enrolling in the same year as you enroll in your thesis (MMMB498/MMMB499). MECH311 is a cornerstone subject of the Mechanical Engineering degree and as such, requires suitable time to dedicate to this subject (along with the others you are enrolled in of course). In some situations it is unavoidable that both subjects are taken at the same time and that is completely understandable and definitely still allowed.

Enquiries: Dr. David Hastie, dhastie@uow.edu.au

Thesis selection

Students have a choice of enrolling in MMMB498 Thesis A (12 credit points), MMMB499 Thesis B (18 credit points). Those with high WAM (75 or above) have the option of enrolling in MMMB499 Thesis B (18 credit points) and Scholars students must enrol in MMMB499. Please refer to paragraph "Weighted Average Mark (WAM) below for more information on how to calculate WAM. In an MMMB499 thesis, 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. ENGG456 is no longer offered.

Theses can be experimental, theoretical, simulation, design, industry based or combinations of anything in between.

In the session prior to the intended commencement of your thesis, it is highly advised that you:

1. Think about the subjects you have enjoyed or have done well in and engineering topics that you have an interest in.
2. Speak to academics in your discipline (email to discuss or arrange a face to face meeting) about what topics they might have on offer for next year and the requirements of those.
3. If you come to an agreement with your potential supervisor regarding your thesis topic, then please send an email containing your student number, thesis topic and supervisor name to the thesis coordinator by week 1 of the session you intend to commence your thesis.
4. If you have a topic confirmed with a supervisor, your selection process is complete.

Electives

Links to the list of engineering electives on offer this year can be found on Page 7 of this document.

We continue to offer a range of elective subjects which reflect the broad range of career opportunities in Mechanical Engineering and which also reflect the strengths of the Mechanical Engineering Discipline at the University of Wollongong (e.g. applied mechanics, bulk materials handling, manufacturing, sustainable energy technologies, dynamics, maintenance engineering and management, engineering asset management and reliability engineering).

The electives that are acceptable in the program are grouped in two different lists.

List A: 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 two (2) electives 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 Academic Program Director before taking that subject and have that subject approved in writing by the undergraduate Head of Students (HoST) as counting towards your degree. Available electives vary from year to year and are dependent on staff availability.

Note 1: Regardless of which year you commenced your degree, you can choose electives based on what is available when you need to enrol in an elective subject.

Note 2: Not all electives run every year, so check the online course handbook carefully.

Minors

Combining electives into a common theme can result in you qualifying for obtaining a minor within your engineering major. There are minors within engineering or across all other faculties. Planning for this should start early in your degree so you can make full use of your electives. Also note that one core subject can count towards a minor. The majority of minors are 24 credit points, but there are others with 30 and 36 credit points. Follow the link below for a full list of currently available minors. Note: use the filters in the left hand menu and make sure you search based on 2023.

<https://courses.uow.edu.au/search?ct=aos&level=minor>

Enquiries: Dr. David Hastie, dhastie@uow.edu.au

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.** Please note that in 2023 there will be even more expectation for student to return to campus and as such, there will be less options available for online classes.

Weighted Average Mark (WAM)

WAM is the weighted average mark from *every* subject you have attempted over the whole of 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 WAM using the following formula:

$$WAM = \frac{\sum MLC}{\sum LC}; \text{ where } C = \text{credit point value of subject; } L = \text{Level (i.e. } L=2 \text{ for MECH226);}$$

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: $67.5 < WAM < 72.5$

The Third Class honours grade will no longer be awarded (previously for $62.5 < WAM < 67.5$)

Pass Degree: $WAM < 67.5$

Scholars Program

Those students who maintain a WAM greater than 80 (*NB this is a change from the previous requirement of 75*) 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 Thesis B). Final year Scholars students 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 students are encouraged to discuss their study program with the Scholars Academic Program Director 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, 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 Scholars Academic Program Director.

Enquiries: Dr. David Hastie, dhastie@uow.edu.au

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. Some industry often prefer to employ students in the early stages of the degree program. There are strict rules for the type and duration of work that is eligible to be claimed as professional experience.

There is a requirement that 12 weeks of professional experience be completed satisfactorily 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). You need to enroll in ENGG454 in the session that you intend to submit the report for this professional experience. Ideally this work experience would be completed between years 3 and 4, however you should also consider taking advantage of any suitable opportunities earlier. It is *your* responsibility to find Professional Experience work.

Remember if you are in 2nd or 3rd year in 2023 – **apply for Professional Experience positions early**. 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.

An information pack detailing the requirements for ENGG454 (including forms that need to be completed by prospective employer and the ENGG454 coordinator before the work placement commences) are available from the EIS enquiry centre, building 4. From time to time there may be

some information on possible placement opportunities posted on the notice boards or distributed by email. Enquiries: A/Prof Hongtao Zhu hongtao@uow.edu.au

Mechanical Engineering Society

I would like to take this opportunity to draw your attention to several engineering groups/teams.

The Mechanical Engineering Society (<https://www.facebook.com/uowmechsoc>)

The society has a wide range of activities over the course of the year. It is a place where you may interact with other mechanical engineering students from different years. I encourage you all to join the society and support its activities throughout 2023.

Engineers Australia

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/>

UOW Motorsport

UOW Motorsport is a student led program which has been competing in the Australasian FSAE competition since 2001. UOW Motorsport has been very successful over the years, winning the world championships in 2002 and the Australasian competition in 2016 alongside several other podium finishes. Winning is a great additional outcome to the tremendous learning experience offered by this activity. UOW Motorsport is about designing and building an open-wheel race car to a very high quality, developing and executing a business plan, working in a multidisciplinary team environment with very high ethical standards and much more.

Enquiries: Dr Philip Commins – Faculty Advisor, pcommins@uow.edu.au

Engineering Software

With the advances in the computational techniques and available free for engineering students version of the software, computational tools have become more and more important skills that modern engineers will need to know. In the program you will be exposed to these various tools. I encourage you to start exploring these tools on your own as early as possible – perhaps over the summer break.

ANSYS CFD and Mechanical – contact A/Prof. Buyung Kosasih, buyung@uow.edu.au

MATLAB (install at home) – contact dhastie@uow.edu.au

AUTOCAD INVENTOR – contact buyung@uow.edu.au

To assist you in finding out where you are in your degree program, I have also attached *degree maps* for full-time and part-time programs illustrating how all the subjects are linked by pre- and co-requisites and some examples of links for prior knowledge.

In closing I would like to join with all academic and support staff in wishing you the very best for 2022 - we look forward to seeing you again.

D Hastie

Dr. David Hastie

*Academic Program Director – Undergraduate Mechanical Engineering,
School of Mechanical, Materials, Mechatronic and Biomedical Engineering
(Room 8.113, Ph: 4221 5822, email: dhastie@uow.edu.au)*

BE Honours (Mechanical) DEGREE - FULL TIME PROGRAMME

Autumn Session	Spring Session
First Year ENGG105 Engineering Design for Sustainability ENGG102 Fundamentals of Engineering Mechanics ENGG103 Materials in Design MATH141 Foundations of Engineering Mathematics*	ENGG104 Electrical Systems ENGG100 Engineering Computing and Analysis MATH142 Essentials of Engineering Mathematics* PHYS143 Principles of Physics for Engineers
Second Year ENGG252 Engineering Fluid Mechanics ENGG251 Mechanics of Solids CHEM103 Introductory Chemistry for Engineers MATH283 Mathematics 2E Part 1 MECH203 Mechanical Engineering Practice	MECH215 Fundamentals of Machine Component** Design MECH226 Machine Dynamics MECH252 Thermodynamics, Experimental Methods and Analysis MECH201 Engineering Analysis
Third Year MECH321 Dynamics of Engineering Systems MECH341 Thermodynamics MECH382 Manufacturing Engineering Principles MECH326 Dynamics of Mechanism	MECH311 Mechanical Engineering Design MECH343 Heat Transfer & Aerodynamics MECH365 Control of Machines & Processes MECH372 Solids Handling and Process Engineering
Fourth Year MMMB498/9 Thesis A or B ENGG461 Managing Engineering Projects MECH419 Finite Element Methods in Engineering MECH4xx Elective	MMMB498/9 Thesis A or B MECH4xx Elective MECH4xx Elective MECH4xx Elective

- Required total number of credit points = 192 (32 Subjects)
- *MATH187/188 is available as an alternative for some students entering with a high level of mathematics.
- Students **must complete MECH203** (Mechanical Engineering Practice) prior to commencing MECH215. MECH203 is a zero credit point, zero HECs charge subject. Recognition of prior learning for **some** components of this subject may be approved by the subject coordinator following enrolment and written application.
- Students must complete 12 weeks of approved and certified Professional Experience (ENGG454) – students should enroll in ENGG454 for either the session in which they wish to submit their report or for the last session of their degree. ENGG454 is a zero credit point, zero HECs charge subject.
- MMMB498 Thesis A is a 12-credit point annual subject. A similar 18-credit point subject, MMMB499 Thesis B, will be available to students in the Scholars Program (i.e. students with WAM>75.0). Scholars will take one less elective. Students may commence their thesis in Spring Session if they wish.

1856 BE (Mechanical) DEGREE - PART TIME PROGRAMME

Stage	Autumn Session		Spring Session		CP
1	MATH141 ENGG103	Foundations of Engineering Mathematics* Materials in Design	MATH142 PHYS143	Essentials of Engineering Mathematics* Principles of Physics for Engineers	24
2	ENGG102 ENGG105	Fundamentals of Engineering Mechanics Engineering Design for Sustainability	ENGG104 ENGG100	Electrical Systems Engineering Computing and Analysis	24
3	ENGG251 MATH283	Mechanics of Solids Mathematics IIE Part 1	MECH215 MECH226	Fundamentals of Machine Component Design Machine Dynamics	24
4	CHEM103 ENGG252 ENGG255	Introductory Chemistry for Engineers Engineering Fluid Mechanics Professional Option 2	MECH201 MECH252 ENGG255	Engineering Analysis Thermodynamics, Experimental Methods and Analysis Professional Option 2	30
5	MECH341 MECH321 ENGG355	Thermodynamics Dynamics of Engineering Systems Professional Option 3	MECH343 MECH365 ENGG355	Heat Transfer & Aerodynamics Control of Machines and Processes Professional Option 3	30
6	MECH382 MECH326 ENGG455	Manufacturing Engineering Principles Dynamics of Mechanism Professional Option 4	MECH311 MECH372 ENGG455	Mechanical Engineering Design Bulk Solids Handling Technology Professional Option 4	30
7	MMMB498/9 ENGG461 MECH419	Thesis A/B Managing Engineering Project Finite Element Methods in Engineering	MMMB498/9 MECH4xx	Thesis A/B Elective	30

- Total number of credit points = 192.
- *MATH187/188 available as an alternative for some students with a high level of mathematics on entry.
- Each six-credit point Professional Option subject is credited as one elective - up to a maximum of 3 electives.
- Students must complete MECH203 (Mechanical Engineering Practice) prior to commencing MECH215. MECH203 is a zero credit point, zero HECs charge subject. Recognition of prior learning for **some** components of this subject may be approved by the subject coordinator following enrolment and written application.
- Students must complete 12 weeks of approved and certified **Professional Experience** (ENGG454) – students should enroll in ENGG454 for either the session in which they wish to submit their report or for the last session of their degree. Students who complete at least one Professional Option are not required to complete ENGG454. ENGG454 is a zero credit point, zero HECs charge subject.
- MMMB498 Thesis A is a 12-credit point annual subject. A similar 18-credit point subject, MMMB499 Thesis B, will be available to students in the Scholars Program (i.e. students with WAM>75.0). Scholars will take one less elective.
- Students may commence their thesis in Spring Session if they wish (contact the Thesis Coordinator for further details).

The full list of electives acceptable in the program

NOTE: The course handbook has changed format this year and will require some time to get used to the new navigation process. It is advised that you bookmark relevant pages in your internet browser to save time in the future.

NOTE: not all electives are offered in 2023, please check the UOW Course Handbook for their availability and the session an elective is delivered

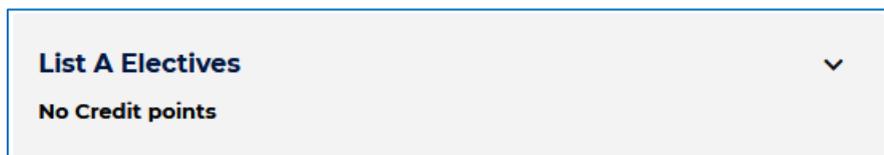
List A

The subjects provided in List A are the standard engineering technical electives. You would normally do 4 subjects from this list to complete the requirements for your BE (Mech) degree.

The List A elective subjects are listed in the following link:

<https://courses.uow.edu.au/aos/2023/MAJ40192>

and then scroll down to the expandable box



List B

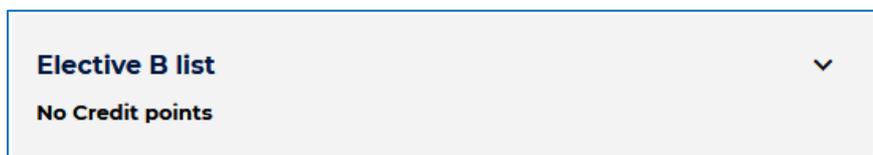
It is possible, however, to have up to 2 subjects selected from outside the standard program to count towards the 192 credit points required for your degree (List B).

Up to two (2) external subjects (from List B) may be taken by full time students in lieu of electives in the Mechanical Engineering program in List A (part-time students who complete one or more professional options may complete only one (1) external subject). The subjects presented in List B are pre-approved as eligible electives. If you identify a subject that you wish to take that is not on List B, you must first obtain written approval from the Head of Students by applying in writing with reasons/justification as to why you wish to take a subject external to the list above. Failure to do this may result in delay in graduation and added expense. This opportunity is available so that students can broaden their education and/or extend their technical skill and knowledge bases in inter-disciplinary studies. Subjects taken from other departments must not duplicate any material already present in the above program. Discussing your plans with the discipline advisor would be a good first step before making an application to the EIS undergraduate Head of Students (HoST) via EIS Central.

The list B elective subjects are listed in the following link:

<https://courses.uow.edu.au/courses/2023/1856>

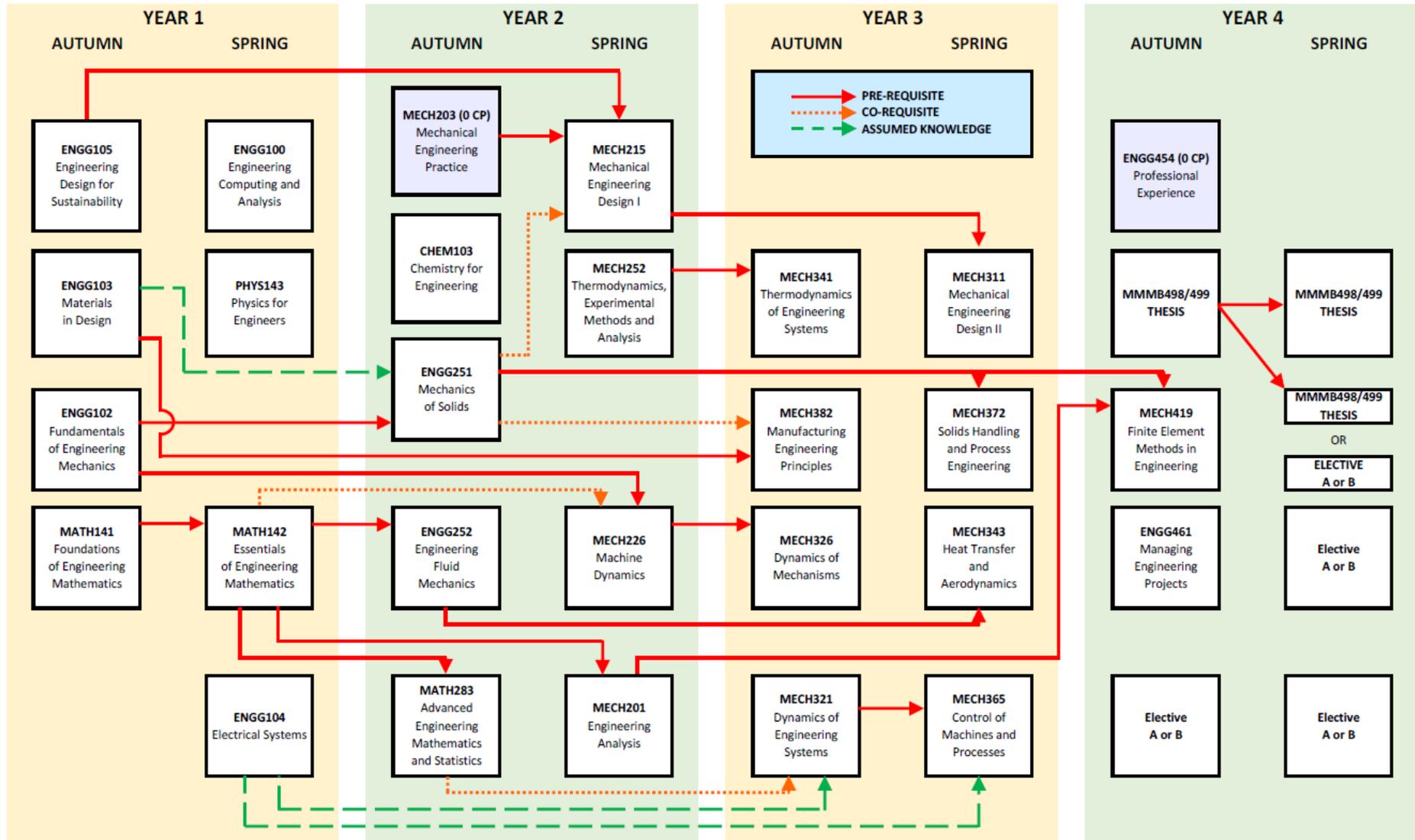
and then scroll down to the expandable box



List of Advisers / Coordinators

Matters	Academics
Professional work experience / Professional options	A/Prof. Hongtao Zhu
Thesis	Dr. Zhixin Chen
Mechanical Discipline & Scholars	Dr. David Hastie

BACHELOR OF ENGINEERING HONOURS (MECHANICAL)



A MINOR IN ANOTHER DISCIPLINE REQUIRES AT LEAST 24 CP, ONE OF WHICH CAN BE A CORE SUBJECT FROM YOUR DEGREE. YOU THEN USE YOUR ELECTIVES TO ACCOUNT FOR THE OTHERS. REFER TO THE COURSE HANDBOOK FOR APPROVED MINORS OR CONTACT THE UNDERGRADUATE HEAD OF STUDENTS VIA [ASKUOW](#) TO MAKE AN APPOINTMENT TO DISCUSS FURTHER.

MMMB498 + FOUR ELECTIVES
 MMMB499 + THREE ELECTIVES
 LIST B ELECTIVES : MAXIMUM OF TWO