

**School of Mechanical, Materials and Mechatronic Engineering**11<sup>th</sup> January 2012**INFORMATION FOR MECHANICAL ENGINEERING STUDY PROGRAM IN 2012**

Dear Mechanical Engineering Student

I hope 2011 was a successful and rewarding year for you and that you are enjoying the break away from university, whether you are on vacation or working (perhaps doing your professional experience at the end of third or fourth year).

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

**There are minor changes in the thesis selection.**

“From 2010 onwards students have a choice of enrolling in ENGG452 Thesis A (12 credit points) or ENGG456 Project A (6 credit points). Students who enrol in ENGG456 will be required to take an additional elective from the list of approved electives as listed for their degree. The project is intended for students who do not expect to get an Honours degree, and would like to broaden their study program. High achieving students will continue to have the option of enrolling in ENGG453 Thesis B (18 credit points). Note: to be eligible for Honours, students must complete either ENGG452 Thesis A (12 credit points) or ENGG453 Thesis B (18 credit points), in addition to having achieved the required WAM score. Please consult your Discipline Advisor if you have any questions about the new projects or honours.”

**Electives.** We will 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 (eg Applied Mechanics, Bulk Materials Handling, Manufacturing, Sustainable Energy Technologies). The electives that 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 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 Discipline Advisor before taking that subject and have that subject approved in writing by the Sub Dean 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 2012 and 2013 is provided below (page 6).

**Timetabling.** Details of the timetable and room allocations can be found on the web. Note that with the university-wide timetabling software, *timetables are likely to change up until close to the start of semester – it is important that you check this information as the semester approaches.*

**Pass Conceded Grade:** From January 2012, the PC and PR grades will no longer be available. There will be a system established where students who are close to a pass grade may be offered a supplementary assessment.

The following link contains further information on this change:

<http://www.uow.edu.au/about/policy/alphalisting/UOW112434.html>

**Pass Conceded limit.** I expect that the pass conceded limit will remain in order to meet graduation requirements. Please remember that there is a limit on the number of PC grades that you may have at graduation. The course rule 8.5.4 states “Subjects satisfactorily completed at a Pass Conceded or Pass Restricted grade may comprise no more than one sixth of the minimum credit point value of a course.” – if you exceed this limit (32 credit points – i.e. *if you have more than 5 subjects as PC*) you will have to retake one or more subjects (see the university handbook/website for more details).

**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:

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

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 (ENGG453 Thesis B). 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 Sub-Dean 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 Sub-Dean.

**Professional Experience.** As you are no doubt aware there is a requirement that 12 weeks of professional experience be completed satisfactorily as part of the Bachelor of Engineering degree program (a requirement from the Institution of Engineers as part of the accreditation of the course). This is included in the course as the ENGG454 subject (zero credit points), in which you should enroll, 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. Your graduation will be delayed until this component is complete, hence if it is left to the end of 4th year, you will be unable to graduate in the December graduation ceremony of that year. It is *your* responsibility to find Professional Experience work. The Engineers Australia office (ground floor Building 8 may be able to give you a list of possible local companies).

Remember if you are in 3<sup>rd</sup> year in 2012 – ***apply for Professional Experience positions early*** (put it in your diary to apply for posts early in Spring Semester – 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 Devi Saini) to ensure that it meets the relevant criteria. An information pack detailing the requirements for ENGG454 (including forms that need to be completed by prospective employer and the ENGG454 coordinator) are available from the Engineering Enquiries Centre. From time to time there may be some information on possible placement opportunities posted on the notice boards or distributed by email. Engineers Australia is our Professional Body and you can join as a student member and get many benefits and significant assistance. Eventually you will be certified as a professional engineer by this body so it is a good idea to get involved early on. See Elaine Bailey in the Engineers Australia Office on the ground floor of Building 8.

To assist you in finding out where you are in your degree program, I have also attached a copy of a *degree map* illustrating how all the subjects are linked by pre- and co-requisites and some examples of links for prior knowledge. *If you have any doubt at all about your program for 2011 please contact me.*

I would like to take this opportunity to draw your attention to the Mechanical Engineering Society. 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 2012.

In closing I would like to join with all academic and support staff in wishing you the very best for the New Year - we look forward to seeing you again in 2012.



**Dr Oliver Kennedy**

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### 2012 BE (Mechanical) DEGREE - FULL TIME PROGRAMME

*(Each subject listed = 6 Credit Points/semester)*

Autumn Session	Spring Session
<b>First Year</b> ENGG101 Foundations of Engineering ENGG153 Engineering Materials MATH141 Foundations of Engineering Mathematics* CHEM103 Chemistry for Engineers	ENGG152 Engineering Mechanics ENGG154 Engineering Design and Innovation MATH142 Essentials of Engineering Mathematics* PHYS143 Principles of Physics for Engineers
<b>Second Year</b> ENGG252 Engineering Fluid Mechanics ENGG251 Mechanics of Solids MECH252 Engineering Experimentation and Thermodynamics MATH283 Mathematics 2E Part 1	MECH215 Fundamentals of Machine Component Design MECH226 Machine Dynamics ECTE290 Fundamentals of Electrical Eng. MECH201 Engineering Analysis
<b>Third Year</b> MECH321 Dynamics of Engineering Systems MECH341 Thermodynamics MECH372 Solids Handling and Process Engineering MECH382 Manufacturing Engineering Principles	MECH311 Mechanical Engineering Design MECH343 Heat Transfer & Aerodynamics MECH365 Control of Machines & Processes ENGG361 Project and Business Management
<b>Fourth Year</b> ENGG452 Thesis A or ENGG456 ENGG461 Management and Human Factors in Engineering MECH419 Finite Element Methods in Engineering MECH4xx Elective	ENGG452 Thesis A or MECH4xx Elective MECH4xx Elective MECH4xx Elective MECH4xx Elective

- Required total number of credit points = 192
- \*MATH187/188 is available as an alternative for some students entering with a high level of mathematics.
- 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.
- ENGG452 Thesis A is a 12-credit point annual subject. A similar 18-credit point subject, ENGG453 Thesis B, will be available to students in the Scholars Program (ie students with WAM>75.0). Scholars will take one less elective. Students may commence their thesis in Spring Session if they wish (see the Thesis Coordinator for further details).
- MECH419 is an elective subject for students who commenced the course prior to 2009; it is a core subject for all other students.

## 2012 BE (Mechanical) DEGREE - PART TIME PROGRAMME

*(Each subject listed = 6 Credit Points/semester)*

Stage	Autumn Session	Spring Session	CP
1	MATH141 Foundations of Engineering Mathematics* ENGG101 Foundations of Engineering	MATH142 Essentials of Engineering Mathematics* PHYS143 Principles of Physics for Engineers	24
2	CHEM103 Chemistry for Engineers ENGG153 Engineering Materials	ENGG152 Engineering Mechanics ENGG154 Engineering Design and Innovation	24
3	MECH252 Engineering Experimentation and Thermodynamics ENGG251 Mechanics of Solids	MECH215 Fundamentals of Machine Component Design MECH226 Machine Dynamics	24
4	ENGG252 Engineering Fluid Mechanics MATH283 Mathematics IIE Part 1 ENGG255 Professional Option 2	MECH201 Engineering Analysis ECTE290 Fundamentals of Electrical Eng ENGG355 Professional Option 2	30
5	MECH341 Thermodynamics MECH321 Dynamics of Engineering Systems  ENGG355 Professional Option 3	MECH343 Heat Transfer & Aerodynamics MECH365 Control of Machines and Processes ENGG355 Professional Option 3	30
6	MECH372 Bulk Solids Handling Technology MECH382 Manufacturing Engineering Principles ENGG455 Professional Option 4	MECH311 Mechanical Engineering Design ENGG361 Project and Business Management ENGG455 Professional Option 4	30
7	ENGG452 Thesis ENGG461 Management and Human Factors in Engineering MECH419 Finite Element Methods in Engineering	ENGG452 Thesis MECH4xx 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 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. Students who complete at least one Professional Option are not required to complete ENGG454.
- ENGG452 Thesis A is a 12-credit point annual subject. A similar 18-credit point subject, ENGG453 Thesis B, will be available to students in the Scholars Program (ie students with WAM>75.0). Scholars will take one less elective. Students may commence their thesis in Spring Session if they wish (see the Thesis Coordinator for further details).

## **The list of electives acceptable in the program.**

### **List A**

CIVL311	Structural Design 1
CIVL314	Structural Design 2
CIVL322	Hydraulics and Hydrology
CIVL463	Applied Geotechnical Engineering
ECTE471	Robotics and Flexible Automation
ENGG378	Sustainable Energy Technologies
ENGG433	Financial management for Engineers
ENGG434	Introduction to Materials Welding and Joining
ENGG477	Ocean Engineering
ENVE221	Air and Noise Pollution Control Engineering
MATE302	Polymeric Materials
MATE401	Selection of Materials in Engineering Design
MECH409	Micro/Nano Robotic Systems
MECH421	Manufacturing Process Analysis
MECH422	Design and Analysis of Manufacturing Systems
MECH423	Design for Manufacturing
MECH424	Managing Manufacturing Activities
MECH426	Storage and Flow of Bulk Solids
MECH427	Mechanical Conveying of Bulk Solids
MECH428	Pneumatic Conveying and Dust Control
MECH429	Physical Processing of Bulk Solids
MECH430	Automotive Dynamics
MECH431	Computational Fluid Dynamics
MECH438	Fluid Power
MECH442	Sustainable Energy in Buildings
MECH468	Computer Control of Machines and Processes
MECH474	Reliability Engineering
MECH479	Sustainable Transport & Engine Technologies
MECH487	Systems Analysis for Maintenance Management
MECH488	Introduction to Condition Monitoring in Mechanical Engineering
MECH489	Engineering Asset Management

### **LIST B**

BMS112	Human Physiology 1: Principles and Systems
ECON101	Macroeconomic Essentials for Business
ECON111	Introductory Microeconomics
ECTE233	Digital Hardware 1
ERLS100	Intro. To Employment Relations and Labour Studies
FREN151	French 1A Language
INDO151	Introductory Indonesian 1A
INTS375	Global Labour Studies
ITAL151	Italian 1A Language
JAPA141	Beginner's Japanese 1
LAW101	law, Business and Society
MAND151	Chinese (Mandarin) for Beginners 1A
PHIL206	Practical Ethics
PHIL256 or 258	Ethics and the Environment
SPAN151	Spanish for Beginners 1
STS218	Environment in Crisis
STS300	The Environmental Context

**ELECTIVES** (*only a selection will run in a given year - refer to the University on-line calendar for details, pre-requisite requirements and session of offer*)

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

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.

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 Sub-Dean 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 Sub-Dean.

**List of Engineering Electives offered in 2012 (this list may change before the start of semester - please check the University website for more information on the subject content and objectives, etc)**

Please note that only electives with sufficient enrolments will run – so you should *enroll as soon as possible* to ensure that your electives of choice have the maximum enrolment.

**2012 Autumn Session**

<i>Subject</i>	<i>Name</i>	<i>Coordinator/Lecturers</i>
ENGG446	Energy Efficiency and Energy Auditing in the Built Environment	Dr Lan Ding, Dr Zhenjun Ma
ENGG477	Ocean Engineering	Dr Brad Stappenbelt
MECH409	Micro/Nano Robotic Systems	Dr Emmanuel Blanchard A/Prof Weihua Li
MECH419*	Finite Element Methods in Engineering	Dr Buyung Kosasih Prof Zhengyi Jiang
MECH421	Manufacturing Process Analysis	Prof Kiet Tieu, Dr Cheng Lu
MECH426	Storage & Flow of Bulk Solids	Dr David Hastie, A/Prof Peter Wypych

\* MECH419 is a core subjects for students commencing on or after 2009

**2012 Spring Session**

<i>Subject</i>	<i>Name</i>	<i>Coordinator/Lecturers</i>
ECTE471	Robotics and Flexible Automation	A/Prof Weihua Li + ECTE staff
ENGG378	Sustainable Energy Technologies	Dr Brad Stappenbelt Dr Buyung Kosasih Dr Brad Stappenbelt
ENGG433	Financial Management for Engineers	External
ENGG434	Intro to Materials Welding and Joining (by flexible delivery – i.e. not timetabled)	TBA
ENGG447	Advanced Building Design for Energy Efficiency and Sustainability	Dr Lan Ding, Dr Zhenjun Ma
ENGG448	Energy Efficiency in Manufacturing and Process Industries	Dr Zhenjun Ma
MATE401	Selection of Materials in Engineering Design	TBA
MECH423	Design for Manufacturing	Dr Devi Saini
MECH431	Computational Fluid Dynamics	Dr Buyung Kosasih
ENGG470	Applied Topics in Mechatronics	Dr Emmanuel Blanchard
MECH479	Sustainable Transport and Engine Technology	Dr Oliver Kennedy

## Electives anticipated being on offer in 2013

### 2013 Autumn Session

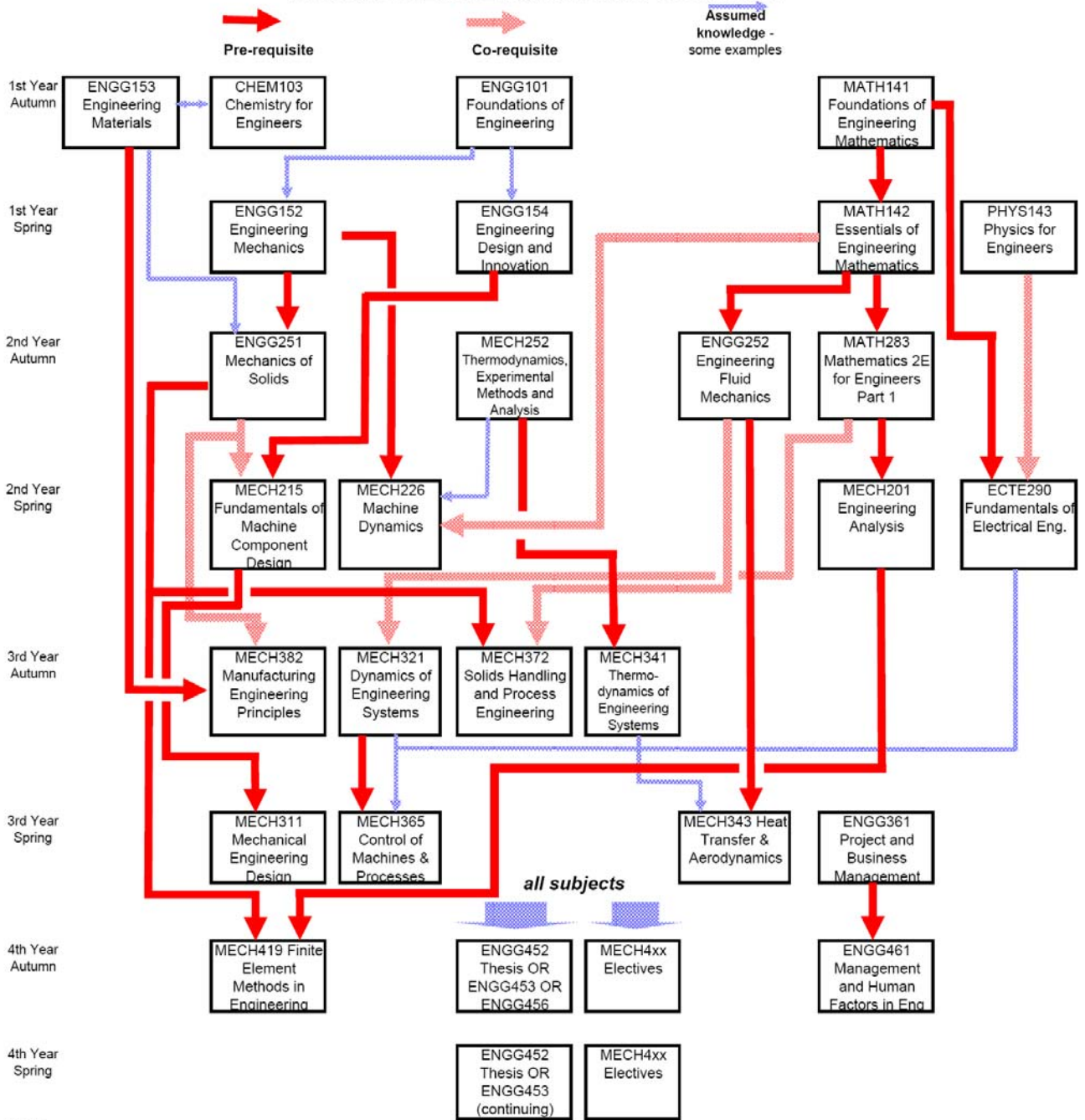
<i>Subject</i>	<i>Name</i>	<i>Coordinator/Lecturers</i>
ENGG446	Energy Efficiency and Energy Auditing in the Built Environment	Dr Lan Ding, Dr Zhenjun Ma
MECH419*	Finite Element Methods in Engineering	Dr Buyung Kosasih Prof Zhengyi Jiang
MECH421	Manufacturing Process Analysis	Prof Kiet Tieu, Dr Cheng Lu
MECH428	Pneumatic Conveying and Dust Control	A/Prof Peter Wypych
MECH468	Computer Control of Machines & Processes	Dr Emmanuel Blanchard
MECH487	Systems Analysis for Maintenance Management	A/Prof Richard Dwight
MECH489	Engineering Asset Management	A/Prof Richard Dwight

\* MECH419 is a core subjects for students commencing on or after 2009

### 2013 Spring Session

<i>Subject</i>	<i>Name</i>	<i>Coordinator/Lecturers</i>
ECTE471	Robotics and Flexible Automation	A/Prof Weihua Li + ECTE staff
ENGG378	Sustainable Energy Technologies	Dr Brad Stappenbelt Dr Buyung Kosasih Dr Brad Stappenbelt
ENGG433	Financial Management for Engineers	External
ENGG434	Intro to Materials Welding and Joining (by flexible delivery – i.e. not timetabled)	TBA
ENGG447	Advanced Building Design for Energy Efficiency and Sustainability	Dr Lan Ding, Dr Zhenjun Ma
ENGG448	Energy Efficiency in Manufacturing and Process Industries	Dr Zhenjun Ma
MATE401	Selection of Materials in Engineering Design	Prof Geoff Spinks
MECH423	Design for Manufacturing	Dr Devi Saini
MECH430	Automotive Dynamics	Dr Oliver Kennedy A/Prof Weihua Li
MECH487	System Analysis for Maintenance Management	A/Prof Richard Dwight

## MECHANICAL ENGINEERING DEGREE PROGRAM MAP



**Notes:**

4 electives are required if ENGG452 (12 CP) thesis project is completed, 3 electives if ENGG453 is completed, and 5 if ENGG456 is completed. Overall academic performance may restrict which of these thesis/project options are available to a student. Electives may be taken from 3rd year on in order to increase the choice available to students. However students need to consider any impact this may have on their overall program (for example flowing from pre and co-req linkages between subjects) that may arise as a result.

NOTE: this map is a guide only; pre-requisites and co-requisites should be checked on the University website before enrolling in subjects.