

Master of Engineering (Mechatronics)

Year and Campus:	2016
Coordinator:	Dr Chris Manzie
Contact:	<p>Melbourne School of Engineering</p> <p>Current students:</p> <ul style="list-style-type: none"> # General information: https://ask.unimelb.edu.au (https://ask.unimelb.edu.au) # Contact Stop 1 (http://students.unimelb.edu.au/stop1) <p>Future students:</p> <ul style="list-style-type: none"> # Further information: https://futurestudents.unimelb.edu.au/ (https://futurestudents.unimelb.edu.au/) # Email: course information and email link for queries (http://www.eng.unimelb.edu.au/study/degrees/master-engineering-mechatronics/overview)
Overview:	<p>Mechatronics engineering blends the disciplines of mechanical, electrical and software engineering around the principles of control systems and automation. Mechatronic engineers create and work with systems that have various degrees of automation, which is increasingly a factor of everyday life with examples including robots, automobiles and CNC machines all featuring levels of computer control.</p>
Learning Outcomes:	<p>This objectives of the course are that graduates should:</p> <ul style="list-style-type: none"> # Have a sound fundamental understanding of the scientific principles underlying technology # Have acquired the educational and professional standards of the professional institutions and boards with which the School's courses are accredited # Possess a broad knowledge base of their chosen discipline, and of other disciplines so as to facilitate effective communication with those other professionals with whom engineers routinely communicate # Understand the basic principles underlying the management of physical, human and financial resources # Have acquired the mathematical and computational skills necessary for the solution of theoretical and practical problems for further professional development and for meeting future changes in technology # Possess analytical, problem-solving and, where relevant, design skills, including those appropriate for sustainable development # Have verbal and written communication skills that enable them to make a meaningful contribution to the changes facing our society # Have developed professional ethics and responsibility towards the profession and the community # Have an appreciation of the interpersonal and management skills required by engineers in undertaking professional activities # Understand the social, cultural, global and environmental responsibilities of the professional engineer, and the need for sustainable development.
Structure & Available Subjects:	<p>The Master of Engineering (Mechatronics) consists of 300 points of study - 250 points core (compulsory) and 50 points of elective subjects from the lists below.</p> <p>Advanced standing will be awarded for equivalent subjects taken in prior study to applicants on the following basis:</p> <ul style="list-style-type: none"> # A maximum of 100 points for applicants with a 4 year Bachelor of Engineering or equivalent. # A maximum of 100 points for applicants with a 3 year undergraduate degree. Students entering with a three year bachelor degree must complete at least 200 points of study within the Masters of Engineering. In cases where applicants have completed the equivalent of more than 100 points of core masters subjects, discipline specific electives must be taken to fulfil the 200 minimum masters study requirement. <p>Note: applicants from the University of Melbourne with:</p>

An appropriate "Engineering System" major will receive 100 points of advanced standing. Applicants who have completed more than 100 points of core subjects in their undergraduate degree will obtain exemption for the cores taken but will need to replace the points in excess of 100 with approved Master of Engineering (Mechatronics) elective subjects.

Subject Options:

Total 300 points - 250 points core (compulsory) and 50 points elective subjects from the lists below. Students must complete all 300 points of subjects, including all core subjects, or have advanced standing or exemption.

The core and elective subjects are listed below. The order of subjects is one way of progressing through the course - students who meet subject requisites may tailor their individual study plan to take into account advanced standing, and if a domestic student, their study load. Students plan their study online.

Students who enter without advanced standing for Engineering Mechanics should commence in Summer Semester or in Semester 2 to assist with course planning.

Suggested first 100 points:

100 points Core

Subject	Study Period Commencement:	Credit Points:
MAST20029 Engineering Mathematics	Summer Term, Semester 1, Semester 2	12.50
ENGR20004 Engineering Mechanics	Summer Term, Semester 1, Semester 2	12.50
ELEN20005 Foundations of Electrical Networks	January, Semester 2	12.50
COMP20005 Engineering Computation	Semester 1, Semester 2	12.50
ENGR90021 Engineering Practice and Communication	Semester 1, Semester 2	12.50
MCEN30020 Systems Modelling and Analysis	Semester 2	12.5
ENGR30003 Numerical Programming for Engineers	Semester 2	12.5
COMP90041 Programming and Software Development	Semester 1, Semester 2	12.5

Suggested second 100 points:

100 points Core

Subject	Study Period Commencement:	Credit Points:
ELEN90055 Control Systems	Semester 1, Semester 2	12.50
SWEN30006 Software Modelling and Design	Semester 1, Semester 2	12.50
MCEN90038 Dynamics	Semester 1	12.5
ELEN90066 Embedded System Design	Semester 2	12.50
MCEN90041 Advanced Dynamics	Semester 2	12.5
ELEN90064 Advanced Control Systems	Semester 2	12.5
ELEN30014 Analog and Digital Electronics Concepts	Semester 1	12.5
MCEN30019 Mechatronic Systems Design	Semester 2	12.5

Suggested third 100 points:

50 points Core

- # 12.5 points mechatronics elective from list A
- # 37.5 points mechatronics electives from list B

Subject	Study Period Commencement:	Credit Points:
MCEN90032 Sensor Systems	Semester 2	12.5
MCEN90017 Advanced Motion Control	Semester 1	12.5
MCEN90040 Mechatronics Capstone Project	Year Long, Semester 1, Semester 2	25

Mechatronics Electives Group A

Total 12.5 points

Students must choose at least 12.5 points from these electives -

Subject	Study Period Commencement:	Credit Points:
MCEN90028 Robotics and Automation Systems	Semester 2	12.50
MCEN90039 Artificial Intelligence for Mechatronics	Not offered 2016	12.5
ENGR90033 Internship	January, Semester 1, Semester 2	25

Mechatronics Electives Group B

Total - up to 37.5 points

Group B Electives are streamed and enable students to gain greater depth in a particular discipline based on their background. In several cases this will be dependent on students satisfying prerequisite requirements through their previous studies.

Students may choose up to 37.5 points from these electives.

From Mechanical Engineering (5 subject streams):

- # Thermodynamics and Fluid Dynamics + Thermodynamics + Advanced Thermodynamics
- # Thermodynamics and Fluid Dynamics + Fluid Dynamics + Advanced Fluid Dynamics
- # Mechanics & Materials + Materials + Advanced Materials
- # Mechanics & Materials + Solid Mechanics + Advanced Solid Mechanics
- # Design for Manufacturing + Design for Integration

Subject	Study Period Commencement:	Credit Points:
MCEN30018 Thermodynamics and Fluid Mechanics	Semester 1, Semester 2	12.5
MCEN90015 Thermodynamics	Semester 1	12.5
MCEN90019 Advanced Thermodynamics	Semester 2	12.5
MCEN90008 Fluid Dynamics	Semester 2	12.5
MCEN90018 Advanced Fluid Dynamics	Semester 1	12.5
MCEN30017 Mechanics & Materials	Semester 1	12.5
MCEN90014 Materials	Semester 1	12.5
MCEN90020 Advanced Materials	Semester 2	12.5
MCEN90026 Solid Mechanics	Semester 2	12.5

MCEN90029 Advanced Solid Mechanics	Semester 1	12.5
MCEN90012 Design for Manufacture	Semester 1	12.5
MCEN90013 Design for Integration	Semester 2	12.5

From Electrical Engineering (3 subject streams):

- # Signal Processing + Probability and Random Models + Advanced Signal Processing
- # Electrical Device Modelling + Electronic Circuit Design + High Speed Electronics
- # Probability and Random Models + Communication Systems + Advanced Communication Systems

Subject	Study Period Commencement:	Credit Points:
ELEN90058 Signal Processing	Semester 2	12.5
ELEN90054 Probability and Random Models	Semester 1	12.5
ELEN90052 Advanced Signal Processing	Semester 1	12.5
ELEN30011 Electrical Device Modelling	Semester 2	12.5
ELEN90056 Electronic Circuit Design	Semester 1	12.5
ELEN90062 High Speed Electronics	Semester 2	12.5
ELEN90057 Communication Systems	Semester 2	12.5
ELEN90051 Advanced Communication Systems	Semester 1	12.5

From Computing and Information Systems (5 subject streams):

- # Internet Technologies + Distributed Systems + Mobile Computing Systems Programming
- # Internet Technologies + Distributed Systems + Cluster and Cloud Computing
- # Internet Technologies + Distributed Systems + Distributed Algorithms
- # Constraint Programming + Optimisation for Industry (MAST)
- # Software Architecture

Subject	Study Period Commencement:	Credit Points:
COMP90007 Internet Technologies	Semester 1, Semester 2	12.5
COMP90015 Distributed Systems	Semester 1, Semester 2	12.5
COMP90018 Mobile Computing Systems Programming	Semester 2	12.5
COMP90024 Cluster and Cloud Computing	Semester 1	12.5
COMP90020 Distributed Algorithms	Semester 1	12.5
COMP90046 Constraint Programming	Not offered 2016	12.5
MAST90014 Optimisation for Industry	Semester 1	12.5
SWEN90007 Software Design and Architecture	Semester 2	12.5

Links to further information:

http://www.eng.unimelb.edu.au/Postgrad/MEng/me_mechatronics.html

Related Course(s):

Master of Engineering