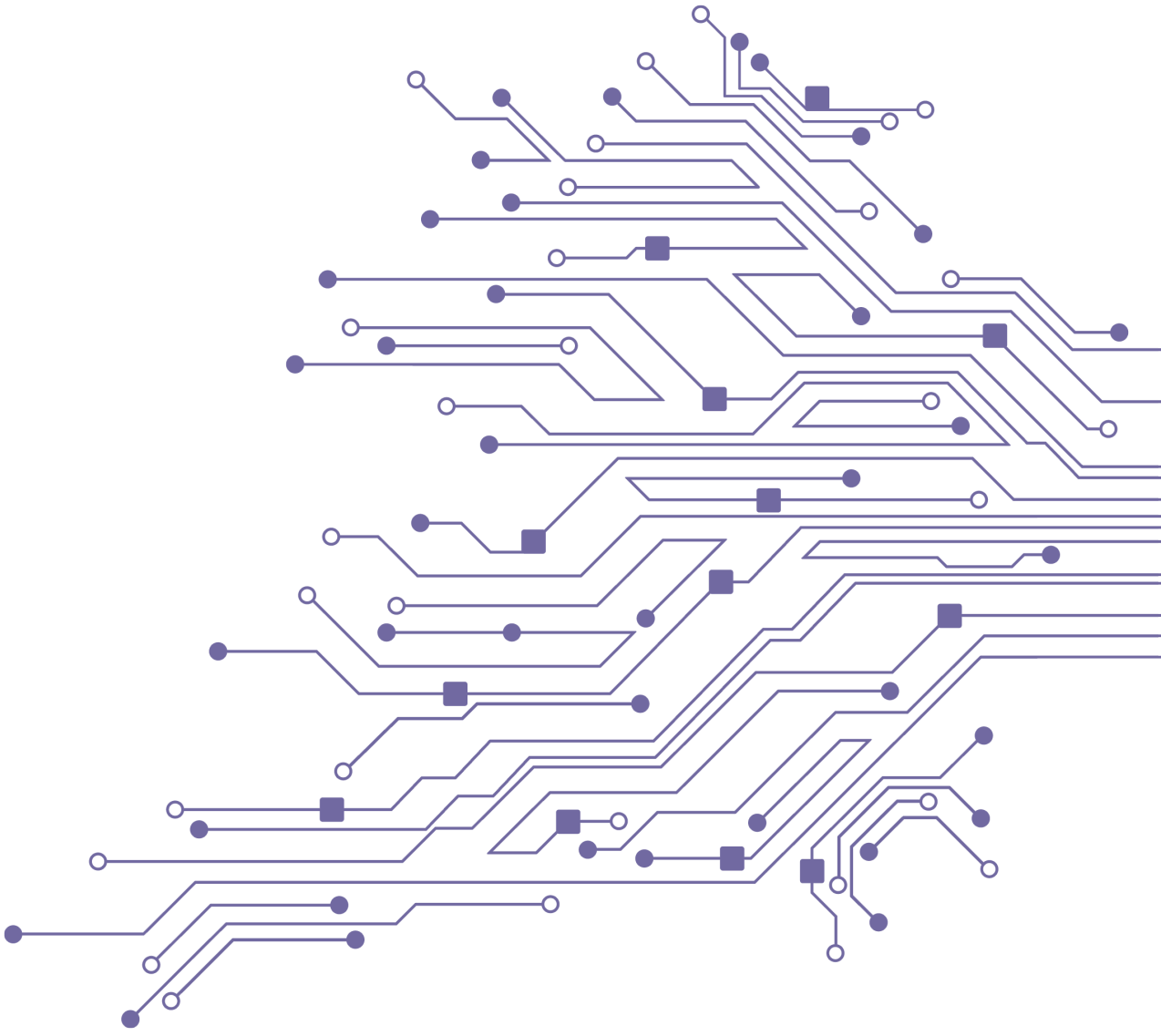
YQM.A.R.S

Mechatronics and Robotics Society

MARS Course Guide

2023



Contents

Introduction

The 2023 UQ MARS Subject Guide has been created to guide all MARS members through their degree. This is a comprehensive guide that will present suggested program structures, enrolment plans, course profiles, and offer the chance to inform students of the specific pathways available within Mechatronics Engineering. We will aim to give specialised advice from our Exec team and various UQ MARS Alumni regarding study advice, course selection and general career advice.

The **UQ Mechatronics and Robotics Society** is also commmited to not just Mechatronics Engineering students, but also various student engineers studying in adjacent fields; This includes Electrical, Mechanical, Computer, Software specialisations, as well as people in similar degrees such as Computer Science and I.T.

The guide will be divided into the following sections:

The **Recommended Enrolment Plan** is a template made by the MARS execs to provide a simple enrolment plan and leaves rooms for electives as desired.

Course Reviews and Advice contains specific details and advice for courses required in the BE(Hons) in Mechatronic Engineering and the BE/ME programs, alongside some courses in the Computer Engineering Major; as a lot of our members take these as electives.

About MARS

The *UQ Mechatronics And Robotics Society* is a student-led hub for passion and innovation in robotics and automation. Connecting members across disciplines and year levels, the society aims to foster a strong community centered on the practical development of robotics. Aspiring engineers have the opportunity to connect through our hosted workshops, seminars and competition teams.

If you're studying mechatronics or have an interest in topics such as robotics, embedded systems, computer vision, or AI/ML, then MARS is the club for you.

Events 2023

MARS have a number of events scheduled for 2023. If any of these strike your interest, be sure to follow us to keep up to date:

- Launch Party
- Mechatronics Skills Workshops
- Micromouse Competition
- Arduino Hackathon
- Droid Race Competition
- Talks and Seminars

Memberships

You can become a 2023 MARS member for just $2.00 on QPAY.

Follow Us

You can follow UQ MARS through any of the following channels.

uqmars.com
UQ Mechatronics and Robotics Society
UQ MARS
UQ Mechatronics and Robotics Society (UQ MARS)
UQ Mechatronics And Robotics Society
UQ MARS
uq.mars

Recommended Enrolment Plan

We understand that it can be confusing and/or time consuming to plan out how to best structure the courses in your program. To make the process as simple as possible, we've provided a recommended enrolment plan for the Mechatronics course plans available at UQ. Please note that this is just a suggestion, and you may need to adjust the plan to account for the electives that you choose.

Bachelor of Engineering (Honours)

Program Structure

First Year				
Semester 1	MATH1051 or MATH1071	ENGG1100	CSSE1001	ELECTIVE
Semester 2	MATH1052 or MATH1072	ENGG1300	ENGG1700	CSSE2010

Second Year					
Semester 1	MATH2001	MECH2300	ELEC2300	MATH2010	STAT2201
Semester 2	MECH2100	MECH2210	ELEC2004	MAJOR	

Third Year				
Semester 1	METR2800	METR3100	MAJOR	MAJOR
Semester 2	METR4810	MAJOR	MAJOR	MAJOR

Fourth Year				
Semester 1	METR4201	METR4202	MAJOR	MAJOR
Semester 2	ENGG4900	METR4911 or METR4912		ELECTIVE

Major Options

Within the Bachelor of Engineering (Honours) Mechatronics specialisation, there are 2 majors to choose from:

- Computer Engineering
- Mining Engineering

Computer Engineering

To complete the computer engineering major under mechatronics, you must take the following 8 courses:

- COMP3506
- CSSE2002
- CSSE2310
- CSSE3010
- ELEC3004
- MECH3200
- CSSE4010
- CSSE4011

Mining Engineering

To complete the mining engineering major under mechatronics, you must take the following 8 courses:

- ELEC3004
- MECH2300
- MINE3110
- MINE3122
- MINE3123
- MINE3129
- MINE4124
- MINE4129

Minor Options

If the majors don't meet your goals, there are 3 minors to choose from. Each minor pathway consists of a 4 course minor, plus the following 4 courses:

- ELEC2400
- ELEC3004
- MECH3200
- METR6203

Data Science Minor

The data science minor consists of both:

- DATA2001
- INFS1200

plus two of:

- COMP4702
- INFS2200
- INFS3208
- INFS4203
- STAT2003
- STAT2004

Computing Minor

The computing minor consists of both:

- CSSE2002
- COMP3506

plus two of:

- COMP4702
- COSC2500
- COSC3000
- COSC3500
- INFS1200
- INFS3208
- MATH3202

Design Minor

The design minor consists of:

- DSGN1500

plus three of:

- DSGN1100
- DSGN1200
- DSGN2100
- DSGN2200
- DSGN3100

Open Major

If none of the major or minor options live up to your expectations, the open major is what you're after. The open major pathway consists of the following 4 courses:

- ELEC2400
- ELEC3004
- MECH3200
- METR6203

plus four courses consisting of at least two of the following:

- AERO4300
- AERO4450
- AERO4470
- AERO4800
- COMP3702
- COMP3710
- COMP4702
- CSSE3010
- CSSE4010
- CSSE4011
- ELEC3100
- ELEC3310
- ELEC4310
- ELEC4410
- ELEC4620
- ELEC4630
- ENGG4103
- ENGY4000
- MECH3301
- MECH3250
- MECH4304
- MECH4950
- TIMS3309

Bachelor of Engineering (Honours) and Master of Engineering

Program Structure

First Year				
Semester 1	MATH1051 or MATH1071	ENGG1100	CSSE1001	ELECTIVE
Semester 2	MATH1052 or MATH1072	ENGG1300	ENGG1700	CSSE2010

Second Year					
Semester 1	MATH2001	MECH2300	ELEC2300	MATH2010	STAT2201
Semester 2	MECH2100	MECH2210	ELEC2004	ADVANCED	

Third Year				
Semester 1	METR3100	ELEC2400	METR2800	METR4201
Semester 2	METR4810	MECH3200	ADVANCED	ADVANCED

Fourth Year				
Semester 1	ELEC3004	METR4202	ADVANCED	ELECTIVE
Semester 2	ENGG4900	METR6203	ADVANCED	ELECTIVE

Fifth Year			
Semester 1	ENGG7291		
Semester 2	ENGG7701	ADVANCED or MASTERS	MASTERS

Advanced Electives

As part of the BE/ME program, you must take between five and seven of the following courses:

- AERO4300
- AERO4450
- AERO4470
- AERO4800
- COMP3702
- COMP3710
- COMP4702
- CSSE3010
- CSSE4010
- CSSE4011
- ELEC3100
- ELEC3310
- ELEC4310
- ELEC4410
- ELEC4620
- ELEC4630
- ENGG4103
- ENGY4000
- FIRE3700
- MATE4302
- MECH3301
- MECH3250
- MECH4304
- MECH4950
- TIMS3309

Masters Electives

As part of the BE/ME program, you must take between one and three of the following courses:

- CSSE7610
- ENGG7302
- ENGG7811
- MATE7013
- MATE7014
- MATE7015
- MATE7016
- MECH7101

Electives

If you are undertaking another degree but are still interested in the field of mechatronics, there are some options available to you.

Electrical Engineering

If you are more interested in the electrical systems of mechatronics and robotics, there are a plethora of electives you can take as an Electrical Engineering student.

- METR3100
- COMP3702
- COMP3710
- ELEC4630
- COMP4702
- METR4202
- METR6203
- CSSE4011

Mechanical Engineering

If you are more interested in the mechanical systems and physical properties of mechatronics and robotics, there are a wide selection of potential electives.

- MECH2700
- METR3100
- MECH3780
- METR4202
- AERO4800
- MECH4950

Software Engineering

The most appropriate electives you could take as a Software Engineering student interested in Mechatronics is the following

- CSSE3010
- CSSE4011
- COMP3702
- COMP3710
- COMP4702
- ELEC4630
- METR3100
- METR4202

Computer Science

The most appropriate electives you could take as a Computer Science student interested in Mechatronics is the following

- ENGG1300
- CSSE2310
- COMP3702
- COMP3710
- COMP4702
- CSSE3010

Course Profiles

AERO4300 - Aerospace Composites

Official Page
Rating: ★★★★☆
Prerequisites: MECH2300

Description
Application of composite materials used in the aerospace industry. Characteristics of composite materials; Analysis of the stiffness & strength behaviour of fibre-reinforced composite & sandwich structures; Composite materials manufacturing processes & techniques used in the aerospace industry.

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AERO4450 - Aerospace Propulsion

Official Page
Rating: ★★★★☆
Prerequisites: MECH2700, MECH3400, MECH3410

Description
Air-breathing propulsion systems; rocket propulsion systems; combustion applied to aerospace propulsion systems.

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AERO4470 - Hypersonics

Official Page
Rating: ★★★★☆
Prerequisites: MECH3410

Description
Hypersonic gas dynamics including: hypersonic wind tunnels, flow deflection techniques, viscous flows, non-equilibrium flows, rarefied gas dynamics, and satellite drag.

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AERO4800 - Space Engineering

Official Page
Rating: ★★★★☆
Prerequisites: MECH2210 and MECH3400 and MECH2700

Description

The course draws upon and extends many of the methods used by mechanical and space engineers in their professional practices. You will learn how to perform advanced trajectory design and launch vehicle sizing; analyse issues related to thermal loading and control of space systems, perform reliability estimates for complex systems, analyse complicated tasks by reducing them to their individual components, and communicate your ideas and concepts through engineering drawings and written and oral reports.

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COMP3506 - Algorithms & Data Structures

Official Page

Rating: ★★★★☆

Prerequisites: CSSE2002 and (MATH1061 or (CSSE2010 and STAT2202))

Description

Data structures & types, mapping of abstract information structures into representations on primary & secondary storage. Analysis of time & space complexity of algorithms. Sequences. Lists. Stacks. Queues. Sets, multisets, tables. Trees. Sorting. Hash tables. Priority queues. Graphs. String algorithms.

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COMP3702 - Artificial Intelligence

Official Page
Rating: ★★★★☆
Prerequisites: CSSE1001 or ENGG1001
Recommended Prerequisites: MATH1061

Description

Methods and techniques within the field of artificial intelligence, including topics on search, reasoning and planning with certainty, decision-making under uncertainty, learning to act and reasoning about other agents. Specific emphasis on the practical utility of algorithms and their implementation in software.

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COMP3710 - Pattern Recognition and Analysis

Official Page
Rating: ★★★★☆
Prerequisites: (MATH1051 or MATH1071) and (CSSE1001 or ENGG1001)
Recommended Prerequisites: (MATH1052 or MATH1072) and MATH2302 and COMP3506

Description

Understanding patterns in our environment is an important cognitive ability. The development of recognition and automated algorithms that are able to process copious amounts data without (or with limited) human intervention is critical in replicating this ability in machines. This course will cover the fundamentals of creating computational algorithms that are able to recognise and/or analyse patterns within data of various forms. Topics and algorithms will include fractal geometry, classification methods such as random forests, recognition approaches using deep learning and models of the human vision system. Python and state-of-the-art packages like Tensorflow will be used as a mechanism for students to study patterns in nature, noise and data from various real-worlds sources, such images, social media and biomedical signals.

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COMP4702 - Machine Learning

Official Page
Rating: ★★★★☆
Prerequisites: (CSSE1001 or ENGG1001) and (MATH1051 or MATH1071) and (STAT1201 or STAT2203 or STAT2202 or STAT2003)
Recommended Prerequisites: COMP3702

Description

Machine learning is a branch of artificial intelligence concerned with the development & application of adaptive algorithms that use example data or previous experience to solve a given problem. Topics include: learning problems (e.g regression, classification, unsupervised, reinforcement) & theory, neural networks, statistical & probabilistic models, clustering, ensembles, implementation issues, applications (e.g. bioinformatics, cognitive science, forecasting, robotics, signal & image processing).

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COSC2500 - Numerical Methods in Computational Science

Official Page

Rating: ★★★★☆

Prerequisites: SCIE1000 or (CSSE1001 and MATH1051 or MATH1071) or (MATH1051 or MATH1071 and MATH1052 or MATH1072)

Description

This course provides an introduction to basic numerical methods and computer programming for the solution of a number of classes of scientific problems. The course is interdisciplinary in nature, incorporating a number of case studies in biology, physics, chemistry, and engineering.

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COSC3000 - Visualization, Computer Graphics & Data Analysis

Official Page
Rating: ★★★★☆
Prerequisites: COSC2500 or CSSE2002
Recommended Prerequisites: SCIE2100

Description

Scientific visualisation is the use of images to provide insight into phenomena, and is a key tool for the analysis and understanding of biological, physical and engineering processes. It is becoming ever more important as the size of data sets continue to grow due to increasing power of computers and measurement devices. This course provides an introduction to computer graphics, data analysis and visualisation as tools to understand and interpret real world data and output from large-scale computational models.

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COSC3500 - High-Performance Computing

Official Page
Rating: ★★★★☆
Prerequisites: COSC2500 or CSSE2002
Recommended Prerequisites: SCIE2100, COSC3000

Description

This course teaches the methods and technology of high-performance computing and its usage in solving scientific problems. Major topics include: grid and cluster computing, parallel computing, agent-based modelling and simulation. The course is interdisciplinary in nature, incorporating a number of case studies in biology, physics, chemistry, and engineering.

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CSSE1001 - Introduction to Software Engineering

Official Page
Rating: ★★★★☆
Prerequisites: None

Description

Introduction to Software Engineering through programming with particular focus on the fundamentals of computing & programming, using an exploratory problem-based approach. Building abstractions with procedures, data & objects; data modelling; designing, coding & debugging programs of increasing complexity.

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CSSE2002 - Programming in the Large

Official Page
Rating: ★★★★☆
Prerequisites: CSSE1001 or ENGG1001

Description

Working on large and complex software systems and ensuring those systems remain maintainable requires disciplined, individual practices. Software must be well-specified, well-implemented and well-tested. This course covers concepts and techniques in modern programming languages that help support good practice (such as OO concepts, genericity and exception handling) with specific application to file IO and GUIs in Java.

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CSSE2010 - Introduction to Computer Systems

Official Page
Rating: ★★★★☆
Prerequisites: CSSE1001 or ENGG1001

Description
Introduction to digital logic & digital systems; machine level representation of data; computer organization; memory system organization & architecture; interfacing & communication; microcontroller architecture and usage; programming of microcontroller based systems.

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CSSE2310 - Computer Systems Principles and Programming

Official Page

Rating: ★★★★☆

Prerequisites: (CSSE1001 or ENGG1001) and (CSSE1000 or CSSE2010)

Description

Systems Programming in C. Operating Systems Principles: memory management, basics of machine organization, file systems, processes & threads, interprocess communication. Computer Networks Principles: topologies & models of computer networks, protocols, network programming, network applications.

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CSSE3010 - Embedded Systems Design & Interfacing

Official Page
Rating: ★★★★☆
Prerequisites: CSSE2310

Description

Microcontroller system hardware and software. C programming for embedded microcontroller and peripheral devices. Principles and practice of using Embedded RTOS (Real Time Operating System) and peripheral devices such as sensors and actuators to build a small embedded system. Peripheral interfacing methods and standards. Analog-digital conversion methods and interfacing. Basics of digital communication signals, modulation schemes and error correction methods. Data compression, formats for audio, image and video coding.

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CSSE4010 - Digital System Design

Official Page
Rating: ★★★★☆
Prerequisites: CSSE1000 or CSSE2010
Recommended Prerequisites: CSSE2310 and CSSE3010

Description

The objective of this course is to give the students the theoretical basis & practical skills in modern design of medium size digital systems in various technologies, with a focus on Field Programmable Gate Arrays (FPGAs). The design methodology, systematically introduced & used in the course, is based on simulation & synthesis with hardware description language (VHDL) tools. Topics covered in this course include: conceptual design step from requirements & specification to simulation & synthesis model in VHDL, design of complex controllers with Finite State Machines, design of sequential blocks with Controller-Datapath methodology, issues in design for testability, electrical & timing issues in logic and system design, overview of implementation technologies with emphasis on advances in FPGAs.

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CSSE4011 - Advanced Embedded Systems

Official Page
Rating: ★★★★☆
Prerequisites: CSSE3010

Description
Advanced topics in Embedded System, including wireless networks and wireless sensor networks.

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CSSE7610 - Concurrency: Theory and Practice

Official Page
Rating: ★★★★☆
Prerequisites: CSSE2002 or CSSE7023

Description

Provides a solid understanding of the issues of concurrent programming - processes and threads, scheduling, synchronisation, communications, and data sharing - including their application in distributed systems. The course covers methods for both the specification and verification of such systems at a high level of abstraction, and their implementation in a modern programming language.

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DATA2001 - Fundamentals of Data Science

Official Page
Rating: ★★★★☆
Prerequisites: (CSSE1001 or ENGG1001) and INFS1200

Description
This course will utilize a scenario-based methodology to approach simple and complex data science problems in various data-intensive sectors and domains.

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DSGN1100 - Design: Interaction

Official Page
Rating: ★★★★☆
Prerequisites: None

Description

This course introduces the process of design from concept to outcome through critical thinking and experimentation. It broadly focuses on the way that design creates interactions between people and contexts towards cultural and economic innovations. Techniques of observation, analysis and representation will be used alongside methods of iteration and reflection to address identified issues or problems. Learning is undertaken in a collaborative studio setting where students will develop a sensibility for the visual and spatial in design.

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DSGN1200 - Design: Experience

Official Page
Rating: ★★★★☆
Prerequisites: None

Description

This course introduces the process of design from concept to outcome through critical thinking and experimentation. It broadly focuses on the way that design creates interactions between people and contexts towards cultural and economic innovations. Techniques of observation, analysis and representation will be used alongside methods of iteration and reflection to address identified issues or problems. Learning is undertaken in a collaborative studio setting where students will develop a sensibility for the visual and spatial in design.

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DSGN1500 - Design for a Better World

Official Page
Rating: ★★★★☆
Prerequisites: None

Description

Designing changes circumstances for the better. In any existing context where people have a goal to change something, the factors they choose to wrangle and the ways they choose to do this help to shape their solution. Designing almost always starts with a problem, or at least a problematic situation. This situation sits within the context of the problem, and is affected by a range of social, economic, cultural, political, and environmental factors. A designer notices these factors in different ways and to varying degrees depending on the problem. Designing is a goal-directed activity, albeit with a goal that may not be clear at the outset. As a designer begins grappling with a problem/situation they begin to think of ways it might be solved using available or to-be-discovered materials, methods, and technologies. Ideas and judgements about how best to appropriate contextual factors to build solutions to an identified problem, using selected methods and materials, are exercised in pursuit of a/the solution. There is often oscillation between the problem as firstly described, the contextual factors prioritised, and the means of producing a solution. Each of these oscillations is heuristic - it allows the designer to learn more about the problem in the pursuit of a solution. Each attempt at solving the problem teaches the designer something about it and builds capacity for improving the solution. Ideas for ways to solve problems are embedded in all kinds of histories. Many of these ideas can be adapted in the face of a new problem in a different context. Imagination and judgement are required to develop these adaptations. The best ways to resolve context, materials, and methods to provide a good solution are learned over time and with practice.

Review

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DSGN2100 - Design: Organisation

Official Page
Rating: ★★★★☆
Prerequisites: DSGN1100

Description

This course focuses on design thinking as a facilitator of social and cultural organisation in public settings. It looks particularly at incorporating intercultural awareness into the arrangement and understanding of places reflecting diverse cultures within Australia and globally. Students will understand how people take cues from their surroundings and deploy that knowledge in response to a set design project. Learning is undertaken in a collaborative studio setting where students will develop a sensibility for strategic design thinking.

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DSGN2200 - Design: Environment

Official Page
Rating: ★★★★☆
Prerequisites: DSGN1100

Description

This course will address concepts of sustainability and resilience that can inform design in response to environmental change. The ethical dimension of design thinking will be emphasised in tackling issues and problems that have wide social and economic impact. Learning is undertaken in a collaborative studio setting where students will develop a sensibility for strategic design thinking and critical discussion.

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DSGN3100 - Design: Infrastructure

Official Page
Rating: ★★★★☆
Prerequisites: DSGN1100

Description

This course addresses the important role of design thinking in the making of public infrastructure. Emphasis is on developing innovative opportunities for design to effect outcomes in relating people with large-scale urban or landscape projects. Learning is undertaken in a collaborative studio setting focused on advancing leadership and team building skills relevant to engaging multi-disciplinary working groups and community stakeholders involved in the delivery of public infrastructure.

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ELEC2004 - Circuits, Signals & Systems

Official Page
Rating: ★★★★☆
Prerequisites: ELEC1300
Companion Courses: MATH2001 and MATH2010

Description

Mathematical models of electrical components, circuits & systems. Time & frequency response. Issues in building complex systems from subsystems, including feedback. Signal theory & filter design. Theoretical investigations, substantial case studies & laboratory experiments.

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ELEC2300 - Fundamentals of Electromagnetism and Electromechanics

Official Page

Rating: ★★★★☆

Prerequisites: ENGG1300 and (MATH1051 or MATH1071) and (MATH1052 or MATH1072) and (PHYS1171 OR High School Physics)

Description

This course covers fundamental principles of electromagnetism, rotating electrical machines and power transformers. The course is intended to link underlying physics of electromagnetic fields to the operation of electrical machines. The learning activities include substantial case studies & laboratory experiments.

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ELEC2400 - Electronic Devices and Circuits

Official Page

Rating: ★★★★☆

Prerequisites: ENGG1300 and (MATH1051 or MATH1071) and (MATH1052 or MATH1072)

Description

Physical models of semiconductor devices. Analysis and design of common electronic circuits using discrete semiconductor devices and operational amplifiers. Examples of use in analysis & design of amplifiers, analogue signal conditioning, filters and other circuits.

Review

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ELEC3004 - Signals, Systems & Control

Official Page
Rating: ★★★★☆
Prerequisites: ELEC2004 and (STAT2202 or STAT2201)

Description

Discrete-time signals & systems, system properties (linearity, time-invariance, memory, causality, stability), sampling & reconstruction, A/D and D/A converters, DFT/FFT, z transform, stochastic processes, frequency-selective filters, effect of feedback, introduction to control.

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ELEC3100 - Fundamentals of Electromagnetic Fields & Waves

Official Page
Rating: ★★★★☆
Prerequisites: (ELEC2003 or ELEC2300) and (MATH2000 or MATH2001)
Companion Courses: MATH2010

Description

Fundamentals of engineering electromagnetics including transmission lines, time varying fields, plane waves, waveguides, radiation and basic antennas. Applications in area of communications & sensors.

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ELEC3310 - ELEC3310 - Electrical Energy Conversion & Utilisation

Official Page
Rating: ★★★★☆
Prerequisites: ELEC2003 or ELEC2300

Description

Generation of electricity. Three phase balanced circuits; magnetic circuits. Transformers. Harmonics. Steady state analysis of dc. Synchronous & induction machines. Special motors. Modern motor control systems. Demand side management. Renewable energy sources. Distributed generation & uninterruptible power supplies.

Review

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ELEC4310 - Power Systems Analysis

Official Page
Rating: ★★★★☆
Prerequisites: ELEC3300 or ELEC3310

Description
Overview of power system modelling, load flow analysis, symmetrical & unsymmetrical fault calculation, power system stability, application of software tool for power system analysis, distribution network and voltage regulation, basic market structure.

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ELEC4410 - Advanced Electronic & Power Electronics Design

Official Page
Rating: ★★★★☆
Prerequisites: ELEC2400 or ELEC3400

Description

This course is about power processing using control, signal processing and electronic systems. The application can be from many Mega Watts in an electric train or a wind farm to less than a few Watts in a digital camera or a mobile phone. For modern power electronics system, computer simulation tools are used to analyse and optimise a design before any prototyping. Topics covered in this course are a) power electronic systems and applications such as motor drive, renewable energy and power supply systems; b) energy conversion topologies; c) modelling and control; d) design factors and computer simulations.

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ELEC4620 - Digital Signal Processing

Official Page
Rating: ★★★★☆
Prerequisites: ELEC3004
Recommended Prerequisites: CSSE3010
Companion Courses: Advanced digital filtering: polyphase, multirate, all-pass, lattice & IIR filters. Signal conditioning, analog filter types, sigma delta converters. Fast algorithms; Cooley-Tukey FFT, mixed radix formulations, Good-Thomas algorithm. Autoregressive, moving average signals. DSP applications and programming.

Description
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Review

ELEC4630 - Image Processing and Computer Vision

Official Page
Rating: ★★★★☆
Prerequisites: ELEC3004

Description
Image sensors, colour models, discrete cosine transform, image & video compression. Computer vision, morphological techniques, watershed transform, skeletonisation, image segmentation, active contour.

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ENGG1100 - Professional Engineering

Official Page
Rating: ★★★★☆
Prerequisites: None

Description

Introduction to engineering design through a discipline-specific team project. Students will learn and apply professional engineering concepts and issues including: sustainability, safety, estimation, materials selection, decision making, project management, information literacy, communication (graphics, written, oral), ethics, and prototyping (building). The course provides an introduction to engineering as a profession.

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ENGG1300 - Introduction to Electrical Systems

Official Page

Rating: ★★★★☆

Prerequisites: Mathematical Methods, Maths B or MATH1040

Description

Introduction to electrical circuits & systems. Solution of simple AC and DC Circuits. Electrical units & measurements. Voltage, current, impedance. Equivalent circuits. Electrical energy & power. Resistors, inductors, capacitors, phasors, filters. Introduction to analog and digital telecommunication systems. Operational amplifiers, sensors & actuators, simple controllers. Use of laboratory instruments, simulators and mathematical software tools.

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ENGG1700 - Statics and Materials

Official Page
Rating: ★★★★☆
Prerequisites: Mathematical Methods, Maths B or MATH1040

Description

In this course students will:

- Develop conceptual understanding and fundamental engineering skills in statics and materials across a range of contexts.
- Combine their knowledge of statics and materials to an authentic design task.
- Engage in hands on learning including small design,build,test activities

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ENGG4103 - Engineering Asset Management

Official Page
Rating: ★★★★☆
Prerequisites: None

Description

Fundamentals of Reliability Engineering: failure intensity functions; system reliability; exploratory data analysis; the Weibull function; design for reliability; HAZOP; FMECA. Maintenance Management; preventive, predictive, proactive and corrective methods and their place in maintenance strategy; maintenance performance indices; workforce estimation and organisational structure; spare parts administration; maintenance contracts and contract administration; reliability centred maintenance; total productive maintenance. Preventive component replacement and capital equipment replacement decisions.

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ENGG4900 - Professional Practice and the Business Environment

Official Page
Rating: ★★★★☆
Prerequisites: None

Description

Professional Practice is designed to give you the knowledge needed to effect change and implement design solutions in the real world. You will be able to identify barriers to technology uptake and work towards overcoming these through practical knowledge of: engineering economics, engineering law, engineering ethics, and the nature of engineering businesses. Students will learn how to undertake and interpret cost-benefit analyses, develop the skills required to understand business decision-making and economic drivers relevant to engineering and investigate key concepts required for ethical professional practice. Industry representatives and academics will deliver keynote lectures. Students will engage in workshops and project-based discipline-specific content and assessment which will lead the student through the issues encountered in professional engineering practice. Assessment will have both written and oral sections.

Review

review here

ENGG7291 - Engineering Placement A

Official Page
Rating: ★★★★☆
Prerequisites: None

Description

A major investigation or research project or a significant design task in industry, UQ or another university/research institute that integrates factors encountered in real life industry or research projects. Please note: This course falls outside the regular semester dates. Students are required to undertake a placement of up to 24 weeks in duration between January to June for semester 1. This course is restricted to BE(Hons)/ME students in the Fields of Electrical, Electrical & Computer, Electrical & Biomedical, Mechanical, Mechanical & Aerospace, Mechatronic, Software Engineering. Students need to contact EAIT Employability (employability@eait.uq.edu.au) to make arrangements for suitable placements in the semester prior to their required placement semester.

Review

review here

ENGG7302 - Advanced Computational Techniques in Engineering

Official Page

Rating: ★★★★☆

Prerequisites: MATH2001 and MATH2010 and STAT2202

Description

An advanced course designed to deepen student knowledge and capability in computational techniques in areas of particular importance to engineering. Topics are drawn from linear algebra, stochastic systems and optimisation theory with emphasis on applications and examples in various fields of engineering including but not limited to biomedical engineering, electricity market, embedded systems and microwave & telecommunications. Practical skills in MATLAB programming are developed.

Review

review here

ENGG7701 - Engineering Grand Challenges

Official Page
Rating: ★★★★☆
Prerequisites: None

Description

Implications of being a professional engineer in the 21st century. Human forces: socio-political, psychology, economics and leadership. Societal Grand Challenges. Improved communications skills.

Review

review here

ENGG7811 - Research Methods

Official Page
Rating: ★★★★☆
Prerequisites: None

Description
Research methodology & research tools for computer science & engineering. Theoretical & practical material for starting, supporting & advancing research project work.

Review
review here

ENGY4000 - Energy Systems

Official Page
Rating: ★★★★☆
Prerequisites: (CHEE3020 and CHEE3004) or MECH3400

Description
This course provides an overview of a wide range of energy systems including energy production from renewable (solar, wind, hydro, ocean, biomass) and non-renewable (fossil and nuclear) resources in the context of climate change and energy transitions. A range of engineering principles will be consolidated (i.e. mass & energy balances, thermodynamic cycles, process optimisation & power generation) in tandem with the application of sustainable development principles and business perspectives.

Review
review here

FIRE3700 - Introduction to Fire Safety Engineering

Official Page
Rating: ★★★★☆
Prerequisites: CIVL2131 and CIVL2330

Description
This course provides an introduction to the implementation of fire safety in infrastructure, industry and vehicles. The focus of the course is to establish the knowledge and rationale followed when bringing safety into the design process.

Review
review here

INFS1200 - Introduction to Information Systems

Official Page
Rating: ★★★★☆
Prerequisites: None

Description
Information systems analysis, design and implementation, relational database technology, data modelling, data querying using SQL, building a small scale information systems using a relational database management system.

Review
review here

INFS2200 - Relational Database Systems

Official Page
Rating: ★★★★☆
Prerequisites: INFS1200

Description

Concepts needed to build large information system using current technology; relational & other data models, query processing & views, index structures for access, dataflow & dynamic models.

Review

review here

INFS3208 - Cloud Computing

Official Page
Rating: ★★★★☆
Prerequisites: CSSE1001 and INFS1200

Description

As a major computing infrastructure, Cloud Computing provides the modern on-demand services for management and usage of large and shared computing resources including storage, computations and communications. This course will cover in-depth knowledge for Cloud Computing and the practical experience in designing and implementing large-scale and composite business web applications on Cloud Computing platform. This course covers a wide range of cloud computing-related X-as-a-Service technologies, including Software-as-a-Service (SaaS), Platform-as-a-Service (PaaS), Infrastructure-as-a-Service (IaaS), Data-as-a-Service (DaaS), and related technologies such as Cloud Computing Ecosystem. For delivering scalable computing services in a pay-as-you-go model via the Internet, Cloud Computing approaches are used to deal with effective and efficient development and deployment problems of web services and information systems with particular focus on ”big data” challenges that arise across a variety of domains.

Review

review here

INFS4203 - Data Mining

Official Page
Rating: ★★★★☆
Prerequisites: (CSSE1001 or ENGG1001) and INFS2200

Description
Techniques used for data cleaning, finding patterns in structured, text and web data; with application to areas such as customer relationship management, fraud detection & homeland security.

Review
review here

MATE4302 - Electrochemistry and Corrosion

Official Page
Rating: ★★★★☆
Prerequisites: None

Description
Fundamental of electrochemical reactions, thermodynamics and kinetics of electrochemical reactions, mass transfer/diffusion in electrolytes, electrochemical method of analysis, applications (fuel cells, re-chargeable batteries, super-capacitors, and photo-electrochemical reactions), corrosion fundamentals, design against corrosion, corrosion protection principles & practice, corrosion in common environments, corrosion resistant alloys.

Review
review here

MATE7013 - Advanced Manufacturing

Official Page
Rating: ★★★★☆
Prerequisites: MECH2300 or MECH2310
Recommended Prerequisites: MECH3301

Description

Current global problems require increasingly sophisticated materials and appropriate advanced approaches and methodologies for their manufacture. This course will look at materials design for device manufacture, manufacturing techniques and manufacturing systems that are used to deliver innovative products and devices from the laboratory to industrial production. Several key manufacturing techniques, such as nano-, electronic and sustainable manufacturing will be covered as case studies illuminating how materials and manufacturing processes affect the end performance of the product, the economics of production and the impact on society and the environment. To obtain greater insight into smart manufacturing processes, students will complete projects, literature reviews/lab reports and oral/poster presentations in specific areas of manufacturing.

Review

review here

MATE7014 - Advanced Materials Characterization

Official Page
Rating: ★★★★☆
Prerequisites: None

Description

Materials Characterization provides unique tools for understanding the materials and their demonstrated properties. Materials Characterization techniques, such as x-ray diffraction, scanning electron microscopy, and transmission electron microscopy, allow detailed structural, chemical, and morphological characteristics of materials to be determined, which has become essential tools for materials research and their productions. By corelating the determined structural and chemical characteristics of a material with its fabrication/processing, the formation mechanism of the material can be clarified. This is vital for developing new material systems, and for identifying problems in the production lines. On the other hand, the correlation of the determined structural and chemical characteristics of a material with its demonstrated properties allows the material's structure-property link to be built, which is critically important for understanding the origin of the properties. For this reason, demand for learning various materials characterization techniques have increased sharply in the recent decades.

Review

review here

MATE7015 - Additive Manufacturing

Official Page
Rating: ★★★★☆
Prerequisites: None

Description

Additive Manufacturing (AM), also known as 3D printing, is growing at a rapid rate with global manufacturers increasingly realising the benefits of producing parts by AM. In 2017 there was 80% year on year growth in metal AM system sales, and over an 800% increase from 2012 [1]. AM is becoming a mainstream manufacturing process because it can not only reduce manufacturing time and costs but also offers flexibility to produce geometrically complex designs with superior functionality. An example is newly optimised 3D printed metal aircraft brackets that are 50% lighter, use 90% less material and 90% less energy to produce compared to the equivalent bracket currently produced by machining. Given that AM will continue to grow, future engineers must adapt to this revolutionary manufacturing process so now is a timely opportunity to introduce a dedicated course that prepares our graduates for working with this technology.

Review

review here

MATE7016 - Materials for Energy Conversion and Storage

Official Page
Rating: ★★★★☆
Prerequisites: None

Description

Energy storage and conversion materials hold the key to many advanced renewable energy technologies including photo-voltaic systems, lithium-ion and next-generation batteries, hydrogen fuel cells and storage, and superconducting magnetic energy storage. With the increasing need for safe, cost-effective and environmentally friendly methods of energy storage and conversion, it is necessary to accelerate the rate at which energy-related materials are developed. Materials science is an essential enabling technology for emerging renewable technologies. Often, engineering solutions for the energy challenges facing society are constrained by the materials technologies available. This is especially true for energy storage and conversion materials. The aim of this course on Materials for Energy Conversion and Storage is to help future engineers create and develop new materials solutions to meet this global challenge.

Review

review here

MATH1051 - Calculus & Linear Algebra I

Official Page

Rating: ★★★★☆

Prerequisites: MATH1050; or a grade of C or higher in Queensland Year 12 Specialist Mathematics (Units 3 & 4) (or equivalent)

Description

Vectors, linear independence, scalar product. Matrices, simultaneous equations, determinants, vector product, eigenvalues, eigenvectors, applications. Equation of straight line & plane. Extreme value theorem, maxima & minima. Sequences, series, Taylor series, L'Hopital's rules. Techniques of integration, numerical methods, volumes of revolution.

Review

review here

MATH1052 - Multivariate Calculus & Ordinary Differential Equations

Official Page

Rating: ★★★★☆

Prerequisites: MATH1050 or A grade of C or higher in Queensland Year 12 Specialist Mathematics (Units 3 & 4) (or equivalent)

Recommended Prerequisites: MATH1051

Description

Vector calculus, arclength, line integrals, applications. Calculus of 2 & 3 variables: partial derivatives, conservative fields, Taylor series, maxima & minima, non-linear equations. 1st order & linear 2nd order differential equations (constant coefficients). Applications (dynamical systems etc), numerical methods.

Review

review here

MATH1071 - Advanced Calculus & Linear Algebra I

Official Page

Rating: ★★★★☆

Prerequisites: A grade of 6 or above in MATH1050; or a grade of B or higher in Queensland Year 12 Specialist Mathematics (Units 3 & 4) (or equivalent)

Description

1. Elementary linear algebra: Vectors, linear independence, scalar product. Matrices, simultaneous equations, determinants, Gaussian elimination, eigenvalues, eigenvectors, applications. Equation of straight line & plane.

2. Introduction to proof-based calculus: Fields, sequences, limits, continuity, intermediate and extreme value theorems, maxima & minima.

3. Techniques of calculus: Series, differentiation, integration, numerical methods, Taylor series, L'Hopital's rule. This course differs from MATH1051 by treating material in more depth and with greater rigour.

Review

review here

MATH1072 - Advanced Multivariate Calculus & Ordinary Differential Equations

Official Page

Rating: ★★★★☆

Prerequisites: A grade of 6 or above in MATH1050; or a grade of B or higher in Queensland Year 12 Specialist Mathematics (Units 3 & 4) (or equivalent)

Description

Vector calculus, arc-length, line integrals, applications. Calculus of 2 & 3 variables: partial derivatives, conservative fields, maxima & minima. 1st order & linear 2nd order differential equations (constant coefficients). Applications (dynamical systems etc), numerical methods for non-linear equations and differential equations. Introduction to mathematical modelling and programming.

Review

review here

MATH2001 - Calculus & Linear Algebra II

Official Page
Rating: ★★★★☆
Prerequisites: (MATH1051 or MATH1071) and (MATH1052 or MATH1072)

Description

Second order differential equations; undetermined coefficients, variation of parameters. Multi-dimensional calculus; surface & volume integrals, cylindrical, spherical and general coordinate transformations. Stoke's & Green's theorems, applications (flux, heat equations). Linear algebra, diagonalization, quadratic forms, elementary numerical linear algebra. Taylor series, maxima, minima and saddle points in N-dimensions. Method of least squares for functions. Vector spaces, norms and inner products (for square-integrable functions). Gram-Schmidt orthogonalisation and orthogonal matrices.

Review

review here

MATH2010 - Analysis of Ordinary Differential Equations

Official Page
Rating: ★★★★☆
Prerequisites: MATH1052 or MATH1072
Companion Courses: MATH2000 or MATH2001

Description
ODE's - Systems: variation of constants, fundamental matrix. Laplace transform, transform for systems, transfer function. Stability, asymptotic stability; phase plane analysis.

Review
review here

MATH3202 - Operations Research & Mathematical Planning

Official Page

Rating: ★★★★☆

Prerequisites: (MATH1051 or MATH1071) and (MATH1052 or MATH1072)

Description

Techniques and applications of optimisation in operations research, including linear programming, integer programming, dynamic programming and meta-heuristics. Use of Python and the Gurobi optimisation package for linear and integer programming.

Review

review

MECH2100 - Machine Element Design

Official Page
Rating: ★★★★☆
Prerequisites: MECH2300
Recommended Prerequisites: MECH2305

Description

Mechanical design principles. Design, manufacture & assembly of basic machine elements. Machine frames, welded, adhesive & bolted joints, fasteners. Stepped shafts & features, rolling element bearings; gear mechanics & manufacture. Design for strength, design for other mechanical failure modes including fatigue, stress concentration. Safety, ergonomics & standards.

Review

review here

MECH2210 - Intermediate Mechanical & Space Dynamics

Official Page

Rating: ★★★★☆

Prerequisites: (ENGG1010 OR ENGG1400 OR ENGG1700) and MATH1051 and MATH1052

Description

Applications of kinematics and kinetics of particles and rigid bodies; Applications of energy and momentum methods; Vibration of single degrees of freedom systems; Balancing of rotating & reciprocating masses; Lagrange's equations; Introductions to orbital mechanics & 3D rigid body dynamics with mechanical and space applications.

Review

review here

MECH2300 - Structures & Materials

Official Page

Rating: ★★★★☆

Prerequisites: [(ENGG1010 or ENGG1400) and (ENGG1200 or MATE1000 or ENGG1211)] or ENGG1700

Description

Mechanics of simple structures; Transformation of stress and strain; Linear elasticity; Phase diagrams; Steel microstructures; Strengthening mechanisms of metals; Material failure mechanisms; Corrosion; Risk assessment.

Review

review here

MECH2700 - Computational Engineering and Data Analysis

Official Page
Rating: ★★★★☆
Prerequisites: (ENGG1001 or CSSE1001) and (MATH1051 or MATH1071)
Recommended Prerequisites: (MATH1052 or MATH1072)

Description

Modelling & analysis in mechanical engineering. Computer-assisted problem solving: calculation, simulation & numerical methods.

Review

review here

MECH3200 - Advanced Dynamics and Vibrations

Official Page
Rating: ★★★★☆
Prerequisites: MECH2210

Description

Discrete systems: multidegree of freedom systems & applications; vibration isolation and absorption. Continuous systems: free and forced vibration, modal analysis, approximate techniques, finite element method. Advanced topics: vibration measurement techniques, nonlinear phenomena, demonstration project.

Review

review here

MECH3250 - Engineering Acoustics

Official Page
Rating: ★★★★☆
Prerequisites: MATH1051 and MATH1052 and (ENGG1400 or ENGG1700)

Description

Plane sound waves; physical aspects of sound; the human ear; physiological aspects of sound; sound level meters; statistical noise measures; occupational noise; road-traffic noise; directivity of sound; reflection & transmission of sound; sound in enclosed spaces; engineering acoustics applications.

Review

review here

MECH3301 - Materials Selection

Official Page
Rating: ★★★★☆
Prerequisites: MATE1000 or ENGG1200 or ENGG1211

Description
Principles & practice of materials selection in mechanical design. Influence of shape on selection. Economic aspects. Use of data sources. Material indices. Generation & use of material selection charts. Selection of fabrication method. Concurrent and compound objectives. Selection of materials for a practical application (project).

Review
review here

MECH3780 - Computational Mechanics

Official Page
Rating: ★★★★☆
Prerequisites: MECH3400 and (MECH2410 or MECH3410) and (MECH2700 or MECH3750)
Companion Courses: MECH3410

Description
needs description

Review
review here

MECH4304 - Net Shape Manufacturing

Official Page
Rating: ★★★★☆
Prerequisites: MECH2305

Description
Net-shape manufacturing of metals & ceramics processes: casting from liquid state & consolidation of components from powders pressed into almost finished complex shapes. Understanding of the principles of solidification & powder processing & principles used in the manufacture of components.

Review
review here

MECH4950 - Advanced Manufacturing in Practice

Official Page
Rating: ★★★★☆
Prerequisites: Permission of Head of School

Description
(Course is offered on an occasional basis.) Topics & content to be determined by student interest & availability of visiting staff. For details, consult course coordinator. For information about how to enrol in this course, please email studentenquiries@mechmining.uq.edu.au.

Review
review here

MECH7101 - Design of Experiments

Official Page
Rating: ★★★★☆
Prerequisites: None

Description
Students will learn how to design experiments to explore the entire parameter space for an engineering problem; they will learn how to test hypotheses to a desired degree of confidence; they will learn how to process data from engineering sensors and how to analyse such data using advanced multivariate statistics.

Review
review here

METR2800 - Mechatronic System Design Project I

Official Page
Rating: ★★★★☆
Prerequisites: None
Recommended Prerequisites: ENGG1100, ENGG1300, CSSE2010, MECH2100, MECH2210

Description

Introduction to mechatronic engineering. Technical: mechatronic technology exemplars; mechanical & electrical drawing; small mechatronic product designed & tested for potential client. Organisational: project team must follow standard procedures - milestones, reporting, project meetings, interacting with client.

Review

review here

METR3100 - Control System Implementation

Official Page
Rating: ★★★★☆
Prerequisites: ENGG1300
Companion Courses: ELEC2003 or ELEC2004

Description

METR3100 introduces students to engineering frameworks that support the design and implementation of safe, robust control systems. Students are shown how to identify and mitigate against hazards using a system theoretic approach to managing risk. The course also explores the operating principles of sensing, logic, and actuation subsystems that comprise an overall control system.

Review

review here

METR4201 - Control Engineering 1

Official Page
Rating: ★★★★☆
Prerequisites: MECH2210 or ELEC2004

Description
Introduction to control system design; system modelling principles for electrical & mechanical systems; the Laplace transform; block diagram modelling; open & closed loop control; role of feedback; transient & steady state performance; root locus; frequency response analysis; compensator design, practical issues in the implementation of control systems.

Review
review here

METR4202 - Robotics & Automation

Official Page
Rating: ★★★★☆
Prerequisites: ELEC3004 or METR3200 or METR4201

Description
Modern control & robotic techniques for use in practical applications. Coverage of advanced control methodologies & intelligent robotic systems.

Review
review here

METR4810 - Mechatronic System Design Project II

Official Page
Rating: ★★★★☆
Prerequisites: None
Recommended Prerequisites: METR2800

Description

Technical: Small teams of students undertake design, implementation, testing, evaluation & presentation of mechatronic systems of intermediate size & complexity. Organisation: project team must follow standard procedures, milestones, reporting, project meetings, interacting with client.

Review

review here

METR4911 - Thesis / Design Project

Official Page
Rating: ★★★★☆
Prerequisites: None

Description
Thesis/design project on topic in mechatronic engineering. Students commencing in Semester 1 enrol in METR4911 for Semester 1 (Part A) and Semester 2 (Part B); students commencing in Semester 2 enrol in METR4912 for Semester 2 (Part A) and the following Semester 1 (Part B).

Review
review here

METR4912 - Thesis / Design Project

Official Page
Rating: ★★★★☆
Prerequisites: None

Description
Thesis/design project on topic in mechatronic engineering. Students commencing in Semester 1 enrol in METR4911 for Semester 1 (Part A) and Semester 2 (Part B); students commencing in Semester 2 enrol in METR4912 for Semester 2 (Part A) and the following Semester 1 (Part B).

Review
review here

METR6203 - Control Engineering 2

Official Page
Rating: ★★★★☆
Prerequisites: METR4201 or METR7200

Description

Coverage of various advanced topics in control systems engineering: (i) observers and state estimation, (ii) multivariable systems in the frequency domain, (iii) robust control, and (iv) model predictive control.

Review

review here

MINE3110 - Integrated Orebody Knowledge

Official Page
Rating: ★★★★☆
Prerequisites: None

Description

This course will introduce the concepts of resource and reserve estimation in both coal and metalliferous deposits. This represents a critical component in the life cycle of a mine and provides the link between the processes of exploration geology and mine planning.

Review

review here

MINE3122 - Mining Systems

Official Page
Rating: ★★★★☆
Prerequisites: None
Recommended Prerequisites: MINE2103 or MINE2105

Description
This course presents a systems approach to the principles, design and application of the major surface and underground mining methods together with the associated equipment, services and infrastructure.

Review
review here

MINE3123 - Mine Planning

Official Page
Rating: ★★★★☆
Prerequisites: None
Recommended Prerequisites: MINE3122

Description

This course deals with the theoretical principles and practical methodologies associated with mine planning. Mine Planning is an iterative process entailing elements of design, scheduling and evaluation. As part of the planning process a range of issues has to be considered including sustainability, statutory requirements and community expectations, mining method selection and mine layout, scheduling, equipment selection, cost estimation and economic evaluation, pre-feasibility studies and risk analysis. The course provides a step-by-step approach to developing a pre-feasibility study for a mining project.

Review

review here

MINE3129 - Applied Mining Geomechanics

Official Page
Rating: ★★★★☆
Prerequisites: None

Description

Understanding of geomechanical behaviour of orebody and host rock is of critical importance to achieve safe and efficient mining operations and has become an integral part of a mine design and planning. As mines are getting deeper, the ground in situ stress and water pressure are also increasing, which requires more in-depth understanding of rock mass to address this emerging grant challenge in deep mining. This course provides students with a fundamental knowledge of rockmass properties, and with a practical understanding of the applications of geotechnical engineering principles in mining from the perspective of planning, design, and operations. This will enable students to understand and apply fundamental concepts and design methodologies to design safe excavations in both surface and underground mines.

Review

review here

MINE4124 - Hard Rock Mine Design & Feasibility

Official Page
Rating: ★★★★☆
Prerequisites: None
Recommended Prerequisites: MINE3123

Description

Development of a pre-feasibility study for a metalliferous mining project. Activities include: assessment of reserves, method selection, layout and optimisation of surface and underground operations, geotechnical design, ventilation design, project risk assessment, mine scheduling, equipment selection, cost estimation, economics / finance and sustainability. Usage of mine design and optimisation software packages.

Review

review here

MINE4129 - Mine Process Optimisation

Official Page
Rating: ★★★★☆
Prerequisites: None
Recommended Prerequisites: MINE3122

Description
Needs description

Review
review here

STAT2003 - Mathematical Probability

Official Page
Rating: ★★★★☆
Prerequisites: MATH1051 or MATH1071
Companion Courses: MATH2001

Description
Probability; random variables; probability distributions; Markov processes; statistical analysis & modelling

Review
review here

STAT2004 - Statistical Modelling & Analysis

Official Page

Rating: ★★★★☆

Prerequisites: ((MATH1051 or MATH1071) + (STAT1201, STAT1301 or STAT2201) + STAT2003 OR STAT2203

Description

Statistical inference; parametric models; point estimation; properties of estimators; maximum likelihood (ML) and properties of ML estimators; confidence intervals; hypothesis testing; goodness-of-fit tests; Bayesian inference; ANOVA; linear and logistic regression.

Review

review here

STAT2201 - Analysis of Engineering & Scientific Data

Official Page

Rating: ★★★★☆

Prerequisites: MATH1050 or; a grade of C or higher in Queensland Year 12 Specialist Mathematics (Units 3 & 4) (or equivalent)

Description

Statistical models & analyses required for analysing engineering & scientific data, including sampling methods, exploratory data analysis, standard probability models, estimation, hypothesis tests, regression, experimental design.

Review

review here

TIMS3309 - Technology and Innovation Management

Official Page
Rating: ★★★★☆
Prerequisites: None

Description

Introduction to the management of technology and innovation, including strategic and operational technology and innovation management, business competitiveness, business partnerships and alliances, managing R&D, new product development, and valuation of technology. The course is intended to develop corporate entrepreneurs who effectively manage innovation leading firms.

Review

review here

General Advice

There are many things that you can be doing alongside your studies. This section will cover advice from our executive team to help you make the most of your time at university.

Get Involved

A massive way to both maximise your uni experience and make yourself more employable is to (within reason) say yes to eveything. Within MARS, we have many opportunities for this, ranging from skills workshops, to industry networking, to competition teams. Outside of MARS, there are still ways to engage in extracurriculars in other forms, such as:

- Get Involved (Volunteering)
- EAIT Ambassador program
- UQ Ventures

Stay Up To Date

It's very useful to keep yourself up to date with what is going on in the field, and stay aware of what opportunities are available. There are a number of mailing lists available, including the ARAA Robotics ANZ mailing list, the KIT Robotics Worldwide mailing list, and the euRobotics AISBL mailing list.

Put Your Name Out There

Don't be scared to make yourself known in the industry. A great way to do this is through getting yourself along to networking events and meeting people face-to-face. Networking events are always going to be limited in the number of companies that can be present, so another solution to get your name out there is through talent portals, such as our partner River City Labs' intern portal.

Acknowledgments

A massive thank you goes to everyone who has taken time to help us develop this resource. Primarily to Quinn Horton and Shwethank Nampalli for coordinating development. A special thanks also to Jay Hunter for making additional contributions. We also acknowledge the contributions of the following in helping to provide student insight towards the courses listed in the guide:

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