



MARS Course Guide

2023



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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 committed 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



Membership



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 | CSSE1001 |

| Second Year | | | | | |
|-------------|----------|----------|----------|----------|----------|
| Semester 1 | MATH2001 | MECH2300 | ELEC2300 | MATH2010 | STAT2201 |
| Semester 2 | MECH2100 | MECH2210 | ELEC2004 | METR2800 | |

| Third Year | | | | |
|------------|----------|-------|-------|-------|
| Semester 1 | METR3100 | MAJOR | MAJOR | MAJOR |
| Semester 2 | METR4810 | MAJOR | MAJOR | MAJOR |

| Fourth Year | | | | |
|-------------|----------|----------------------|-------|----------|
| Semester 1 | METR4201 | METR4202 | MAJOR | MAJOR |
| Semester 2 | ENGG4900 | METR4911 or METR4212 | | 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 | • CSSE3010 | • CSSE4010 |
| • CSSE2002 | • ELEC3004 | • CSSE4011 |
| • CSSE2310 | • MECH3200 | |

Mining Engineering

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

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

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 | • MECH3200 |
| • ELEC3004 | • METR6203 |

Data Science Minor

The data science minor consists of both:

- | | |
|------------|------------|
| • DATA2001 | • INFS1200 |
|------------|------------|

plus two of:

- | | | |
|------------|------------|------------|
| • COMP4702 | • INFS3208 | • STAT2003 |
| • INFS2200 | • INFS4203 | • STAT2004 |



Computing Minor

The computing minor consists of both:

- CSSE2002
- COMP3506

plus two of:

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

Design Minor

The design minor consists of:

- DSGN1500

plus three of:

- DSGN1100
- DSGN2100
- DSGN3100
- DSGN1200
- DSGN2200

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
- MECH3200
- ELEC3004
- METR6203

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

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

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 | METR2800 | |

| Third Year | | | | |
|------------|----------|----------|----------|----------|
| Semester 1 | METR3100 | ELEC2400 | ELEC3004 | METR4201 |
| Semester 2 | METR4810 | MECH3200 | ADVANCED | ADVANCED |

| Fourth Year | | | | |
|-------------|----------|----------|----------|----------|
| Semester 1 | METR4202 | ADVANCED | 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 BEME program, you must take between five and seven of the following courses:

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

Masters Electives

As part of the BEME program, you must take between two and three of the following courses:

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



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
- ELEC4630
- METR6203
- COMP3702
- COMP4702
- COMP3710
- METR4202

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
- MECH3780
- AERO4800
- METR3100
- METR4202
- MECH4950

Software Engineering

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

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



Computer Science

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

- ENGG1300
- COMP3702
- COMP4702
- CSSE2310
- COMP3710







Course Profiles

AERO4300 - Aerospace Composites

AERO4450 - Aerospace Propulsion

AERO4470 - Hypersonics

AERO4800 - Space Engineering

COMP3506 - Algorithms & Data Structures

COMP3702 - Artificial Intelligence

COMP3710 - Pattern Recognition and Analysis

COMP4702 - Machine Learning

COSC2500 - Numerical Methods in Computational Science

COSC3000 - Visualization, Computer Graphics & Data Analysis

COSC3500 - High-Performance Computing

CSSE1001 - Introduction to Software Engi-





Sponsors



Acknowledgments

