Program Code
BEDM5

Program Minimum Units
120

Standard Duration
5 Years

Program Faculty
Faculty of Engineering, Computer and Math Sciences

AQF Level
08

Academic Year
2018

These Program Rules should be read in conjunction with the University's policies (http://www.adelaide.edu.au/policies).

Overview
Through this double degree program students can combine the concepts of electrical and electronic engineering with mathematical and computer sciences. The electrical and electronic program embraces both electrical and electronic engineering and provides graduates with a wide range of fundamental scientific knowledge relevant to electrical and electronic engineering. The mathematical and computer sciences program includes a range of mathematics, statistics and computer science courses.
In addition to the academic program of study, students must complete a total of 12 weeks of full-time practical experience. Graduates of the program qualify for professional membership of Engineers Australia.
The Bachelor of Engineering (Honours) (Electrical and Electronic) / Bachelor of Mathematical and Computer Sciences is an AQF Level 8 qualification with a standard full-time duration of 5 years.

Conditions
Condition of enrolment
Interruption of program: Students must apply for permission from the Executive Dean or delegate before taking a Leave of Absence. Any extension of the leave without approval will result in the loss of place in the program but an application may be made to be re-admitted to the program subject to the admission procedures in place at the time.

Academic Program Rules for Bachelor of Engineering (Honours) (Electrical and Electronic) / Bachelor of Mathematical and Computer Sciences (BE(Hons)(Elec&Elec) BMaCompSc)

There shall be a Bachelor of Engineering (Honours) (Electrical and Electronic) / Bachelor of Mathematical and Computer Sciences (BE(Hons)(Elec&Elec) BMaCompSc).

Qualification Requirements
Academic Program

To qualify for the double degree of Bachelor of Engineering (Honours) (Electrical and Electronic) with Bachelor of Mathematical and Computer Sciences, with either a Computer Science or Mathematics major, the student must complete satisfactorily a program of study consisting of the following requirements with a combined total of not less than 120 units, comprising:

1. Courses to the value of 96 units from the Bachelor of Engineering (Honours) Electrical and Electronic, including Core courses up to the value of 84 units, Elective courses to the value of 3 units and Broadening electives to the value of 9 units, with the option of a major in one of the following:
   - Autonomous Systems
   - Biomedical
   - Communication Systems
   - Computer Engineering
   - Renewable Energy

2. Courses to the value of 24 units from the Bachelor of Mathematical and Computer Sciences, including a Computer Science or Mathematics major

3. A total of 12 weeks practical experience approved by the Faculty and of which a minimum 6 weeks should be under the supervision of a professional engineer

4. Unless exempted, international students are required to take ENG 3003 Engineering Communication EAL in lieu of either a core or elective course as advised by the Faculty

5. Students who have not undertaken SACE Stage 2 Specialist Mathematics (or equivalent) will be required to enrol in Mathematics IM, followed by Mathematics IA with Mathematics IB taken in Summer Semester to complete the Mathematics requirements at Level I. The satisfactory completion of Mathematics IM is in addition to the normal requirements of the Bachelor of Engineering (Honours)

Bachelor of Engineering (Honours) (Electrical and Electronic with Bachelor of Mathematical and Computer Sciences (Computer Science Major)

To satisfy the requirements for Bachelor of Engineering (Honours) (Electrical and Electronic with Bachelor of Mathematical and Computer Sciences (Computer Science Major) students must complete courses to the value of 120 units.

Electrical and Electronic Core

All of the following courses must be completed:

- COMP SCI 1102 Object Oriented Programming (3 units)
- COMP SCI 1201 Introduction to Programming for Engineers (3 units)
- ELEC ENG 1100 Analog Electronics (3 units)
- ELEC ENG 1102 Digital Electronics (3 units)
- ELEC ENG 2100 Digital Systems (3 units)
- ELEC ENG 2101 Electronic Circuits (3 units)
- ELEC ENG 2102 Electric Energy Conversion (3 units)
- ELEC ENG 2103 Design & Innovation (3 units)
- ELEC ENG 2104 Digital Signal Processing (3 units)
- ELEC ENG 3100 Systems Engineering (3 units)
- ELEC ENG 3101 Control (3 units)
- ELEC ENG 3102 Project Management (3 units)
- ELEC ENG 3103 Electromagnetics (3 units)
- ELEC ENG 3104 Electric Drive Systems (3 units)
- ELEC ENG 3105 Real-Time and Embedded Systems (3 units)
- ELEC ENG 3106 Radio Frequency Systems (3 units)
- ELEC ENG 3110 Electric Power Systems (3 units)
- ELEC ENG 4100 Business Management Systems (3 units)
- ELEC ENG 4101A Electrical & Electronic Research Project Part 1 (6 units)
- ELEC ENG 4101B Electrical & Electronic Research Project Part 2 (3 units)
MATHS 1011 Mathematics IA (3 units)
MATHS 1012 Mathematics IB (3 units)
MATHS 2201 Engineering Mathematics IIA (3 units)
MATHS 2202 Engineering Mathematics IIB (3 units)
PHYSICS 1510 Physics IE: Mechanics and Thermodynamics (3 units)

Electrical and Electronic Electives

Courses to the value of 9 units from the following:
COMP SCI 3001 Computer Networks & Applications (3 units)
COMP SCI 3006 Software Engineering & Project (3 units)
ELEC ENG 3109 Digital Microelectronics (3 units)
ELEC ENG 3111 Distributed Generation Technologies (3 units)
ELEC ENG 4058 Power Quality & Condition Monitoring (3 units)
ELEC ENG 4061 Image Processing (3 units)
ELEC ENG 4067 Antennas & Propagation (3 units)
ELEC ENG 4069 Radar Principles & Systems UG (3 units)
ELEC ENG 4115 Biomedical Instrumentation (3 units)

Computer Science Core

Courses to the value of up to 12 units may be taken from the following:
COMP SCI 2000 Computer Systems (3 units)
COMP SCI 2103 Algorithm Design & Data Structures for Engineers (3 units)
COMP SCI 2201 Algorithm & Data Structure Analysis (3 units)
COMP SCI 3006 Software Engineering & Project (3 units)

plus

Computer Science Electives

Level II or III Computer Science Electives (3 units)
Level III Computer Science Electives (9 units)

Computer Science Electives may be chosen from those listed in the Program Rules for the degree of Bachelor of Mathematical and Computer Sciences

Broadening Electives

Students must complete Broadening electives to the value of 9 units. These Broadening electives cannot be chosen from the following subject areas: ELEC ENG, MATHS or COMP SCI.

Bachelor of Engineering (Honours) (Electrical and Electronic) with Bachelor of Mathematical and Computer Sciences (Mathematics Major)

To satisfy the requirements for Bachelor of Engineering (Honours) (Electrical and Electronic) with Bachelor of Mathematical and Computer Sciences (Mathematics Major) students must complete courses to the value of 120 units.

Electrical and Electronic Core

All of the following courses must be completed:
COMP SCI 1102 Object Oriented Programming (3 units)
COMP SCI 1201 Introduction to Programming for Engineers (3 units)
ELEC ENG 1100 Analog Electronics (3 units)
ELEC ENG 1102 Digital Electronics (3 units)
ELEC ENG 2100 Digital Systems (3 units)
ELEC ENG 2101 Electronic Circuits (3 units)
ELEC ENG 2102 Electric Energy Conversion (3 units)
ELEC ENG 2103 Design & Innovation (3 units)
ELEC ENG 2104 Digital Signal Processing (3 units)
ELEC ENG 3100 Systems Engineering (3 units)
ELEC ENG 3101 Control (3 units)
ELEC ENG 3102 Project Management (3 units)
ELEC ENG 3103 Electromagnetics (3 units)
ELEC ENG 3104 Electric Drive Systems (3 units)
ELEC ENG 3105 Real-Time and Embedded Systems (3 units)
ELEC ENG 3106 Radio Frequency Systems (3 units)
ELEC ENG 3110 Electric Power Systems (3 units)
ELEC ENG 4100 Business Management Systems (3 units)
ELEC ENG 4101A Electrical & Electronic Research Project Part 1 (6 units)
ELEC ENG 4101B Electrical & Electronic Research Project Part 2 (3 units)
MATHS 1011 Mathematics IA (3 units)
MATHS 1012 Mathematics IB (3 units)
MATHS 2201 Engineering Mathematics IIA (3 units)
MATHS 2202 Engineering Mathematics IIB (3 units)
PHYSICS 1510 Physics IE: Mechanics and Thermodynamics (3 units)

Electrical and Electronic Electives

Courses to the value of 9 units from the following:
COMP SCI 2103 Algorithm Design & Data Structures for Engineers (3 units)
COMP SCI 3001 Computer Networks & Applications (3 units)
COMP SCI 3006 Software Engineering & Project (3 units)
ELEC ENG 3109 Digital Microelectronics (3 units)
ELEC ENG 3111 Distributed Generation Technologies (3 units)
ELEC ENG 4058 Power Quality & Condition Monitoring (3 units)
ELEC ENG 4061 Image Processing (3 units)
ELEC ENG 4067 Antennas & Propagation (3 units)
ELEC ENG 4069 Radar Principles & Systems UG (3 units)
ELEC ENG 4115 Biomedical Instrumentation (3 units)

Mathematics Electives

Courses to the value of 24 units from the following:
Level II or III Mathematics Electives (12 units)
Level III Mathematics Electives (12 units)

Mathematics Electives may be chosen from those listed in the program rules for the degree of Bachelor of Mathematical and Computer Sciences. Students must complete a major or double in accordance with the Bachelor of Mathematical and Computer Sciences program rules

Broadening Electives

Students must complete Broadening electives to the value of 9 units. These Broadening electives cannot be chosen from the following subject areas: ELEC ENG, MATHS or COMP SCI.

Bachelor of Engineering (Honours) (Electrical and Electronic) (Autonomous Systems Major) with Bachelor of Mathematical and Computer Sciences (Computer Science Major)

To satisfy the requirements for Bachelor of Engineering (Honours) (Electrical and Electronic) (Autonomous Systems Major) with Bachelor of Mathematical and Computer Sciences (Computer Science Major) students must complete courses to the value of 120 units.

Autonomous Systems Core
All of the following courses must be completed:
COMP SCI 1102 Object Oriented Programming (3 units)
COMP SCI 1201 Introduction to Programming for Engineers (3 units)
COMP SCI 2103 Algorithm Design & Data Structures for Engineers (3 units)
COMP SCI 3007 Artificial Intelligence (3 units)
ELEC ENG 1100 Analog Electronics (3 units)
ELEC ENG 1102 Digital Electronics (3 units)
ELEC ENG 2100 Digital Systems (3 units)
ELEC ENG 2101 Electronic Circuits (3 units)
ELEC ENG 2102 Electric Energy Conversion (3 units)
ELEC ENG 2103 Design & Innovation (3 units)
ELEC ENG 2104 Digital Signal Processing (3 units)
ELEC ENG 3100 Systems Engineering (3 units)
ELEC ENG 3101 Control (3 units)
ELEC ENG 3102 Project Management (3 units)
ELEC ENG 3104 Electric Drive Systems (3 units)
ELEC ENG 3105 Real-Time and Embedded Systems (3 units)
ELEC ENG 3107 Autonomous Systems (3 units)
MATHS 1011 Mathematics IA (3 units)
MATHS 1012 Mathematics IB (3 units)
MATHS 2201 Engineering Mathematics IIA (3 units)
MATHS 2202 Engineering Mathematics IIB (3 units)
PHYSICS 1510 Physics IE: Mechanics and Thermodynamics (3 units)

Autonomous Systems Major

All of the following courses must be completed:
ELEC ENG 4100 Business Management Systems (3 units)
ELEC ENG 4102A Autonomous Systems Research Project Pt 1 (6 units)
ELEC ENG 4102B Autonomous Systems Research Project Pt 2 (3 units)

Autonomous Systems Electives

Courses to the value of 9 units from the following:
COMP SCI 3001 Computer Networks & Applications (3 units)
COMP SCI 3014 Computer Graphics (3 units)
COMP SCI 3016 Computational Cognitive Science (3 units)
COMP SCI 4022 Computer Vision (3 units)
ELEC ENG 4061 Image Processing (3 units)

Computer Science Core

All of the following courses must be completed:
COMP SCI 3006 Software Engineering & Project (3 units)
COMP SCI 2201 Algorithm & Data Structure Analysis (3 units)
COMP SCI 2201 Algorithm & Data Structure Analysis (3 units)

Computer Science Electives

Level II or II COMP SCI Electives (6 units)
Level III COMP SCI Electives (9 units)

Computer Science Electives may be chosen from those listed in the Program Rules for the degree of Bachelor of Mathematical and Computer Sciences.

plus
Broadening Electives

Students must complete Broadening electives to the value of 9 units. These Broadening electives cannot be chosen from the following subject areas: ELEC ENG, MATHS or COMP SCI.

Courses to the value of 9 units from the following:

**Bachelor of Engineering (Honours) (Electrical and Electronic) (Autonomous Systems Major) with Bachelor of Mathematical and Computer Sciences (Mathematics Major)**

To satisfy the requirements for Bachelor of Engineering (Honours) (Electrical and Electronic) (Autonomous Systems Major) with Bachelor of Mathematical and Computer Sciences (Mathematics Major) students must complete courses to the value of 120 units.

**Autonomous Systems Core**

All of the following courses must be completed:
- COMP SCI 1102 *Object Oriented Programming* (3 units)
- COMP SCI 1201 *Introduction to Programming for Engineers* (3 units)
- COMP SCI 2103 *Algorithm Design & Data Structures for Engineers* (3 units)
- COMP SCI 3007 *Artificial Intelligence* (3 units)
- ELEC ENG 1100 *Analog Electronics* (3 units)
- ELEC ENG 1102 *Digital Electronics* (3 units)
- ELEC ENG 2100 *Digital Systems* (3 units)
- ELEC ENG 2101 *Electronic Circuits* (3 units)
- ELEC ENG 2102 *Electric Energy Conversion* (3 units)
- ELEC ENG 2103 *Design & Innovation* (3 units)
- ELEC ENG 2104 *Digital Signal Processing* (3 units)
- ELEC ENG 3100 *Systems Engineering* (3 units)
- ELEC ENG 3101 *Control* (3 units)
- ELEC ENG 3102 *Project Management* (3 units)
- ELEC ENG 3103 *Electromagnetics* (3 units)
- ELEC ENG 3104 *Electric Drive Systems* (3 units)
- ELEC ENG 3105 *Real-Time and Embedded Systems* (3 units)
- ELEC ENG 3107 *Autonomous Systems* (3 units)
- MATHS 1012 *Mathematics IB* (3 units)
- MATHS 1011 *Mathematics IA* (3 units)
- MATHS 2201 *Engineering Mathematics IIA* (3 units)
- MATHS 2202 *Engineering Mathematics IIB* (3 units)
- PHYSICS 1510 *Physics IE: Mechanics and Thermodynamics* (3 units)

**Autonomous Systems Major**

All of the following courses must be completed:
- ELEC ENG 4100 *Business Management Systems* (3 units)
- ELEC ENG 4102A *Autonomous Systems Research Project Pt 1* (6 units)
- ELEC ENG 4102B *Autonomous Systems Research Project Pt 2* (3 units)

**Autonomous Systems Electives**

Courses to the value of 6 units from the following:
- COMP SCI 3001 *Computer Networks & Applications* (3 units)
- COMP SCI 3006 *Software Engineering & Project* (3 units)
- COMP SCI 3014 *Computer Graphics* (3 units)
- COMP SCI 3016 *Computational Cognitive Science* (3 units)
- COMP SCI 4022 *Computer Vision* (3 units)
- ELEC ENG 4061 *Image Processing* (3 units)
Mathematics Electives

Courses to the value of 24 units from the following:

Level II or III Mathematics Electives (12 units)
Level III Mathematics Electives (12 units)

Mathematics Electives may be chosen from those listed in the program rules for the degree of Bachelor of Mathematical and Computer Sciences. Students must complete a major or double major in accordance with the Bachelor of Mathematical and Computer Sciences program rules.

Broadening Electives

Students must complete Broadening electives to the value of 9 units. These Broadening electives cannot be chosen from the following subject areas: ELEC ENG, MATHS or COMP SCI.

Bachelor of Engineering (Honours) (Electrical and Electronic) (Biomedical Major) with Bachelor of Mathematical and Computer Sciences (Computer Science Major)

To satisfy the requirements for Bachelor of Engineering (Honours) (Electrical and Electronic) (Biomedical Major) with Bachelor of Mathematical and Computer Sciences (Computer Science Major) students must complete courses to the value of 120 units.

Biomedical Core

All of the following courses must be completed:
COMP SCI 1102 Object Oriented Programming (3 units)
COMP SCI 1201 Introduction to Programming for Engineers (3 units)
ELEC ENG 1100 Analog Electronics (3 units)
ELEC ENG 1102 Digital Electronics (3 units)
ELEC ENG 2100 Digital Systems (3 units)
ELEC ENG 2101 Electronic Circuits (3 units)
ELEC ENG 2102 Electric Energy Conversion (3 units)
ELEC ENG 2103 Design & Innovation (3 units)
ELEC ENG 2104 Digital Signal Processing (3 units)
ELEC ENG 3101 Control (3 units)
ELEC ENG 3102 Project Management (3 units)
ELEC ENG 3103 Electromagnetics (3 units)
ELEC ENG 3106 Radio Frequency Systems (3 units)
ELEC ENG 4115 Biomedical Instrumentation (3 units)
MATHS 1011 Mathematics IA (3 units)
MATHS 1012 Mathematics IB (3 units)
MATHS 2201 Engineering Mathematics IIA (3 units)
MATHS 2202 Engineering Mathematics IIB (3 units)
PHYSICS 1510 Physics IE: Mechanics and Thermodynamics (3 units)
PHYSIOL 2510 Physiology IIA: Heart, Lung & Neuromuscular Systems (3 units)
PHYSIOL 2520 Physiology IIB: Systems & Homeostasis (3 units)

and

Courses to the value of 3 units from the following:
PHYSIOL 3104 Cellular & Systems Neurobiology (3 units)
PHYSIOL 3120 Neuromotor Control of Human Movement (3 units)

Biomedical Major

All of the following courses must be completed:
ELEC ENG 4100 Business Management Systems (3 units)
ELEC ENG 4103A Biomedical Research Project Part 1 (6 units)
ELEC ENG 4103B Biomedical Research Project Part 2 (3 units)

Biomedical Electives

Courses to the value of 6 units from the following:
BIOLOGY 1101 Biology I: Molecules, Genes and Cells (3 units)
BIOLOGY 1201 Biology I: Human Perspectives (3 units)
COMP SCI 4022 Computer Vision (3 units)
ELEC ENG 3104 Electric Drive Systems (3 units)
ELEC ENG 3105 Real-Time and Embedded Systems (3 units)
ELEC ENG 4061 Image Processing (3 units)

Computer Science Core

All of the following courses must be completed:
COMP SCI 3006 Software Engineering & Project (3 units)
COMP SCI 2000 Computer Systems (3 units)
COMP SCI 2103 Algorithm Design & Data Structures for Engineers (3 units)
COMP SCI 2201 Algorithm & Data Structure Analysis (3 units)

Computer Science Electives

Courses to the value of 12 units from the following:

Level II or III Computer Science Electives (3 units)
Level III Computer Science Electives (9 units)

Computer Science Electives may be chosen from those listed in the Program Rules for the degree of Bachelor of Mathematical and Computer Sciences

Broadening Electives

Students must complete Broadening electives to the value of 9 units. These Broadening electives cannot be chosen from the following subject areas: ELEC ENG, MATHS or COMP SCI.

Bachelor of Engineering (Honours) (Electrical and Electronic) (Biomedical Major) with Bachelor of Mathematics and Computer Sciences (Mathematical Major)

To satisfy the requirements for Bachelor of Engineering (Honours) (Electrical and Electronic) (Biomedical Major) with Bachelor of Mathematics and Computer Sciences (Mathematical Major) students must complete courses to the value of 120 units.

Biomedical Core

All of the following courses must be completed:
COMP SCI 1102 Object Oriented Programming (3 units)
COMP SCI 1201 Introduction to Programming for Engineers (3 units)
ELEC ENG 1100 Analog Electronics (3 units)
ELEC ENG 1102 Digital Electronics (3 units)
ELEC ENG 2100 Digital Systems (3 units)
ELEC ENG 2101 Electronic Circuits (3 units)
ELEC ENG 2102 Electric Energy Conversion (3 units)
ELEC ENG 2103 Design & Innovation (3 units)
ELEC ENG 2104 Digital Signal Processing (3 units)
ELEC ENG 3100 Systems Engineering (3 units)
ELEC ENG 3101 Control (3 units)
ELEC ENG 3102 Project Management (3 units)
ELEC ENG 3103 Electromagnetics (3 units)
ELEC ENG 3106 Radio Frequency Systems (3 units)
ELEC ENG 4115 Biomedical Instrumentation (3 units)
MATHS 1011 Mathematics IA (3 units)
MATHS 1012 Mathematics IB (3 units)
MATHS 2201 Engineering Mathematics IIA (3 units)
MATHS 2202 Engineering Mathematics IIB (3 units)
PHYSICS 1510 Physics IE: Mechanics and Thermodynamics (3 units)
PHYSIOI 2510 Physiology IIA: Heart, Lung & Neuromuscular Systems (3 units)
PHYSIOI 2520 Physiology IIB: Systems & Homeostasis (3 units)

and

Courses to the value of 3 units from the following:
PHYSIOI 3104 Cellular & Systems Neurobiology (3 units)
PHYSIOI 3120 Neuromotor Control of Human Movement (3 units)

Biomedical Major

All of the following courses must be completed:
ELEC ENG 4100 Business Management Systems (3 units)
ELEC ENG 4103A Biomedical Research Project Part 1 (6 units)
ELEC ENG 4103B Biomedical Research Project Part 2 (3 units)

Biomedical Electives

Courses to the value of 6 units from the following:
BIOLOGY 1101 Biology I: Molecules, Genes and Cells (3 units)
BIOLOGY 1201 Biology I: Human Perspectives (3 units)
COMP SCI 4022 Computer Vision (3 units)
ELEC ENG 3104 Electric Drive Systems (3 units)
ELEC ENG 3105 Real-Time and Embedded Systems (3 units)
ELEC ENG 4061 Image Processing (3 units)

Mathematics Electives

Courses to the value of 24 units from the following:
Level II or III Mathematics Electives (12 units)
Level III Mathematics Electives (12 units)

Mathematics Electives may be chosen from those listed in the program rules for the degree of Bachelor of Mathematical and Computer Sciences. Students must complete a major or double major in accordance with the Bachelor of Mathematical and Computer Sciences program rules

Broadening Electives

Broadening Electives to the value of 9 units

Students must complete Broadening electives to the value of 9 units. These Broadening electives cannot be chosen from the following subject areas: ELEC ENG, MATHS or COMP SCI.

Bachelor of Engineering (Honours) (Electrical and Electronic) (Communication Systems Major) with Bachelor of Mathematical and Computer Sciences (Computer Science Major)

To satisfy the requirements for Bachelor of Engineering (Honours) (Electrical and Electronic)
(Communication Systems Major) with Bachelor of Mathematical and Computer Sciences (Computer Science Major) students must complete courses to the value of 120 units.

**Communication Systems Core**

All of the following courses must be completed:
- COMP SCI 1102 [Object Oriented Programming](#) (3 units)
- COMP SCI 1201 [Introduction to Programming for Engineers](#) (3 units)
- COMP SCI 2103 [Algorithm Design & Data Structures for Engineers](#) (3 units)
- COMP SCI 3001 [Computer Networks & Applications](#) (3 units)
- ELEC ENG 1100 [Analog Electronics](#) (3 units)
- ELEC ENG 1102 [Digital Electronics](#) (3 units)
- ELEC ENG 2100 [Digital Systems](#) (3 units)
- ELEC ENG 2101 [Electronic Circuits](#) (3 units)
- ELEC ENG 2102 [Electric Energy Conversion](#) (3 units)
- ELEC ENG 2103 [Design & Innovation](#) (3 units)
- ELEC ENG 2104 [Digital Signal Processing](#) (3 units)
- ELEC ENG 3100 [Systems Engineering](#) (3 units)
- ELEC ENG 3101 [Control](#) (3 units)
- ELEC ENG 3102 [Project Management](#) (3 units)
- ELEC ENG 3103 [Electromagnetics](#) (3 units)
- ELEC ENG 3106 [Radio Frequency Systems](#) (3 units)
- ELEC ENG 3108 [Telecommunications Principles](#) (3 units)
- ELEC ENG 4054 [Telecommunications Systems](#) (3 units)
- MATHS 1011 [Mathematics IA](#) (3 units)
- MATHS 1012 [Mathematics IB](#) (3 units)
- MATHS 2201 [Engineering Mathematics IIA](#) (3 units)
- MATHS 2202 [Engineering Mathematics IIB](#) (3 units)
- PHYSICS 1510 [Physics IE: Mechanics and Thermodynamics](#) (3 units)

**Communication Systems Major**

All of the following courses must be completed:
- ELEC ENG 4100 Business Management Systems (3 units)
- ELEC ENG 4104A Communication Systems Research Project Part 1 (6 units)
- ELEC ENG 4104B Communication Systems Research Project Part 2 (3 units)

**Communication Systems Electives**

Courses to the value of up to 6 units may be taken from the following:
- COMP SCI 3007 [Artificial Intelligence](#) (3 units)
- ELEC ENG 3105 [Real-Time and Embedded Systems](#) (3 units)
- ELEC ENG 3109 [Digital Microelectronics](#) (3 units)
- ELEC ENG 4067 [Antennas & Propagation](#) (3 units)

**Computer Science Core**

All of the following courses must be completed:
- COMP SCI 2000 [Computer Systems](#) (3 units)
- COMP SCI 2201 [Algorithm & Data Structure Analysis](#) (3 units)
- COMP SCI 3006 [Software Engineering & Project](#) (3 units)

**Computer Science Electives**

Courses to the value of 15 units from the following:

Level II or III Computer Science Electives (6 units)
Level III Computer Science Electives (9 units)
Computer Science Electives may be chosen from those listed in the Program Rules for the degree of Bachelor of Mathematical and Computer Sciences.

**Broadening Electives**

Students must complete Broadening electives to the value of 9 units. These Broadening electives **cannot** be chosen from the following subject areas: ELEC ENG, MATHS or COMP SCI.

**Bachelor of Engineering (Honours) (Electrical and Electronic) (Communication Systems Major) with Bachelor of Mathematical and Computer Sciences (Mathematics Major)**

To satisfy the requirements for Bachelor of Engineering (Honours) (Electrical and Electronic) (Communication Systems Major) with Bachelor of Mathematical and Computer Sciences (Mathematics Major) students must complete courses to the value of 120 units.

**Communication Systems Core**

All of the following courses must be completed:

- COMP SCI 1102 *Object Oriented Programming* (3 units)
- COMP SCI 1201 *Introduction to Programming for Engineers* (3 units)
- COMP SCI 2103 *Algorithm Design & Data Structures for Engineers* (3 units)
- COMP SCI 3001 *Computer Networks & Applications* (3 units)
- ELEC ENG 1100 *Analog Electronics* (3 units)
- ELEC ENG 1102 *Digital Electronics* (3 units)
- ELEC ENG 2100 *Digital Systems* (3 units)
- ELEC ENG 2101 *Electronic Circuits* (3 units)
- ELEC ENG 2102 *Electric Energy Conversion* (3 units)
- ELEC ENG 2103 *Design & Innovation* (3 units)
- ELEC ENG 2104 *Digital Signal Processing* (3 units)
- ELEC ENG 3100 *Systems Engineering* (3 units)
- ELEC ENG 3101 *Control* (3 units)
- ELEC ENG 3102 *Project Management* (3 units)
- ELEC ENG 3103 *Electromagnetics* (3 units)
- ELEC ENG 3106 *Radio Frequency Systems* (3 units)
- ELEC ENG 3108 *Telecommunications Principles* (3 units)
- ELEC ENG 4054 *Telecommunications Systems* (3 units)
- MATHS 1011 *Mathematics IA* (3 units)
- MATHS 1012 *Mathematics IB* (3 units)
- MATHS 2201 *Engineering Mathematics IIA* (3 units)
- MATHS 2202 *Engineering Mathematics IIB* (3 units)
- PHYSICS 1510 *Physics IE: Mechanics and Thermodynamics* (3 units)

**Communication Systems Major**

All of the following courses must be completed:

- ELEC ENG 4100 *Business Management Systems* (3 units)
- ELEC ENG 4104A *Communication Systems Research Project Part 1* (6 units)
- ELEC ENG 4104B *Communication Systems Research Project Part 2* (3 units)

**Communication Systems Electives**

Courses to the value of 6 units from the following:

- COMP SCI 3007 *Artificial Intelligence* (3 units)
- ELEC ENG 3105 *Real-Time and Embedded Systems* (3 units)
- ELEC ENG 3109 *Digital Microelectronics* (3 units)
- ELEC ENG 4067 *Antennas & Propagation* (3 units)

**Mathematics Electives**
Courses to the value of 24 units from the following:

- Level II or III Mathematics Electives (12 units)
- Level III Mathematics Electives (12 units)

Mathematics Electives may be chosen from those listed in the program rules for the degree of Bachelor of Mathematical and Computer Sciences. Students must complete a major in accordance with the Bachelor of Mathematical and Computer Sciences program rules.

**Broadening Electives**

Broadening Electives to the value of 9 units

Students must complete Broadening electives to the value of 9 units. These Broadening electives cannot be chosen from the following subject areas: ELEC ENG, MATHS or COMP SCI.

**Bachelor of Engineering (Honours) (Electrical and Electronic) (Computer Engineering Major) with Bachelor and Computer Sciences (Computer Science Major)**

To satisfy the requirements for Bachelor of Engineering (Honours) (Electrical and Electronic) (Computer Engineering Major) with Bachelor and Computer Sciences (Computer Science Major) students must complete courses to the value of 120 units.

**Computer Engineering Core**

All of the following courses must be completed:
- COMP SCI 1102 Object Oriented Programming (3 units)
- COMP SCI 1201 Introduction to Programming for Engineers (3 units)
- COMP SCI 2103 Algorithm Design & Data Structures for Engineers (3 units)
- COMP SCI 3001 Computer Networks & Applications (3 units)
- COMP SCI 3005 Computer Architecture (3 units)
- ELEC ENG 1100 Analog Electronics (3 units)
- ELEC ENG 1102 Digital Electronics (3 units)
- ELEC ENG 2100 Digital Systems (3 units)
- ELEC ENG 2101 Electronic Circuits (3 units)
- ELEC ENG 2102 Electric Energy Conversion (3 units)
- ELEC ENG 2103 Design & Innovation (3 units)
- ELEC ENG 2104 Digital Signal Processing (3 units)
- ELEC ENG 3100 Systems Engineering (3 units)
- ELEC ENG 3101 Control (3 units)
- ELEC ENG 3102 Project Management (3 units)
- ELEC ENG 3103 Electromagnetics (3 units)
- ELEC ENG 3105 Real-Time and Embedded Systems (3 units)
- ELEC ENG 3109 Digital Microelectronics (3 units)
- MATHS 1011 Mathematics IA (3 units)
- MATHS 1012 Mathematics IB (3 units)
- MATHS 2201 Engineering Mathematics IIA (3 units)
- MATHS 2202 Engineering Mathematics IIB (3 units)
- PHYSICS 1510 Physics IE: Mechanics and Thermodynamics (3 units)

**Computer Engineering Major**

All of the following courses must be completed:
- ELEC ENG 4100 Business Management Systems (3 units)
- ELEC ENG 4105A Computer Engineering Research Project Part 1 (6 units)
- ELEC ENG 4105B Computer Engineering Research Project Part 2 (3 units)
Computer Engineering Electives

Courses to the value of 6 units from the following:
COMP SCI 3004 Operating Systems (3 units)
COMP SCI 3007 Artificial Intelligence (3 units)
COMP SCI 3014 Computer Graphics (3 units)
ELEC ENG 3104 Electric Drive Systems (3 units)

Computer Sciences Core

All of the following courses must be completed:
COMP SCI 2000 Computer Systems (3 units)
COMP SCI 2201 Algorithm & Data Structure Analysis (3 units)
COMP SCI 3006 Software Engineering & Project (3 units)

Computer Science Electives

Courses to the value of 15 units from the following:
Level II or III Computer Science Electives (6 units)
Level III Computer Science Electives (9 units)

Computer Science Electives may be chosen from those listed in the Program Rules for the degree of Bachelor of Mathematical and Computer Sciences.

Broadening Electives

Students must complete Broadening electives to the value of 9 units. These Broadening electives cannot be chosen from the following subject areas: ELEC ENG, MATHS or COMP SCI.

Bachelor of Engineering (Honours) (Electrical and Electronic) (Computer Engineering Major) with Bachelor of Mathematical and Computer Sciences (Mathematics Major)

To satisfy the requirements for Bachelor of Engineering (Honours) (Electrical and Electronic) (Computer Engineering Major) with Bachelor of Mathematical and Computer Sciences (Mathematics Major) students must complete courses to the value of 120 units.

Computer Engineering Core

All of the following courses must be completed:
COMP SCI 1102 Object Oriented Programming (3 units)
COMP SCI 1201 Introduction to Programming for Engineers (3 units)
COMP SCI 2103 Algorithm Design & Data Structures for Engineers (3 units)
COMP SCI 3001 Computer Networks & Applications (3 units)
COMP SCI 3005 Computer Architecture (3 units)
ELEC ENG 1100 Analog Electronics (3 units)
ELEC ENG 1102 Digital Electronics (3 units)
ELEC ENG 2100 Digital Systems (3 units)
ELEC ENG 2101 Electronic Circuits (3 units)
ELEC ENG 2102 Electric Energy Conversion (3 units)
ELEC ENG 2103 Design & Innovation (3 units)
ELEC ENG 2104 Digital Signal Processing (3 units)
ELEC ENG 3100 Systems Engineering (3 units)
ELEC ENG 3101 Control (3 units)
ELEC ENG 3102 Project Management (3 units)
ELEC ENG 3103 Electromagnetics (3 units)
ELEC ENG 3105 Real-Time and Embedded Systems (3 units)
ELEC ENG 3109 Digital Microelectronics (3 units)
MATHS 1012 Mathematics IB (3 units)
MATHS 1011 Mathematics IA (3 units)
MATHS 2201 Engineering Mathematics IIA (3 units)
MATHS 2202 Engineering Mathematics IIB (3 units)
PHYSICS 1510 Physics IE: Mechanics and Thermodynamics (3 units)

Computer Engineering Major

All of the following courses must be completed:
ELEC ENG 4100 Business Management Systems (3 units)
ELEC ENG 4105A Computer Engineering Research Project Part 1 (6 units)
ELEC ENG 4105B Computer Engineering Research Project Part 2 (3 units)

Computer Engineering Electives

Courses to the value of 6 units from the following:
COMP SCI 3004 Operating Systems (3 units)
COMP SCI 3006 Software Engineering & Project (3 units)
COMP SCI 3007 Artificial Intelligence (3 units)
COMP SCI 3014 Computer Graphics (3 units)
ELEC ENG 3104 Electric Drive Systems (3 units)

Mathematic Electives

Courses to the value of 24 units from the following:

Level II or III Mathematics Electives (12 units)
Level III Mathematics Electives (12 units)

Mathematics Electives may be chosen from those listed in the program rules for the degree of Bachelor of Mathematical and Computer Sciences. Students must complete a major or double major in accordance with the Bachelor of Mathematical and Computer Sciences program rules.

Broadening Electives

Broadening Electives to the value of 9 units

Students must complete Broadening electives to the value of 9 units. These Broadening electives cannot be chosen from the following subject areas: ELEC ENG, MATHS or COMP SCI.

Bachelor of Engineering (Honours) (Electrical and Electronic) (Renewable Energy Major) with Bachelor of Mathematical and Computer Sciences (Computer Science Major)

To satisfy the requirements for Bachelor of Engineering (Honours) (Electrical and Electronic) (Renewable Energy Major) with Bachelor of Mathematical and Computer Sciences (Computer Science Major) students must complete courses to the value of 120 units.

Renewable Energy Core

All of the following courses must be completed:
COMP SCI 1102 Object Oriented Programming (3 units)
COMP SCI 1201 Introduction to Programming for Engineers (3 units)
ELEC ENG 1100 Analog Electronics (3 units)
ELEC ENG 1102 Digital Electronics (3 units)
ELEC ENG 2100 Digital Systems (3 units)
ELEC ENG 2101 Electronic Circuits (3 units)
Bachelor of Engineering (Honours) (Electrical and Electronic) / Bachelor of Mathematical and Computer Sciences

ELEC ENG 2102 **Electric Energy Conversion** (3 units)
ELEC ENG 2103 **Design & Innovation** (3 units)
ELEC ENG 2104 **Digital Signal Processing** (3 units)
ELEC ENG 3100 **Systems Engineering** (3 units)
ELEC ENG 3101 **Control** (3 units)
ELEC ENG 3102 **Project Management** (3 units)
ELEC ENG 3103 **Electromagnetics** (3 units)
ELEC ENG 3104 **Electric Drive Systems** (3 units)
ELEC ENG 3110 **Electric Power Systems** (3 units)
ELEC ENG 3111 **Distributed Generation Technologies** (3 units)
ENTREP 3006 **Energy Management, Economics & Policy** (3 units)
MATHS 1011 **Mathematics IA** (3 units)
MATHS 1012 **Mathematics IB** (3 units)
MATHS 2201 **Engineering Mathematics IIA** (3 units)
MATHS 2202 **Engineering Mathematics IIB** (3 units)
PHYSICS 1510 **Physics IE: Mechanics and Thermodynamics** (3 units)

**Renewable Energy Major**

All of the following courses must be completed:
ELEC ENG 4100 **Business Management Systems** (3 units)
ELEC ENG 4106A **Renewable Energy Research Project Part 1** (6 units)
ELEC ENG 4106B **Renewable Energy Research Project Part 2** (3 units)

**Renewable Energy Electives**

Courses to the value of 9 units from the following:
ELEC ENG 3105 **Real-Time and Embedded Systems** (3 units)
ELEC ENG 3106 **Radio Frequency Systems** (3 units)
ELEC ENG 3108 **Telecommunications Principles** (3 units)
ELEC ENG 3109 **Digital Microelectronics** (3 units)
ELEC ENG 4058 **Power Quality & Condition Monitoring** (3 units)
MECH ENG 4144 **Renewable Fluid Power Technology** (3 units)
MECH ENG 4145 **Sustainable Thermal Technologies** (3 units)

**Computer Science Core**

All of the following courses must be completed:
COMP SCI 2000 **Computer Systems** (3 units)
COMP SCI 2103 **Algorithm Design & Data Structures for Engineers** (3 units)
COMP SCI 2201 **Algorithm & Data Structure Analysis** (3 units)
COMP SCI 3006 **Software Engineering & Project** (3 units)

**Computer Science Electives**

Courses to the value of 12 units from the following:

Level II or III Computer Science Electives (3 units)
Level III Computer Science Electives (9 units)

Computer Science Electives may be chosen from those listed in the Program Rules for the degree of Bachelor of Mathematical and Computer Sciences.

**Broadening Electives**

Students must complete Broadening electives to the value of 9 units. These Broadening electives cannot be chosen from the following subject areas: ELEC ENG, MATHS or COMP SCI.
Bachelor of Engineering (Honours) (Electrical and Electronic) (Renewable Energy Major) with Bachelor of Mathematical and Computer Sciences (Mathematics Major)

To satisfy the requirements for Bachelor of Engineering (Honours) (Electrical and Electronic) (Renewable Energy Major) with Bachelor of Mathematical and Computer Sciences (Mathematics Major) students must complete courses to the value of 120 units.

Renewable Energy Core

All of the following courses must be completed:
- COMP SCI 1102 Object Oriented Programming (3 units)
- COMP SCI 1201 Introduction to Programming for Engineers (3 units)
- ELEC ENG 1100 Analog Electronics (3 units)
- ELEC ENG 1102 Digital Electronics (3 units)
- ELEC ENG 2100 Digital Systems (3 units)
- ELEC ENG 2101 Electronic Circuits (3 units)
- ELEC ENG 2102 Electric Energy Conversion (3 units)
- ELEC ENG 2103 Design & Innovation (3 units)
- ELEC ENG 2104 Digital Signal Processing (3 units)
- ELEC ENG 3100 Systems Engineering (3 units)
- ELEC ENG 3101 Control (3 units)
- ELEC ENG 3102 Project Management (3 units)
- ELEC ENG 3103 Electromagnetics (3 units)
- ELEC ENG 3104 Electric Drive Systems (3 units)
- ELEC ENG 3110 Electric Power Systems (3 units)
- ELEC ENG 3111 Distributed Generation Technologies (3 units)
- ENTREP 3006 Energy Management, Economics & Policy (3 units)
- MATHS 1011 Mathematics IA (3 units)
- MATHS 1012 Mathematics IB (3 units)
- MATHS 2201 Engineering Mathematics IIA (3 units)
- MATHS 2202 Engineering Mathematics IIB (3 units)
- PHYSICS 1510 Physics IE: Mechanics and Thermodynamics (3 units)

Renewable Energy Major

All of the following courses must be completed:
- ELEC ENG 4100 Business Management Systems (3 units)
- ELEC ENG 4106A Renewable Energy Research Project Part 1 (6 units)
- ELEC ENG 4106B Renewable Energy Research Project Part 2 (3 units)

Renewable Energy Electives

Courses to the value of 9 units from the following:
- ELEC ENG 3105 Real-Time and Embedded Systems (3 units)
- ELEC ENG 3106 Radio Frequency Systems (3 units)
- ELEC ENG 3108 Telecommunications Principles (3 units)
- ELEC ENG 3109 Digital Microelectronics (3 units)
- ELEC ENG 4058 Power Quality & Condition Monitoring (3 units)
- MECH ENG 4144 Renewable Fluid Power Technology (3 units)
- MECH ENG 4145 Sustainable Thermal Technologies (3 units)

Mathematics Major

Courses to the value of 24 units from the following:

Level II or III Mathematics Electives (12 units)
Level III Mathematics Electives (12 units)

Mathematics Electives may be chosen from those listed in the program rules for the degree of
Bachelor of Mathematical and Computer Sciences. Students must complete a major or double major in accordance with the Bachelor of Mathematical and Computer Sciences program rules.

**Broadening Electives**

Students must complete Broadening electives to the value of 9 units. These Broadening electives **cannot** be chosen from the following subject areas: ELEC ENG, MATHS or COMP SCI.

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