4638 Bachelor of Science and Bachelor of Engineering (Honours) 2015

Electrical and Computer Systems Engineering

Stage one: **(48 credit points)**

Sem 1	ENG1002 engineering design: cleaner, safer, smarter	PHS1011 Physics (or PHS1080 Foundation physics)	MTH1020 Analysis of change or MTH1030 Techniques for modelling *(see Notes)*	Stage 1 Science sequence as outlined below
Sem 2	ENG1060 Computing for engineers	PHS1022 Physics	MTH1030 Techniques for modelling or MTH2010 Multivariable calculus	Stage 1 Science sequence as outlined below

Stage two **(48-54 credit points)**

Sem 1	ECE2011 Signal processing	MTH2021 Linear algebra with applications	Stage 2 sequence as outlined below	Stage 2 sequence as outlined below
Sem 2	ECE2072 Digital systems	ENG2092 Advanced engineering mathematics B	MTH2032 Differential equations with modelling	Stage 2 sequence as outlined below
			MTH2010 Multivariable calculus *(if not taken at stage one)*	

Stage three **(48 credit points)**

Sem 1	ECE2041 Telecommunications	Stage 3 sequence (ECE unit) as outlined below	Science major as outlined below	Science major as outlined below
Sem 2	ECE2031 Circuits and control	Stage 3 sequence (ECE unit) as outlined below	Science major as outlined below	Science major as outlined below

Stage four **(48 credit points)**

Sem 1	Stage 4 sequence as outlined below	Stage 4 sequence as outlined below	Stage 4 sequence as outlined below	Stage 4 sequence as outlined below
Sem 2	ECE3091 engineering design	Stage 4 sequence as outlined below	Stage 4 sequence as outlined below	Stage 4 sequence as outlined below

Stage five **(48 credit points)**

Sem 1	ECE4094 Project A	ECE4099 Professional practice	Stage 5 sequence as listed below	Stage 5 sequence as listed below
Sem 2	ECE4095Project B	ECE3051 Electrical energy systems	ECE3062 Electronic systems and control	Stage 5 sequence as listed below

Stage 1 science units:

Select one pair:

- ASP1010 Earth to cosmos – introductory astronomy and ASP1022 Life and the universe
- BIO1011 Biology and BIO1022 Biology II
- CHM1011 Chemistry I or CHM1051 Chemistry I advanced and CHM1022 chemistry II or CHM1052 Chemistry II advanced
- ESC1011 Planet earth: Our place in the universe and ESC1022 Planet earth, Surface processes
- FIT1029 Algorithmic problem solving and FIT1040 Programming fundamentals
- STA1010 Statistical methods for science and MAT1830 Discrete mathematics for computer science

Stage 2 sequences (select one sequence to undertake through the degree):

Generic sequence:

- ECE2071 Computer organisation and programming, or ECE2061 Analogue electronics (if FIT1029/FIT1040 taken at stage one)
- PHS2011 Physics: Quantum concepts and technologies
- PHS2022 Physics for communications and measurement

Computer science sequence:

- ECE2061 Analogue electronics
- FIT1008 Introduction to computer science
- FIT2004 Algorithms and data structures

Physiology/biomedical sequence:

- ECE2071 Computer organisation and programming, or ECE2061 Analogue electronics (if FIT1029/FIT1040 taken at stage one)
- PHY2011 Neuroscience of sensory and control systems in the body
- One of: PHY2032 Endocrine control systems or PHY2042 Body systems physiology

4638 Bachelor of Science and Bachelor of Engineering (Honours) 2015

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Stage 3 sequences:

Generic sequence:

- ECE2061 Analogue electronics or ECE3073 Computer systems(if FIT1029/FIT1040 taken at stage one
- ECE3022 wireless and guided EM
- 24 points of approved science units to complete a major in science

Computer science sequence:

- ECE2021 Electromagnetism
- ECE3073 Computer systems
- 24 points of computer science units to complete a major in computer science, including FIT2014, FIT3139, FIT3143 and one of FIT3036, FIT3042, FIT3080, FIT3088, FIT3140 or MTH3051. Refer to Computational science area of study at: (www.monash.edu.au/pubs/2015 handbook/aos/computational-science/).

Physiology/biomedical sequence:

- ECE2021 Electromagnetism
- ECE2061 Analogue electronics or ECE3073 Computer systems (if FIT029/FIT1040 taken at stage one)

Select four units from:

- PHY3012 Integrative neuroscience
- PHY3072 Muscle and exercise
- PHY3102 nutrition, metabolism and body weight
- PHY3111 Sensation and movement
- PHY3171 clinical and experimental cardiovascular physiology
- PHY3181 Hormones and reproduction
- PHY3990 Action in physiology research project

Stage 4 sequences:

Generic sequence:

- ECE3073 computer systems or one 6 point elective from the ECSE electives as listed below (If ECE3073 already taken)
- 12 credit points from the ECSE electives as listed below
- 24 points of approved science units to complete a second major or an extended major in science

Computer science sequence:

- ECE3022 Wireless and guided EM
- ECE3093 Optimisation estimation and numerical methods
- 6 credit points from the ECSE elective list below
- 24 points of approved science units to complete either a major in mathematics or an extended major in computer science.

Physiology/biomedical sequence:

- ECE3022 Wireless and guided EM
- ECE3073 computer systems or one 6 point elective from the ECSE elective as listed below (if ECE3073 already taken)
- ECE3093 Optimisation estimation and numerical methods
- 12 credit point from the ECSE electives as listed below
- 12 points of biomedical engineering units from the list below.

Stage 5 sequences:

Generic sequence:

- ECE3093 Optimisation estimation and numerical methods
- 12 points from the ECSE electives as listed below

Computer science sequence:

- 18 points from the ECSE electives as listed below

Physiology/biomedical sequence:

- 6 points from the ECSE electives as listed below
- 12 points of biomedical engineering units from the list below

Electrical & Computer Systems Engineering electives:

ECE4012 Applied digital signal processing
ECE4023 Radio frequency electronics
ECE4024 Wireless communications
ECE4032 Advanced control
ECE4033 Industrial instrumentation and measurement technologies
ECE4042 Communications theory
ECE4043 optical communications
ECE4044 Telecommunications protocols
ECE4045 Network performance
ECE4053 Electrical energy – generation and supply
ECE4054 Electrical energy- power converters and motor control
ECE4055 Electrical energy – power electronic applications
ECE4058 Electrical energy – high voltage engineering
ECE4063 Large scale digital design
ECE4064 Electronic test technology
ECE4074 Advanced computer architecture
ECE4075 Real time embedded systems
ECE4076 Computer vision
ECE4077 Advanced computing techniques
ECE4078 Intelligent robotics
ECE4081 Medical instrumentation
ECE4084 Biomechanics of human musculo skeletal systems
ECE4086 Medical imaging technology
ECE4087 Medical technology innovation
ECE4808 Organic electronics and micro devices
ECE4809 Solid state lighting
ENG4700 engineering technology for biomedical imaging and sensing

TRC3500 Sensors and artificial perception

ECE5881 Real-time system design*
ECE5882 Advanced electronics design*
ECE5883 Advanced signal processing*
ECE5884 Wireless communications*

*ECE5xxx are available as ECSE electives by approval of the Head of Department of Electrical and Computer Systems for students who have completed either ECE3091 or 132 credit points and have an Honours Weighted Average of 70% or higher.

Note that not all units will be taught in any year and many will be offered only in alternate years

4638 Bachelor of Science and Bachelor of Engineering (Honours) 2015
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Biomedical engineering electives:	
ECE4081 medical instrumentation ECE4084 Biomechanics of human musculo-skeletal systems ECE4086 Medical imaging technology ECE4087 Medical technology innovation	ENG4700 engineering technology for biomedical imaging and sensing MTE2548 Biomaterials I MTE4596 Biomaterials II *If a biomedical unit is not offered in a particular semester, then another ECSE elective may be taken subject to Head of Department approval*

Notes:

Choosing the right level one maths unit	The choice of either MTH1020 and MTH1030 or MTH1030 and MTH2010 at stage one is determined by the level of preparation from VCE studies,
MTH2032	Students who complete a major or extended major in mathematics do not need to overload at stage two but rather complete the unit at stage three
Overloading	Students will normally expect to complete the course in five years In some cases, overloading may also be required to meet Science requirements – please seek advice from the Faculty of Science. Overloading is not compulsory, students may choose to complete in 5 ½ years.
Credit points	Unless specified, all units are worth 6 credit points **Bachelor of Engineering (Generic + Computer science streams)** 22 units x 6cp = **Total of 132 credit points** **Bachelor of Science** 18 units x 6cp = **Total of 108 credit points** **Bachelor of Engineering (physiology/biomedical streams)** 26 units x 6cp = **Total of 156 credit points** **Bachelor of Science** 14 units x 6cp = **Total of 84 credit points**
Unit requisites	All pre-requisite and co-requisite requirements must be undertaken in order to be able to enrol into a specific unit
Duration of degree	5 years full-time, 10 years part-time
Time limit	Time limit = 10 years. Students have ten years in which to complete this award from the time they commence first year. Periods of intermission are counted as part of the ten years.
Course advice	www.eng.monash.edu.au/current-students/course-advice.html http://monash.edu/science/current/undergraduate/help/
Monash handbook	Students should follow the course requirements for the year the course was commenced http://monash.edu/pubs/2015handbooks/courses/index-byfaculty-eng.html

All information correct at publication but may be subject to change – 15 November 2014
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