

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

Materials Engineering

Stage one: (48 credit points)

Sem 1	Level one engineering unit from level one list below	Science unit from level one list below	Science unit from level one list below	Mathematics unit from level one list below
Sem 2	ENG1060 Computing for engineers	Science unit from level one list below	Science unit from level one list below	Mathematics unit from level one list below

Stage two (48 credit points)

Sem 1	MTH2021 Linear algebra with applications	Stage 2 sequence as outlined below	Stage 2 sequence as outlined below	Stage 2 sequence as outlined below
Sem 2	MTH2032 Differential equations with modelling and MTH2010 Multivariable calculus (if not taken at stage one)	Stage 2 sequence as outlined below	Stage 2 sequence as outlined below	Stage 2 sequence as outlined below

Stage three (48 credit points)

Sem 1	MTE2546 Mechanics of materials	Stage 3 sequence as outlined below	Stage 3 sequence as outlined below	Stage 3 sequence as outlined below
Sem 2	MTE2547 Structure-property relationships in materials	Stage 3 sequence as outlined below	Stage 3 sequence as outlined below	Stage 3 sequence 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	MTE2548 Biomaterials I	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	MTE4525 Project I	MTE4571 Materials engineering design and practice	MTE4572 Polymer/composite processing and engineering	Stage 5 sequence as listed below
Sem 2	MTE4526 Project II	MTE4573 Processing and engineering of metals and ceramics	Stage 5 sequence as listed below	Stage 5 sequence as listed below

Core units are included above in the course map. Sequence and elective information is provided below.

Stage 1 units:

All students must complete ENG1060

Select one unit from:

ENG1001 engineering design: lighter, faster, stronger

ENG1002 Engineering design: cleaner, safer, smarter (recommended)

ENG1003 Engineering mobile apps

Select one pair of science units from:

CHM1011 Chemistry or CHM1051 Chemistry I advanced, plus CHM1022 Chemistry or CHM1052 Chemistry II advanced

PHS1011 Physics (or PHS1080 Foundation physics) and PHS1022 Physics

Select one pair of mathematics units from:

MTH1020 Analysis of change and MTH1030 Techniques for modelling or

MTH1030 Techniques for modelling and MTH2010 Multivariable calculus

Select one pair of science units from:

ASP1010 Earth to cosmos – introductory astronomy and ASP1022 life and the universe

BIO1011 Biology I and BIO1022 Biology II

CHM1011 chemistry I or CHM1061 Chemistry I advanced, plus CHM1022 chemistry II or CHM1052 Chemistry II advanced (if this pair has not already been taken)

ESC1011 Planet earth: our place in the universe and ESC1022 Planet earth; Surface processes

FIT1029 Algorithmic problem solving and FIT1040 programming fundamentals

PHS1011 Physics (or PHS1080 foundation physics) and PHS1022 Physics (if this pair has not already been taken)

STA1010 Statistical methods for science and MAT1830 Discrete mathematics for computer science

Stage 2 sequences:**Generic sequence:**

MTE2541 Crystal structures, thermodynamics and phase equilibria
 MTE2542 Microstructural development
 MTE2544 functional materials
 MTE2545 Polymers and ceramics I
 Generic sequence continued:
 12 point level two science sequence in a different science discipline other than mathematics and statistics

Materials science sequence:

MTE2541 Crystal structures, thermodynamics and phase equilibria
 MTE2542 Microstructural development
 24 points of science units

Stage 3 sequences:**Generic sequence:**

MTE3545 Functional materials and devices
 6 point level three materials engineering core unit from the list below.
 24 points of approved science units to complete a major in science

Major sequence in materials science:

MTE2545 Polymers and ceramics I
 24 points of approved science units to complete a major in science
Select 6 points towards the materials science major sequence from:
 MTE2544 functional materials
 MTE3542 Microstructural design in structural materials
 MTE3547 Materials characterisation and modelling

Stage 4 sequences:**Generic sequence:**

MTE3541 Materials durability
 MTE3542 Microstructural design in structural materials
 6 point level-three materials engineering core unit from the list below
 24 points of approved science units to complete a second major or an extended major in science

Major sequence in materials science:

MTE3543 Microstructure to applications: The mechanics of materials
 MTE3544 management and practice in materials engineering
 MTE3546 Polymers and ceramics II
 12 points towards the materials science major sequence:

- MTE3541 Materials durability
- MTE3545 Functional materials and devices, or one 6 point elective in materials engineering from the list below

Plus two of the following units (one will have been completed at stage three already) where one unit counts towards the material science major sequence and one unit towards the materials engineering component:
 MTE2544 functional materials
 MTE3542 Microstructural design in structural materials
 MTE3547 Materials characterisation and modelling

Stage 5 sequences:**Generic sequence:**

12 points of level three materials engineering core units
 6 point materials engineering elective

Major sequence in materials science:

MTE3545 Functional materials and devices (if not already completed) or one 6 point materials engineering elective
 12 points of electives in materials engineering (students taking the biomaterials sequence can choose relevant electives and a project)

Level three materials core units:

MTE3541 Materials durability
 MTE3542 Microstructural design in structural materials
 MTE3543 Microstructure to applications: the mechanics of materials
 MTE3544 management and practice in materials engineering

MTE3545 functional materials and devices
 MTE3546 Polymers and ceramics II
 MTE3547 Materials characterisation and modelling

Materials electives

MTE4590 Modelling of materials
 MTE4592 Advanced ceramics and applications
 MTE4593 Materials and environment
 MTE4594 engineering alloys processing, design and selection

MTE4596 Biomaterials
 MTE4597 Engineering with nanomaterials
 MTE4598 Electron microscopy
 MTE5883 Environmental durability and protection of metals and engineering materials*
 MTE5884 Materials for energy technologies*

*These units can only be taken by students achieving an Honours Weighted Average of 70 per cent and over in their final year.

Notes:

Credit points	Unless specified, all units are worth 6 credit points – total required = 240cp Bachelor of Engineering: Generic sequence: 22 units x 6cp = Total of 132 credit points Materials Science sequence: 18 units x 6cp = 108 credit points Bachelor of Science: Generic sequence: 18 units x 6cp = Total of 108 credit points Materials Science sequence: 22 units x 6cp = 132 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	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
Monash handbook	Students should follow the course requirements for the year the course was commenced www.monash.edu.au/pubs/handbooks/undergrad/eng-courses.html

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

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