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

## Materials Engineering

### Stage one:

<table>
<thead>
<tr>
<th>Sem</th>
<th>Level one engineering unit from level one list below</th>
<th>Science unit from level one list below</th>
<th>Science unit from level one list below</th>
<th>Mathematics unit from level one list below</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>ENG1060 Computing for engineers</td>
<td>Science unit from level one list below</td>
<td>Science unit from level one list below</td>
<td>Mathematics unit from level one list below</td>
</tr>
</tbody>
</table>

### Stage two

<table>
<thead>
<tr>
<th>Sem</th>
<th>MTH2021 Linear algebra with applications</th>
<th>Stage 2 sequence as outlined below</th>
<th>Stage 2 sequence as outlined below</th>
<th>Stage 2 sequence as outlined below</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>MTH2032 Differential equations with modelling and MTH2010 Multivariable calculus (if not taken at stage one)</td>
<td>Stage 2 sequence as outlined below</td>
<td>Stage 2 sequence as outlined below</td>
<td>Stage 2 sequence as outlined below</td>
</tr>
</tbody>
</table>

### Stage three

<table>
<thead>
<tr>
<th>Sem</th>
<th>MTE2546 Mechanics of materials</th>
<th>Stage 3 sequence as outlined below</th>
<th>Stage 3 sequence as outlined below</th>
<th>Stage 3 sequence as outlined below</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>MTE2547 Structure-property relationships in materials</td>
<td>Stage 3 sequence as outlined below</td>
<td>Stage 3 sequence as outlined below</td>
<td>Stage 3 sequence as outlined below</td>
</tr>
</tbody>
</table>

### Stage four

<table>
<thead>
<tr>
<th>Sem</th>
<th>Stage 4 sequence as outlined below</th>
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</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>MTE2548 Biomaterials I</td>
<td>Stage 4 sequence as outlined below</td>
<td>Stage 4 sequence as outlined below</td>
<td>Stage 4 sequence as outlined below</td>
</tr>
</tbody>
</table>

### Stage five

<table>
<thead>
<tr>
<th>Sem</th>
<th>MTE4525 Project I</th>
<th>MTE4571 Materials engineering design and practice</th>
<th>MTE4572 Polymer/composite processing and engineering</th>
<th>Stage 5 sequence as listed below</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>MTE4526 Project II</td>
<td>MTE4573 Processing and engineering of metals and ceramics</td>
<td>Stage 5 sequence as listed below</td>
<td>Stage 5 sequence as listed below</td>
</tr>
</tbody>
</table>

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 II or CHM1052 Chemistry II advanced (if this pair has not already been taken)
  - 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 paid 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

**Materials science sequence:**
- MTE2541 Crystal structures, thermodynamics and phase equilibria
- MTE2542 Microstructural development
- 24 points of science units

**Generic sequence continued:**
- 12 point level two science sequence in a different science discipline other than mathematics and statistics

### 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:

<table>
<thead>
<tr>
<th>Credit points</th>
<th>Unless specified, all units are worth 6 credit points – total required = 240cp</th>
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<tbody>
<tr>
<td><strong>Bachelor of Engineering:</strong> Generic sequence: 22 units x 6cp = Total of 132 credit points</td>
<td></td>
</tr>
<tr>
<td><strong>Materials Science sequence:</strong> 18 units x 6cp = 108 credit points</td>
<td></td>
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<tr>
<td><strong>Bachelor of Science:</strong> Generic sequence: 18 units x 6cp = Total of 108 credit points</td>
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<td><strong>Materials Science sequence:</strong> 22 units x 6cp = 132 credit points</td>
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<table>
<thead>
<tr>
<th>Unit requisites</th>
<th>All pre-requisite and co-requisite requirements must be undertaken in order to be able to enrol into a specific unit</th>
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</table>

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<tr>
<th>Duration of degree</th>
<th>5 years full-time, 10 years part-time</th>
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<tr>
<th>Time limit</th>
<th>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.</th>
</tr>
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</table>

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<tr>
<th>Monash handbook</th>
<th>Students should follow the course requirements for the year the course was commenced <a href="http://www.monash.edu.au/pubs/handbooks/undergrad/eng-courses.html">www.monash.edu.au/pubs/handbooks/undergrad/eng-courses.html</a></th>
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All information correct at publication but may be subject to change – October 2014

Faculty of Engineering, Monash University

CRICOS code 017107E