Attention: Take note of the changes with effect from AY25/26 Sem 1 (For cohort AY2022/2023 to AY2024/2025) ***Click here for more details***

Bachelor of Engineering (Materials Science & Engineering)

Overview

At the undergraduate level, the Department of Materials Science & Engineering offers a four-year engineering curriculum leading to a Bachelor of Engineering degree in Materials Science and Engineering (MSE). This is a professional engineering programme, which prepares students for work as a Materials Engineer in different industries and for further study for postgraduate degrees.

This programme consists of many components – University Level Requirements, Unrestrictive Electives, Engineering Core Courses Requirements, and MSE Programme Requriemetns, in order to provide a broad education. The Common and Major Requirements are well-balanced in science, general engineering, and materials science and engineering. MSE graduates will have a solid science foundation, basic engineering background and sound knowledge in materials science and engineering.

Degree Requirements

The following are the requirements for the degree of B.Eng. (Materials Science and Engineering):

All Students

- Students should **not read more than 60 units of level 1000 courses** towards their degree requirements.
- Satisfy all other requirements as prescribed by the College of Design and Engineering or the University.
- A student must also satisfy other additional requirements that may be prescribed by the College of Design and Engineering or the University.

Table 1: Summary of MSE Course Requirements and Credits for A-Level Intake

Course Requirements	Units
COMMON CURRICULUM REQUIREMENTS [1]	**60**
Singapore Studies	4
Cultures and Connections	4
Communities and Engagement	4
Critique and Expression	4
Digital Literacy	4
Data Literacy	4
Design Thinking	4
Maker Space	4
Systems Thinking	4
Artificial Intelligence	4
Sustainable Futures	4
Creating Narratives	4
Project Management	4
Integrated Project	8
MAJOR REQUIREMENTS	**60**
Engineering Core	**20**
MA1511 Engineering Calculus	2
MA1512 Differential Equations for Engineering	2

MA1513 Linear Algebra with Differential Equations	2
CE2407A Uncertainty Analysis for Engineers	2
EG2401A Engineering Professionalism	2
EG3611A Industrial Attachment [4]	10
Major Programme	40
MLE1001B Materials Science & Engineering Principles & Practice I [5]	4
MLE2001A Materials Science & Engineering Principles & Practice II [5]	4
MLE2102 Thermodynamics and Renewable Energy Technologies	4
MLE2103A Materials Kinetics & Processing	2
MLE2105 Electronic Properties of Materials	4
MLE3101A Materials Characterization	3
MLE3101 Materials Characterization Laboratory	3
MLE3103 Materials Design: Aerospace to Biomedical Applications	4
MLE3111A Materials Properties and Processing Laboratory	2
MLE3112 Machine Learning Approaches in Materials Laboratory	2
Two Technical Elective at any level (3000--5000) [2]	8
UNRESTRICTED ELECTIVES	**40**
Build Your Own Degree [3]	
TOTAL	**160**

[1] See Table 3

[2] See Table 4

[3] See https://www.eng.nus.edu.sg/mse/undergraduate/build-your-own-degree/.

[4] EG3611A can be replaced by:
EG3612 Vacation Industrial attachment (6 Units) + either
CFG2101 NUS Vacation Internship Programme (4 Units) or
EG2605/CDE2605 Undergraduate Research Opportunity Programme (4 Units) or
CDE2605R Undergraduate Research Experience (4 Units)

[5] - Students from other Engineering majors who transfer into MSE are allowed to map the Gateway courses taken in their previous Engineering majors to the Gateway courses in MSE (MLE1001B and MLE2001A).
- One level 1000 Gateway course can be mapped to the level 1000 MSE Gateway course (MLE1001B) and one level 2000 Gateway course can be mapped to the level 2000 MSE Gateway course (MLE2001A). Exception for Environmental Engineering which has two level 2000 Gateway courses. ESE2101 can be mapped to level 1000 MSE Gateway course (MLE1001B), ESE2102 can be mapped to the level 2000 MSE Gateway course (MLE2001A).
- Students who are not taking MLE2001A due to mapping from other level 2000 Gateway course are required to take MLE2301 Introduction to Materials, which will count as a technical elective.

Table 2: Summary of MSE Course Requirements and Credits for Poly Intake

Course Requirements	Units
COMMON CURRICULUM REQUIREMENTS [1]	**52**
Singapore Studies	4
Cultures and Connections	4
Communities and Engagement	4
Critique and Expression	4
Digital Literacy	4
Data Literacy	4
Systems Thinking	4
Artificial Intelligence	4
Sustainable Futures	4
Creating Narratives	4
Project Management	4
Integrated Project	8
MAJOR REQUIREMENTS	**50**
Engineering Core	**10**
MA1511 Engineering Calculus	2
MA1512 Differential Equations for Engineering	2
MA1513 Linear Algebra with Differential Equations	2
CE2407A Uncertainty Analysis for Engineers	2
EG2401A Engineering Professionalism	2
Major Programme	40
MLE1001B Materials Science & Engineering Principles & Practice I [4]	4
MLE2001A Materials Science & Engineering Principles & Practice II [4]	4
MLE2102 Thermodynamics and Renewable Energy Technologies	4
MLE2103A Materials Kinetics & Processing	2
MLE2105 Electronic Properties of Materials	4
MLE3101A Materials Characterization	3
MLE3101 Materials Characterization Laboratory	3
MLE3103 Materials Design: Aerospace to Biomedical Applications	4
MLE3111A Materials Properties and Processing Laboratory	2
MLE3112 Machine Learning Approaches in Materials Laboratory	2
Two Technical Elective at any level (3000--5000) [2]	8
UNRESTRICTED ELECTIVES	**20**
Build Your Own Degree	
TOTAL	**122**

[1] See Table 3

[2] See Table 4

[3] See https://www.eng.nus.edu.sg/mse/undergraduate/build-your-own-degree/.

[4] - Students from other Engineering majors who transfer into MSE are allowed to map the Gateway courses taken in their previous Engineering majors to the Gateway courses in MSE (MLE1001B and MLE2001A).

- One level 1000 Gateway course can be mapped to the level 1000 MSE Gateway course (MLE1001B) and one level 2000 Gateway course can be mapped to the level 2000 MSE Gateway course (MLE2001A). Exception for Environmental Engineering which has two level 2000 Gateway courses. ESE2101 can be mapped to level 1000 MSE Gateway course (MLE1001B), ESE2102 can be mapped to the level 2000 MSE Gateway course (MLE2001A).

- Students who are not taking MLE2001A due to mapping from other level 2000 Gateway course are required to take MLE2301 Introduction to Materials, which will count as a technical elective.

Table 3: Catalogue of Courses in Common Curriculum

Common Curriculum Pillar	Basket of Courses [1]
Singapore Studies	Students may read any course from the curated list of courses as approved by the NUS General Education Committee for this pillar (GESS).
Cultures and Connections	Students may read any course from the curated list of courses as approved by the NUS General Education Committee for this pillar (GEC).
Communities and Engagement	Students may read any course from the curated list of courses as approved by the NUS General Education Committee for this pillar (GEN).
Critique and Expression	ES2631 Critique and Communication of Thinking and Design [3]
Digital Literacy	CS1010E Programming Methodology
Data Literacy	GEA1000 Quantitative Reasoning with Data [5]
Design Thinking	DTK1234 Design Thinking
Maker Space	EG1311 Design and Make/ EG1311BE Design and Make
Systems Thinking	IE2141 Systems Thinking and Dynamics [6]
Artificial Intelligence	EE2211 Introduction to Machine Learning/ EE2213 Introduction to Artificial Intelligence
Sustainable Futures	EG2501/CDE2501 Liveable Cities [4] [6]
Creating Narratives	CDE2000 Creating Narratives [6]
Project Management	PF1101 Project Management/ PF1101A Project Management and Finance
Integrated Project	Complete 8 Units from the following list of courses MLE4101B B.Eng. Dissertation MLE4102A Design Project Integrated Honours Project EG4301 DCP B.Eng. Dissertation [2]

[1] The listing of courses is expected to grow and evolve over time, to suit curricular needs

[2] EG4301 is a 12 Units course that forms part of the Innovation and Design Second Major. Students taking this will fulfil the Integrated Project pillar (8 Units) and an additional 4 Units of Unrestricted Electives.

[3] ES2631 Critique and Communication of Thinking and Design has replaced ES2531 Critical Thinking and Writing

[4] CDE2501 replaces EG2501 with effect from AY2023/2024 semester 1

[5] Students may take any course from the basket of courses approved bu the NUS General Education Committee for the Data Literacy pillar. Instead of just GEA1000

[6] Wef AY25/26 Sem 1, there are changes to the graduation requirements for cohort AY22/23 to AY24/25. *Click here for more details*

Table 4: List of Technical Elective Courses

List of Technical Elective Courses
MLE2301 Introduction to Materials Science & Engineering (not applicable to those who take MLE1001B, MLE2001A)
MLE3102 Degradation and Failure of Materials
MLE3104 Polymeric and Composite Materials
MLE3105 Dielectric and Magnetic Materials
MLE3202 Materials for Biointerfaces
MLE3203 Engineering Materials
MLE4201 Advanced Materials Characterisation
MLE4202 Selected advanced Topics on Polymers
MLE4203 Polymeric Biomedical Materials
MLE4204 Synthesis and Growth of Nanostructures
MLE4205 Theory & Modelling of Material Properties
MLE4206 Current topics on Nanomaterials
MLE4207 Microfabrication Process and Technology
MLE4208 Photovoltaic Materials
MLE4210 Materials for Energy Storage and Conversion
MLE4211 Nanoelectronics and information technology
MLE4212 Advanced Structural Materials
MLE4213 Innovation & Product Development for Material Engineers
MLE4217 Application of Big Data in Materials Science
MLE4218 AI for Biomaterials Discovery
MLE4219 Materials for Optics: from Quantum Light to Nanodevices
MLE4220 Two-Dimensional Materials
MLE4221 Emerging materials for renewable fuels and clean water
MLE4222 Electron transport in novel quantum materials
MLE4225 Electro-active Materials for Sustainability
MLE4227 Sustainable Water Harvesting Technologies
MLE4228 Robotics Materials
MLE4230 Current Topics in Materials AI
MLE4231 Optoelectronics with Organics and Nanocrystals
MLE5215 Atomistic Modelling of Molecules and Materials (open to those with level 4 standing and minimum GPA of 3.5)
MLE5223 Rational Materials Design for Sustainability

Specialization in NANOSTRUCTURED MATERIALS & NANOTECHNOLOGY (minimum 20 Units)

FYP in related area	
Select electives courses from list below	
MLE4201	Advanced Materials Characterisation
MLE4204	Synthesis and Growth of Nanostructures
MLE4205	Theory & Modelling of Material Properties
MLE4206	Current topics on Nanomaterials
MLE4207	Microfabrication Process and Technology
MLE4208	Photovoltaics Materials
MLE4210	Materials for Energy Storage and Conversion
MLE4211	Nanoelectronics and information technology
MLE4220	Two-Dimensional Materials
PC4253	Thin Film Technology
CN4223R	Microelectronic Thin Films

Specialization in ARTIFICIAL INTELLIGENCE IN MSE (minimum 20 Units)

EE2211 Introduction to Machine Learning	
Select electives courses from list below	
MLE4101B	B.Eng. Dissertation in related area (only 4 Units will count towards the specialization)
MLE4217	Application of Big Data in Materials Science
MLE4218	AI for Biomaterials Discovery
MLE4230	Current Topics in Materials AI
MLE5215	Atomistic Modelling of Molecules and Materials (open to those with level 4 standing and minimum GPA of 3.5)
MLE5223	Rational Materials Design for Sustainability

Specialization in BIOMEDICAL MATERIALS (minimum 20 Units)

Select electives courses from list below

MLE3202	Materials for Biointerfaces
MLE4203	Polymeric Biomedical Materials
MLE4201	Advanced Materials Characterisation
BN3301	Introduction to Biomaterials
BN4404	Bioelectromechanical Systems – Biomems
BN5201	Advanced Biomaterials
BN2001	Independent Study [Footnote 1]
EG2605/ CDE2605	Undergraduate Research Opportunities Programme (UROP) [Footnote1]
BN4101	B.Eng. Dissertation in related area (8 Units) or MLE4101B B.Eng. Dissertation in related area (8 Units) or MLE4101 B.Eng. Dissertation in related area (only 8 Units will count towards the specialization)

[Footnote1]
The projects involved in this course must be approved by the Head (or Deputy Head or Specialisation Coordinator) of the student's home Department to be in the area of biomedical materials in order to count towards the specialisation.

* Prerequisites of MLE courses can be waived for Non-MSE students. They are recommended to take MLE2301 Introduction to Materials Science & Engineering

Specialization in MATERIALS FOR RENEWABLE ENERGY AND SUSTAINABILITY (minimum 20 Units)

MLE2102 Thermodynamics and Renewable Energy Technologies

Select electives courses from list below

MLE3102	Degradation and Failure of Materials
MLE4208	Photovoltaic Materials
MLE4210	Materials for Energy Storage and Conversion
MLE4221	Emerging materials for renewable fuels and clean water
MLE4225	Electro-active Materials for Sustainability
MLE4227	Sustainable Water Harvesting Technologies
MLE4101B	B.Eng Dissertation in related area or an equivalent two semester research project in a related area as approved by the Head of Department, Materials Science & Engineering (only 4 Units from the project will count towards the specialization)

Specialization in ROBOTICS (minimum 20 Units)

You spend the first two years building a solid foundation in engineering. Specialisation starts from Stage 3, when you read related technical electives as shown below. In Stage 4, you select a Final Year Project (FYP) that is related to robotics.

Must complete

(1) 12 Units from basket of courses AND complete a Final Year Project (8 Units) in the area of Robotics
OR
(2) 20 Units from basket of courses

Basket of courses:

BN4203 Robotics in Rehabilitation
BN4601 Intelligent Medical Robotics
EE4308 Autonomous Robot Systems
EE4309 Robot Perception
EE4311 Fuzzy Logic and Neuro Fuzzy Systems
EE4312 Artificial Neural Networks
EE4314 Eyes from above: Guidance, Navigation and Control
EE4705 Human-Robot Interaction
EE3305/ME3243 Robotic System Design
ME4242 Soft Robotics
ME4245 Robot Mechanics and Control
ME5406* Deep Learning for Robotics
MLE4228 Robotic Materials
RB4301 Robot Learning

* Only Stage 4 students with GPA >= 3.5 are allowed to read level 5000 courses.

To guide students in choosing the elective courses in a focused manner, the elective courses are arranged in three tracks. Students are encouraged to choose their three elective courses within the same track. However, students are allowed to "mix-and-match" the electives outside these tracks.

Track 1: Smart Mechanism Design	**Track 2: Robot Intelligence**	**Track 3: Collaborative Systems**
Robot Mechanics and Control	Autonomous Robot Systems	Robot Perception
Intelligent Medical Robotics	Fuzzy/Neural Systems for Intelligent Robotics	Human-Robot Interaction
Soft Robotics	Robot Perception	Soft Robotics
Materials for Robotic Sensing and Actuation	Robot Mechanics and Control	Robotics in Rehabilitation
Artificial Neural Networks	Deep Learning for Robotics	Deep Learning for Robotics
	Materials for Robotic Sensing and Actuation	Robotic System Design
	Fuzzy Logic and Neuro Fuzzy	Materials for Robotic Sensing and Actuation

* Prerequisites of MLE courses can be waived for Non-MSE students. They are recommended to take MLE2301 Introduction to Materials Science & Engineering

Specialization in MICROELECTRONICS AND QUANTUM MATERIALS (minimum 20 Units)

MLE2105 Electronic Properties of Materials

EE2027 Electronic Circuits

Select electives courses from list below

EE3431C	Microelectronics Materials and Devices
EE4409	Modern Microelectronic Devices & Sensors
EE4435	Modern Transistors and Memory Devices
EE4437	Photonics – Principles and Application
EE4438	Solar Cells and Modules
MLE3105	Dielectric and Magnetic Materials
MLE4201	Advanced Materials Characterisation
MLE4207	Microfabrication Process and Technology OR EE4436 Fabrication Process Technology
MLE4219	Materials for Optics: from Quantum Light to Nanodevices
MLE4220	Two-Dimensional Materials
MLE4222	Electron transport in novel quantum materials
MLE4101B	B.Eng. Dissertation in related area / EE4002D in related area / EE4002R in related area or an equivalent two semester research project in a related area as approved by the Head of Department for either Materials Science & Engineering or Electrical & Computer Engineering; (only 4 Units from the project will count towards the specialisation)

* Prerequisites of MLE courses can be waived for Non-MSE students. They are recommended to take MLE2301 Introduction to Materials Science & Engineering

Table 5: Recommended Semester Schedule for A-Level Intake

If physics bridging course (PC1201) or chemistry bridging course (CM1417) is required in semester 1, push GEA1000 to semester 3.

If both bridging courses are required in semester 1, push GEA1000, CE2407A and MA1513 to semester 3.
EE2211 will be pushed to semester 5 as CE2407A and MA1513 need to be cleared before reading EE2211.

Course	Units	Course	Units
Semester 1		**Semester 2**	
MLE1001B Materials Science & Engineering Principles & Practice I	4	MLE2001A Materials Science & Engineering Principles & Practice II	4
CE2407A Uncertainty Analysis for Engineers	2	CS1010E Programming Methodology	4
DTK1234 Design Thinking	4	EG1311 Design and Make	4
GEA1000 Quantitative Reasoning with Data	4	MA1511 Engineering Calculus	2
MA1513 Linear Algebra with Differential Equations	2	MA1512 Differential Equations for Engineering	2
PF1101 Project Management/ PF1101A Project Management and Finance	4	GESS/GEC/GEN	4
Sub-total	**20**	**Sub-total**	**20**
Semester 3		**Semester 4**	
MLE2102 Thermodynamics and Renewable Energy Technologies	4	MLE2105 Electronic Properties of Materials	4
EE2211 Introduction to Machine Learning/	4	ES2631 Critique and Communication of Thinking and Design	4
EG2501/CDE2501 Liveable Cities #	4	IE2141 Systems Thinking and Dynamics #	4
EG2401A Engineering Professionalism	2	GESS/GEC/GEN	4
UE	4	UE	4
UE	4		
Sub-total	**22**	**Sub-total**	**20**
Semester 5		**Semester 6**	
MLE2103A Materials Kinetics & Processing	2	EG3611A Industrial Attachment *	10
MLE3101A Materials Characterization	3	MLE Technical Elective	4
MLE3101 Materials Characterization Laboratory	3	UE	4
GESS/GEC/GEN	4		
UE	4		
UE	4		
Sub-total	**20**	**Sub-total**	**18**
Semester 7		**Semester 8**	
MLE4101B B.Eng. Dissertation or MLE4102A Design Project (over two semesters)	4	MLE4101B B.Eng. Dissertation or MLE4102A Design Project (over two semesters)	4
MLE3103 Materials Design: Aerospace to Biomedical Applications	4	MLE3112 Machine Learning Approaches in Materials Laboratory	2
MLE3111A Materials Properties and Processing Laboratory	2	MLE Technical Elective	4
CDE2000 Creating Narratives #	4	UE	4
UE	4	UE	4
		UE	4
Sub-total	**18**	**Sub-total**	**22**
Total Units			**160**

* EG3611A
- Students are highly encouraged to complete MLE3101A Materials Characterization and MLE3101 Materials Characterization Laboratory (in semester 5 or map from SEP) before doing EG3611A Industrial Attachment in semester 6.
- Can be replaced by:

EG3612 Vacation Industrial attachment (6 Units) + either
CFG2101 NUS Vacation Internship Programme (4 Units) or
EG2605/CDE2605 Undergraduate Research Opportunity Programme (4 Units) or
CDE2605R Undergraduate Research Experience (4 Units)

Wef AY25/26 Sem 1, there are changes to the graduation requirements for cohort AY22/23 to AY24/25. *Click here for more details*

Table 6: Recommended Semester Schedule for Poly Intake

Assumes 38 Units of advanced placement credits are granted and physics bridging course (PC1201) is required.

If maths bridging course (MA1301) is required in semester 1, push CE2407A and MA1513 to semester 3.
EE2211 will be pushed to semester 5 as CE2407A and MA1513 need to be cleared before reading EE2211.

Course	Units	Course	Units
Semester 1		**Semester 2**	
MLE1001B Materials Science & Engineering Principles & Practice I	4	MLE2001A Materials Science & Engineering Principles & Practice II	4
CE2407A Uncertainty Analysis for Engineers	2	CS1010E Programming Methodology	4
PC1201 Fundamentals of physcs	4	UE	4
GEA1000 Quantitative Reasoning with Data	4	MA1511 Engineering Calculus	2
MA1513 Linear Algebra with Differential Equations	2	MA1512 Differential Equations for Engineering	2
PF1101 Project Management/ PF1101A Project Management and Finance	4	GESS/GEC/GEN	4
Sub-total	**20**	**Sub-total**	**20**
Semester 3		**Semester 4**	
MLE2102 Thermodynamics and Renewable Energy Technologies	4	MLE2105 Electronic Properties of Materials	4
EE2211 Introduction to Machine Learning	4	ES2631 Critique and Communication of Thinking and Design	4
EG2501/CDE2501 Liveable Cities #	4	IE2141 Systems Thinking and Dynamics #	4
EG2401A Engineering Professionalism	2	GESS/GEC/GEN	4
MLE3101A Materials Characterization	3	MLE Technical Elective	4
MLE3101 Materials Characterization Laboratory	3		
MLE2103A Materials Kinetics & Processing	2		
Sub-total	**22**	**Sub-total**	**20**
Semester 5		**Semester 6**	
MLE4101B B.Eng. Dissertation or MLE4102A Design Project (over two semesters)	4	MLE4101B B.Eng. Dissertation or MLE4102A Design Project (over two semesters)	4
MLE3103 Materials Design: Aerospace to Biomedical Applications	4	MLE3112 Machine Learning Approaches in Materials Laboratory	2
MLE3111A Materials Properties and Processing Laboratory	2	MLE Technical Elective	4
CDE2000 Creating Narratives #	4	UE	4
GESS/GEC/GEN	4	UE	4
		UE	4
Sub-total	**18**	**Sub-total**	**22**
Total Units			**122**

Wef AY25/26 Sem 1, there are changes to the graduation requirements for cohort AY22/23 to AY24/25. *Click here for more details*

Changes with effect from AY25/26 Sem 1 (For cohort AY2022/2023 to AY2024/2025)

With effect from AY25/26 Sem 1, CDE has introduced **additional graduation requirements** for students from **cohort AY2022/2023 to AY2024/2025**.

Students need to read **MSE technical courses** to meet graduation requirements.

The minimum number of additional technical courses you are required to read is based on your year of matriculation and your normal programme duration (NPD). The NPD for Bachelor of Materials Science and Engineering degrees is four years for most students. For local polytechnic diploma holders who were awarded advanced placement credits, the NPD is three years. In general, the new requirement represents one additional technical course per year of study remaining. The table below shows the minimum number of additional technical courses required for each group of students.

Year of Matriculation	**Normal programme duration: Four years**	**Normal programme duration: Three years**
AY2022/2023	One additional technical course	None (due to graduate)
AY2023/2024	Two additional technical courses	One additional technical course
AY2024/2025	Three additional technical courses	Two additional technical courses

Students may use the following space in the Common Curriculum to read the additional technical courses:
- Take a technical course in lieu of Systems Thinking pillar
- Take a technical course in lieu of Creating Narratives pillar
- CDE2501 to be read towards the Singapore Studies pillar if students have not read any GESS.
  To take a technical course in lieu of the Sustainable Futures pillar

If you do not have sufficient space in these three pillars you will need to use your Unrestricted Electives to read the additional technical courses.

For the following groups of students, you will <u>not be affected by the new curriculum changes:</u>

- Cohorts AY2021/22 & earlier
- Cohort AY2022/2023 who have completed your degree requirements by the end of AY2024/2025

For more information, please refer to Curriculum Structure - College of Design and Engineering

List of MSE Technical Courses

MLE2108 Structure and Mechanical Properties of Materials

Course Information:
This course provides a broad overview of the fundamental principles governing the structure and mechanical behaviour of materials. The first half explores crystallography, including symmetry, unit cells, Bravais lattices, and diffraction techniques (x-ray and neutron diffraction with a focus on powder diffraction). The second half delves into the mechanical properties, focusing on stress and strain tensors, different stress states, and defects in solids. Students will also examine dislocation movements and the forces that influence material strength. This course equips students with essential knowledge for understanding the structure-property relationships in engineering materials.

Units: 4

Grading Basis: Graded

MLE3104 Polymeric and Composite Materials

Course Information:
Classification of polymers, polymer structure, molecular weight distribution; Basic synthetic and characterisation methods; Amorphous state and glass transition, crystalline state; General properties of polymers: physical, chemical, mechanical and electrical; Engineering and specialty polymers: processing and applications; Polymer-based composite materials: fabrication, structure and properties.

Prerequisite:
If undertaking an Undergraduate Degree then (must have completed 1 of CM1121/CM1501/MLE1001/MLE1002/MLE1101/MLE1111/MLE2102/MLE2301 at a grade of at least D)

Units: 4

Grading Basis: Graded

MLE3203 Engineering Materials

Course Information:
This module focuses on engineering materials – metals and ceramics. Crystalline structure of important industrial metals and ceramics. Mineral processing and materials fabrication. Phase formation and development and microstructure optimization for engineering applications.

Prerequisite:
If undertaking an Undergraduate Degree then (must have completed 1 of MLE1001/MLE1002/MLE1111/MLE2102 at a grade of at least D)

Preclusion:
If undertaking an Undergraduate Degree then (must not have completed 1 of MLE2106/MLE2107 at a grade of at least D)

Units: 4

Grading Basis: Graded