

**Bachelor of Engineering (Materials Engineering)
Second Major in Data Analytics (AY2023-24)**

Last Update: 13-Oct-23

Academic Unit (AU) Required for graduation

| Year of Study | Core | MPE | CC | FC | BDE | Total AU |
|---------------|----------------------|-----|----|----|-----|------------------------|
| 1 | 25 / 26 ⁺ | - | 9 | - | 3 | 37 / 38 ⁺ |
| 2 | 20 | - | 8 | 3 | 10 | 41 |
| 3 | 15 | - | - | 12 | 3 | 30 |
| 4 | 15 | 11 | - | - | 6 | 32 |
| | 75 / 76 ⁺ | 11 | 17 | 15 | 22 | 140 / 141 ⁺ |

⁺ Students without H2 Level Physics will take PH1012 (4 AU)

Year 1 (AY2023-24) - Semester 1

| Course Code and Title | Course Type | AU |
|--|-------------|-----------|
| CC0003 Ethics & Civics in a Multi-Cultural World | CC | 2 |
| CC0005 Healthy Living & Wellbeing | CC | 3 |
| PH1011 Physics ^{*/**} | Core | 3 |
| MH1810 Mathematics I [*] | Core | 3 |
| MS1013 Materials Chemistry I [*] | Core | 2 |
| MS1016 Thermodynamics of Materials | Core | 3 |
| MS1017 Introduction to Materials Science | Core | 2 |
| Total | | 18 |

** Students who obtained at least 3 'A's in H2 level subjects and at least grade 'E' or 'C6' in General Paper (GP) or Knowledge Inquiry (KI) will be eligible for exemption if a grade 'A' is obtained in the corresponding subject at H2 level.*

*** Students without H2 Level Physics will take PH1012 Physics A (4 AU)*

Year 1 (AY2023-24) - Semester 2

| Course Code and Title | Course Type | AU |
|--|-------------|----|
| CC0001 Inquiry and Communication in the Interdisciplinary World | CC | 2 |
| CC0002 Navigating the Digital World | CC | 2 |
| EG1001 Engineer & Society | Core | 2 |
| MS1008 Introduction to Computational Thinking - Knowledge Area 3 | Core | 3 |
| MS1014 Materials Chemistry II | Core | 2 |

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| | | |
|--|------------|-----------|
| MS1018 Properties of Materials | Core | 2 |
| MS2013 Introduction to Polymer Science | Core | 3 |
| BDE - 2nd Major Elective | BDE | 3 |
| Total | | 19 |

Year 2 (AY2024-25) - Semester 1

| Course Code and Title | Course Type | AU |
|---|--------------------|-----------|
| CC0007 Science & Technology for Humanity | CC | 3 |
| MS2012 Introduction to Manufacturing Processes | Core | 3 |
| MS2015 Mechanical Behaviour of Materials | Core | 3 |
| MS2016 Introduction to Metallurgy | Core | 2 |
| MS2083 Laboratory on Structure-Property Relationship in Polymers | Core | 1 |
| BC 2406 Analytics I: Visual and Predictive Techniques - Knowledge Area 7 | BDE | 4 |
| BDE - 2nd Major Elective | BDE | 3 |
| Total | | 19 |

Year 2 (AY2024-25) - Semester 2

| Course Code and Title | Course Type | AU |
|---|--------------------|-----------|
| ML0004 Career and Entrepreneurial Development for the Future World | CC | 2 |
| CC0006 Sustainability: Society, Economy & Environment | CC | 3 |
| MH2811 Mathematics II - Knowledge Area 2 | Core | 3 |
| MS0003 Introduction to Data Science and Artificial Intelligence^ | FC | 3 |
| MS2014 Materials Structure and Defects | Core | 3 |
| MS2018 Electronic & Magnetic Properties of Materials | Core | 3 |
| MS2084 Phase Transformations and Kinetics in Steels | Core | 1 |
| MS3082 Design Lab | Core | 1 |
| BDE - 2nd Major Elective | BDE | 3 |
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Year 3 (AY2025-26) - Semester 1

| Course Code and Title | Course Type | AU |
|--|--------------------|-----------|
| HW0288 Effective Communication | FC | 2 |
| MS3011 Metallic & Ceramic Materials | Core | 3 |
| MS3012 Micro/Nanoelectronic Materials Processing | Core | 3 |
| MS3013 Electrochemical Corrosion | Core | 3 |
| MS3014 Analysis of Materials | Core | 3 |
| MS3015 Industrial Design | Core | 3 |
| EE/IM2007/EE2107 Engineering Mathematics^ | BDE | 3 |
| Total | | 20 |

^pre-requisite for EE4483 Artificial Intelligence & Data Mining (3AU)

Year 3 (AY2025-26) - Semester 2

| Course Code and Title | Course Type | AU |
|-----------------------------------|--------------------|-----------|
| ***MS3099 Professional Internship | FC | 10 |
| Total | | 10 |

***The school will assign students for Professional Internship in Year 3, either Semester 1 or 2.

Year 4 (AY2026-27) - Semester 1

| Course Code and Title | Course Type | AU |
|---|--------------------|-----------|
| MS4089 Final Year Project | Core | 4 |
| MS4012 Quality Control - Knowledge Area 1 | Core | 3 |
| MS4013 Biomaterials | Core | 2 |
| EE4483 Artificial Intelligence & Data Mining - Knowledge Area 6 | BDE | 3 |
| MPE1 | MPE | 3 |
| MPE2 | MPE | 3 |
| Total | | 18 |

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Year 4 (AY2026-27) - Semester 2

| Course Code and Title | Course Type | AU |
|---|--------------------------------|------------|
| MS4089 Final Year Project | Core | 4 |
| MS4014 Nanomaterials: Fundamentals and Applications | Core | 2 |
| MS4671 Introduction to Materials Simulation - Knowledge Area 4 | MPE | 3 |
| EE4791 Database Systems (3AU) - Knowledge Area 5 | BDE | 3 |
| ^MPE3 | MPE | 2 |
| Total | | 14 |
| | Total AU for Graduation | 140 |

^Students can take 3 AU MPE to clear this requirement

Recommended electives (no pre-req):

| Course Code | Course Title | AUs |
|-------------|--|-----|
| MA4829 | Machine Intelligence | 3 |
| MA4830 | Real Time Software for Mechatronics System | 3 |
| MA4832 | Microprocessor System | 3 |

[The complete list of elective available on COE Website: Second Major in Data Analytics](#)