

B.Eng (Hons) in Chemical and Biomolecular Engineering with 2nd Major in Data Analytics

with Professional Internship

AY2025 - 2026 Intake onwards (CBDA)

| Programme | Year of Study | Number of Academic Units (AU) | | | | | | |
|---|---------------|-------------------------------|----------------|--------------------------------------|--------------------------|--------------------------|--|---------------|
| | | Major Requirement | | Interdisciplinary Collaborative Core | | | Broadening and Deepening Electives (BDE) | Total |
| | | Core (C) | Major PE (MPE) | Common Core (CC) | Professional Series (PS) | Care, Serve, Learn (CSL) | | |
| Chemical & Biomolecular Engineering with Second Major in Data Analytics | 1 | 24/25* [4] | | 6 | | | | 30/31* [4] |
| | 2 | 28 [6] | | 8 | 3 | | | 39 [6] |
| | 3 | 17 | | | 13 | | | 30 |
| | 4 | 8 | 6 | | | 3 | 22 | 39 |
| | Total | 77/78* [10] | 6 | 14 | 16 | 3 | 22 | 138/139* [10] |

| Category | | AU | Total AU |
|--|---|----|----------|
| Interdisciplinary Collaborative Core (ICC) | Common Core (CC) | | |
| | CC0001 Inquiry and Communication in the Interdisciplinary World | 2 | 14 |
| | CC0003 Ethics & Civics in a Multi-Cultural World | 2 | |
| | CC0006 Sustainability: Society, Economy & Environment | 3 | |
| | CC0007 Science & Technology for Humanity | 3 | |
| | CC0015 Health & Wellbeing | 2 | |
| | ML0004 Career Design & Workplace Readiness in the V.U.C.A World | 2 | |
| Interdisciplinary Collaborative Core (ICC) | Professional Series (PS) | | |
| | CB0494 Introduction to Data Science and Artificial Intelligence | 3 | 16 |
| | HW0288 Engineering Communication | 2 | |
| | MLXXXX Professional Preparation | 1 | |
| | CH3920 Professional Internship | 10 | |
| Major Requirement | Care, Service, Learn (CSL) | | |
| | Service Learning | 3 | 3 |
| Major Requirement | CBE Core | | |
| | EG1001 Engineers In Society | 2 | 12 |
| | MH1810 Math 1 | 3 | |
| | PH1011* Physics | 3 | |
| | CB1102 Introduction to Chemical and Biomedical Engineering | 1 | |
| | CB1103 Organic Chemistry For Engineers | 3 | |

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|------------------------------------|--|---|----|----|
| Major Requirement | CB1117^ | Engineering Mathematics | 4 | 65 |
| | CB1131 | Introduction to Biomolecular Engineering | 3 | |
| | CH1104 | Materials & Energy Balance | 3 | |
| | CH1801 | Chemical & Biomolecular Engineering Laboratory 1A | 1 | |
| | CH1802 | Chemical & Biomolecular Engineering Laboratory 2 | 1 | |
| | CH2010^ | Engineering Statistics | 3 | |
| | CH2103 | Fluid Systems | 3 | |
| | CH2107^ | Introduction to Computational Thinking | 3 | |
| | CH2108 | Thermodynamics | 3 | |
| | CH2112 | Chemical Reaction Engineering | 3 | |
| | CH2114 | Heat & Mass Transfer in Chemical and Biological Systems | 3 | |
| | CH2123 | Chemical Thermodynamics | 3 | |
| | CH2151 | Unit Operations: Fluid-Solid Separation | 3 | |
| | CH2801 | Chemical & Biomolecular Engineering Laboratory 2A | 2 | |
| | CH2802 | Chemical & Biomolecular Engineering Laboratory 2B | 2 | |
| | CH3104 | Biochemical Engineering | 3 | |
| | CH3109 | Decision Tools for Business & Engineering | 3 | |
| | CH3111 | Process Control and Dynamics | 3 | |
| | CH3121 | Chemical, Biological & Plant Safety | 2 | |
| | CH3140 | Unit Operations: Fluid-Fluid Separation | 3 | |
| | CH3802 | Chemical & Biomolecular Engineering Laboratory 5 | 3 | |
| | CH4801 | Final Year Design Project | 8 | |
| | CBE Major Prescribed Electives (MPE) | | | |
| | CBE PE 1 | | | 3 |
| | CBE PE 2 | | | 3 |
| | | | | |
| 2nd Major in Data Analytics (BDEs) | Data Analytics Compulsory Courses | | | 13 |
| | 1) Linear Algebra: CB1117 Engineering Mathematics | | NA | |
| | 2) Computing Skills: BG2211 Introduction to Computational Thinking | | NA | |
| | 3) Probability and Statistics: CH2010 Engineering Statistics | | NA | |
| | 4) Algorithms: MH1403 Algorithms & Computing | | 3 | |
| | 5) Database: EE4791 Database Systems (3AU) | | 3 | |
| | 6) Data Mining: EE4483 Artificial Intelligence & Data Mining | | 3 | |
| | 7) Data Visualisation/Management: BC2406 Analytics I: Visual and Predictive Techniques | | 4 | |

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|--|---|---|-------------|
| 2nd Major in Data Analytics (BDEs) | Electives | | |
| | CH4244 Numerical Method and Data Analytics | 3 | |
| | CB4246 Optimisation Using Artificial Intelligence | 3 | |
| | CB4247 Statistics & Computational Inference to Big | 3 | |
| | <i>Other Available Electives:</i> | | |
| | EE4414 Machine Learning Design & Application (3AU) | | 9 |
| | EE4497 Pattern Recognition & Machine Learning (3AU) | | |
| | MA4830 Real Time Software for Mechatronics System | | |
| | MA4832 Microprocessor System (3AU) | | |
| | MS4671 Introduction to Materials Simulation (3AU) | | |
| | | | |
| Total | | | 138 |
| | | | 139* |

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

^Counted towards 2nd Major in Data Analytics requirement (total 10AU)

[] AU of courses that could be used to fulfil Core/MPE requirement and 2nd Major requirement concurrently

B.Eng. (Chemical & Biomolecular Engineering) with 2nd Major in Data Analytics (DA)

Suggested Study Plan for AY2025-2026 intake (CBDA)

with Professional Internship**Year 1 Semester 1**

| Course | Type | AU |
|---|------|----|
| CB1102 Introduction to Chemical and Biomedical Engineering | C | 1 |
| CB1131 Introduction to Biomolecular Engineering | C | 3 |
| CH1801 Chemical & Biomolecular Engineering Laboratory 1A | C | 1 |
| MH1810 Math 1 | C | 3 |
| PH1011 Physics | C | 3 |
| PH1012 Physics A (* For students without 'A' Level Physics) | C | 4 |
| CC0001 Inquiry and Communication in the Interdisciplinary World | CC | 2 |

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13 14

Year 2 Semester 1

| Course | Type | AU |
|---|------|----|
| CH2103 Fluid Systems | C | 3 |
| [^] CH2107 Introduction to Computational Thinking | C | 3 |
| CH2108 Thermodynamics | C | 3 |
| [^] CH2010 Engineering Statistics | C | 3 |
| CH2801 Chemical & Biomolecular Engineering Laboratory 2A | C | 2 |
| ML0004 Career Design & Workplace Readiness in the V.U.C.A World | CC | 2 |
| CC0006 Sustainability: Society, Economy & Environment | CC | 3 |

19

Year 3 Semester 1

| Course | Type | AU |
|---|------|----|
| CH3104 Biochemical Engineering | C | 3 |
| CH3109 Decision Tools for Business & Engineering | C | 3 |
| CH3111 Process Control and Dynamics | C | 3 |
| CH3121 Chemical, Biological & Plant Safety | C | 2 |
| CH3140 Unit Operations: Fluid-Fluid Separation | C | 3 |
| CH3802 Chemical & Biomolecular Engineering Laboratory 5 | C | 3 |
| HW0288 Engineering Communication | PS | 2 |
| MLXXXX Professional Preparation | PS | 1 |

20

Year 4 Semester 1

| Course | Type | AU |
|--|------|----|
| CH4801 Final Year Design Project | C | 4 |
| CBE PE 1 | MPE | 3 |
| Service Learning | CSL | 3 |
| IE4483 Artificial Intelligence & Data Mining | BDE | 3 |
| BC2406 Analytics I: Visual and Predictive Techniques | BDE | 4 |
| CH4244 Numerical Method and Data Analytics | BDE | 3 |

20

Year 1 Semester 2

| Course | Type | AU |
|---|------|----|
| CB1103 Organic Chemistry For Engineers | C | 3 |
| [^] CB1117 Engineering Mathematics | C | 4 |
| CH1104 Materials & Energy Balance | C | 3 |
| CH1802 Chemical & Biomolecular Engineering Laboratory 2 | C | 1 |
| EG1001 Engineers in Society | C | 2 |
| CC0003 Ethics & Civics in a Multi-Cultural World | CC | 2 |
| CC0015 Health & Wellbeing | CC | 2 |

17

Year 2 Semester 2

| Course | Type | AU |
|---|------|----|
| CH2112 Chemical Reaction Engineering | C | 3 |
| CH2114 Heat & Mass Transfer in Chemical and Biological Systems | C | 3 |
| CH2123 Chemical Thermodynamics | C | 3 |
| CH2151 Unit Operations: Fluid-Solid Separation | C | 3 |
| CH2802 Chemical & Biomolecular Engineering Laboratory 2B | C | 2 |
| CC0007 Science & Technology for Humanity | CC | 3 |
| CB0494 Introduction to Data Science and Artificial Intelligence | PS | 3 |

20

Year 3 Semester 2

| Course | Type | AU |
|--------------------------------|------|----|
| CH3920 Professional Internship | PS | 10 |

10

Year 4 Semester 2

| Course | Type | AU |
|---|------|----|
| CH4801 Final Year Design Project | C | 4 |
| CBE PE 2 | MPE | 3 |
| MH1403 Algorithms & Computing | BDE | 3 |
| EE4791 Database Systems | BDE | 3 |
| CB4246 Optimisation Using Artificial Intelligence | BDE | 3 |
| CB4247 Statistics & Computational Inference to Big Data | BDE | 3 |

19

Total (AU)**138****139***

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

[^]Counted towards 2nd Major in Data Analytics requirement (total 10AU)