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

with Professional Internship

AY2024 - 2025 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)	Foundational Core (FC)		
Chemical & Biomolecular Engineering with Second Major in Data Analytics	1	24/25* [4]		9			33/34* [4]
	2	28 [6]		8	3		39 [6]
	3	17			12		29
	4	8	6			22	36
	Total	77/78* [10]	6	17	15	22	137/138* [10]

Category			AU	Total AU
Interdisciplinary Collaborative Core (ICC)	**Common Core (University-level)**			17
	CC0001	Inquiry and Communication in the Interdisciplinary World	2	
	CC0002	Navigating the Digital World	2	
	CC0003	Ethics & Civics in a Multi-Cultural World	2	
	CC0005	Healthy Living & Wellbeing	3	
	CC0006	Sustainability: Society, Economy & Environment	3	
	CC0007	Science & Technology for Humanity	3	
	ML0004	Career and Entrepreneurial Development for the Future World	2	
	Foundational Core (College-level)			15
	HW0288	Engineering Communication	2	
	CB0494	Introduction to Data Science and Artificial Intelligence	3	
	CH3920	Professional Internship	10	
Major Requirement	**CBE Core**			12
	EG1001	Engineers In Society	2	
	MH1810	Math 1	3	
	PH1011*	Physics	3	
	CB1102	Introduction to Chemical and Biomedical Engineering	1	
	CB1103	Organic Chemistry For Engineers	3	

Major Requirement	CB1117^	Engineering Mathematics	4	65
	CB1131	Introduction to Biomolecular Engineering	3	
	CH1104	Materials & Energy Balance	3	
	CH1801	Chemical & Biomolecular Engineering	1	
	CH1802	Chemical & Biomolecular Engineering	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 Seperation	3	
	CH2801	Chemical & Biomolecular Engineering	2	
	CH2802	Chemical & Biomolecular Engineering	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	3	
	CH4801	Final Year Design Project	8	
	CBE Major Prescribed Electives (MPE)			
	CBE PE 1		3	6
	CBE PE 2		3	
2nd Major in Data Analytics (BDEs)	**Data Analytics Compulsory Courses**			22
	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	
	Electives			
	CH4244	Numerical Method and Data Analytics	3	
	CB4246	Optimisation Using Artificial Intelligence	3	
	Choose 1 from the following:			
	EE4414 Machine Learning Design & Application (3AU)			
	EE4497 Pattern Recognition & Machine Learning (3AU)			

	MA4829 Machine Intelligence (3AU) MA4830 Real Time Software for Mechatronics System (3AU) MA4832 Microprocessor System (3AU) MS4671 Introduction to Materials Simulation (3AU)	3	
Total			**137/138***

**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 requirment and 2nd Major requirment concurrently

B.Eng. (Chemical & Biomolecular Engineering) with 2nd Major in Data Analytics (DA)
Suggested Study Plan for AY2024-2025 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
	or		
PH1012	Physics A *(* For students without 'A' Level Physics)*	C	4
CC0001	Inquiry and Communication in the Interdisciplinary World	CC	2
CC0002	Navigating the Digital World	CC	2
			15

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
CC0005	Healthy Living & Wellbeing	CC	3
			18

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
CC0006	Sustainability: Society, Economy & Environment	CC	3
ML0004	Career and Entrepreneurial Development for the Future World	CC	2
			19

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 A	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	FC	3
			20

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	FC	2
			19

Year 3 Semester 2

Course		Type	AU
CH3920	Professional Internship	FC	10
			10

Year 4 Semester 1

Course		Type	AU
CH4801	Final Year Design Project	C	4
	CBE PE 1	MPE	3
EE4483	Artificial Intelligence & Data Mining	BDE	3
BC2406	Analytics I: Visual and Predictive Techniques	BDE	4
CH4244	Numerical Method and Data Analytics	BDE	3
	DA Elective 2	BDE	3
			20

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
			16

Total (AU) **137**
138*

**Students without 'A' Level Physics will take 'PH1012 Physics A' (4AU).*
^Counted towards 2nd Major in Data Analytics requirement (total 10AU)