

Double Major in Process Engineering and Synthetic Chemistry
B.Eng.Sc (Hons) in Process Engineering and Synthetic Chemistry (PESC)
 AY2025 - 2026 Intake onwards
with FYDP/FYP Option

Programme	Year of Study	Number of Academic Units (AU)						
		Major Requirement		Interdisciplinary Collaborative Core			Broadening and Deepening Electives (BDE)	Total
Process Engineering and Synthetic Chemistry	1	25/26*		6	3		3	37/38*
	2	30		8				38
	3	20			11			31
	4	8/10^	18		2	3	5/3^	36
	Total	83/84*^ or 85/86*^	18	14	16	3	8/6^	142/143*

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	
	Professional Series (PS)			
	PS0002	Introduction to Data Science and Artificial Intelligence	3	16
	HW0288	Engineering Communication	2	
	MLXXXX	Professional Preparation	1	
	CH3920	Professional Internship	10	
	Care, Service, Learn (CSL)			
		Service Learning	3	3
Major Requirement	Common			
	CB1102	Intro to Chemistry, Chem Eng & Biomed Eng	1	8
	PH1011*	Physics / Physics A	3	
	CY1101	Molecules	4	

Major Requirement	CBE Core		
	CB1117 Engineering Mathematics	4	
	CH1104 Materials & Energy Balance	3	
	CH2103 Fluid Systems	3	
	CH2010 Engineering Statistics	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	
	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	67
	CHEM Core		
	MH1802 Calculus for the Sciences	4	
	PS0001 Introduction to Computational Thinking	3	
	CM2021 Inorganic and Bioinorganic Chemistry	3	
	CM2011 Analytical Chemistry	3	
	CM2031 Organic and Bioorganic Chemistry	3	
	CM2061 Chemistry and Biological Chemistry Laboratory 1	3	
	CM3011 Chemical Spectroscopy and Applications	3	
	CM3031 Organic Reaction Mechanisms and Synthesis	3	
	CM3061 Chemistry and Biological Chemistry	3	
	CM3021 Organometallic Chemistry	3	
	CH4801 Final Year Design Project (FYDP)^ or CM4080 Final Year Project (FYP)		8/10^
	Major Prescribed Electives (MPE)		
	3 x CBE MPEs	9	18
	3 x CHEM MPEs	9	
Broadening and Deepening Electives (BDE)			8/6^
Total			142/143*

* Students read PH1011 Physics (3AU) if they have H2 physics, otherwise they will read PH1012 Physics A (4AU)

^Students reading CH4801 FYDP (8AUs) to take 3 BDEs (total 8AU), students reading CM4080 FYP (10AU) to take 2 BDEs (total 6AU)

B.Eng.Sc (Hons) in Process Engineering and Synthetic Chemistry (PESC)**Suggested Study Plan for AY2025-2026 intake***with FYDP Option***Year 1 Semester 1**

Course		Type	AU
PH1011 / PH1012*	Physics / Physics A	C	3/4*
CY1101	Molecules	C	4
MH1802	Calculus for the Sciences	C	4
PS0001	Introduction to Computational Thinking	C	3
CB1102	Intro to Chemistry, Chem Eng & Biomed Eng	C	1
CC0001	Inquiry and Communication in an interdisciplinary World	CC	2
			*
			17

Year 1 Semester 2

Course		Type	AU
CB1117	Engineering Mathematics	C	4
CH1104	Materials & Energy Balance	C	3
CM2031	Organic and Bioorganic Chemistry	C	3
CC0003	Ethics and Civics in a Multi-Cultural World	CC	2
CC0015	Health & Wellbeing	CC	2
PS0002	Introduction to Data Science and Artificial Intelligence	PS	3
BDE 1		BDE	3
			20

For students who fail QET and not exempted from English Proficiency

Year 2 Semester 1

Course		Type	AU
CH2103	Fluid Systems	C	3
CH2010	Engineering Statistics	C	3
CM2011	Analytical Chemistry	C	3
CM2021	Inorganic and Bioinorganic Chemistry	C	3
CM2061	Chem and Biochem Laboratory 1 (Synthetic Lab 1)	C	3
ML0004	Career Design & Workplace Readiness in the V.U.C.A World	CC	2
CC0006	Sustainability: Society, Economy & Environment	CC	3
			20

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
CM3061	Chemistry and Biological Chemistry Laboratory 3 (Synthetic Lab 3)	C	3
CC0007	Science & Technology for Humanity	CC	3
			18

Year 3 Semester 1

Course		Type	AU
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
CM3011	Chemical Spectroscopy and Applications	C	3
CM3021	Organometallic Chemistry	C	3
CM3031	Organic Reaction Mechanisms and Synthesis	C	3
MLXXXX	Professional Preparation	PS	1
			21

Year 3 Semester 2

Course		Type	AU
CH3920	Professional Internship	PS	10
			10

Year 4 Semester 1

Course		Type	AU
CH4801^	Final Year Design Project	C	4
	CBE MPE1	MPE	3
	CHEM MPE1	MPE	3
HW0288	Engineering Communications	PS	2
	Service Learning	CSL	3
	BDE 2	BDE	3
			18

Year 4 Semester 2

Course		Type	AU
CH4801	Final Year Design Project	C	4
	CBE MPE2	MPE	3
	CBE MPE3	MPE	3
	CHEM MPE2	MPE	3
	CHEM MPE3	MPE	3
	BDE 3^	BDE	2
			18

Total (AU)**142****143***

* Students read PH1011 Physics (3AU) if they have H2 physics, otherwise they will read PH1012 Physics A (4AU).

^ Students reading FYDP to take 3 BDEs (8AU), students reading FYP to take 2 BDEs (6AU).

B.Eng.Sc (Hons) in Process Engineering and Synthetic Chemistry (PESC)**Suggested Study Plan for AY2025-2026 intake***with FYP Option***Year 1 Semester 1**

Course		Type	AU
PH1011 / PH1012*	Physics / Physics A	C	3/4*
CY1101	Molecules	C	4
MH1802	Calculus for the Sciences	C	4
PS0001	Introduction to Computational Thinking	C	3
CB1102	Intro to Chemistry, Chem Eng & Biomed Eng	C	1
CC0001	Inquiry and Communication in an interdisciplinary World	CC	2
			*
			17

Year 1 Semester 2

Course		Type	AU
CB1117	Engineering Mathematics	C	4
CH1104	Materials & Energy Balance	C	3
CM2031	Organic and Bioorganic Chemistry	C	3
CC0003	Ethics and Civics in a Multi-Cultural World	CC	2
CC0015	Health & Wellbeing	CC	2
PS0002	Introduction to Data Science and Artificial Intelligence	PS	3
	BDE 1	BDE	3
			20

Year 2 Semester 1

Course		Type	AU
CH2103	Fluid Systems	C	3
CH2010	Engineering Statistics	C	3
CM2011	Analytical Chemistry	C	3
CM2021	Inorganic and Bioinorganic Chemistry	C	3
CM2061	Chem and Biochem Laboratory 1 (Synthetic Lab 1)	C	3
ML0004	Career Design & Workplace Readiness in the V.U.C.A World	CC	2
CC0006	Sustainability: Society, Economy & Environment	CC	3
			20

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
CM3061	Chemistry and Biological Chemistry Laboratory 3 (Synthetic Lab 3)	C	3
CC0007	Science & Technology for Humanity	CC	3
			18

Year 3 Semester 1

Course		Type	AU
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
CM3011	Chemical Spectroscopy and Applications	C	3
CM3021	Organometallic Chemistry	C	3
CM3031	Organic Reaction Mechanisms and Synthesis	C	3
MLXXXX	Professional Preparation	PS	1
			21

Year 3 Semester 2

Course		Type	AU
CH3920	Professional Internship	PS	10
			10

Year 4 Semester 1

Course		Type	AU
CM4080^	Final Year Project (Honours Project 1) (Research)	C	10
	CHEM MPE1	MPE	3
	CBE MPE1	MPE	3
HW0288	Engineering Communications	PS	2
	Service Course	CSL	3
			21

Year 4 Semester 2

Course		Type	AU
	CBE MPE 2	MPE	3
	CBE MPE 3	MPE	3
	CHEM MPE 2	MPE	3
	CHEM MPE 3	MPE	3
	BDE 2^	BDE	3
			15

Total (AU)**142****143***

* Students read PH1011 Physics (3AU) if they have H2 physics, otherwise they will read PH1012 Physics A (4AU).

^ Students reading FYDP to take 3 BDEs (8AU), students reading FYP to take 2 BDEs (6AU).