

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

Programme	Year of Study	Number of Academic Units (AU)					Total
		Major Requirement		Interdisciplinary Collaborative Core		Broadening and Deepening Electives (BDE)	
		CHEM/CBE Core (C)	Major PE (MPE)	Common Core (CC)	Foundational Core (FC)		
Process Engineering and Synthetic Chemistry	1	24/25 [#]		9	3	3	39/40 [#]
	2	33		8	2		43
	3	17			10	3	30
	4	10/8 [^]	18			2/4 [^]	30
	Total	84/83 ^{#^}	18	17	15	8/10 [^]	142/143 [#]

Double Major BESC in Process Engineering and Synthetic Chemistry (PESC)

Category		AU	Total AU
Interdisciplinary Collaborative Core (ICC)	Common Core (University-level)		
	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)		
	PS0002	Introduction to Data Science and Artificial Intelligence	3
	HW0288	Engineering Communication	2
	CH3920	Professional Internship	10

Major Requirement	Common		
	PH1011 / PH1012 [#]	Physics / Physics A	3/4 [#]
	CY1101	Molecules	4
	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	

Major Requirement	CM2061	Chemistry and Biological Chemistry Laboratory 1	3	74/75#	
	CM3011	Chemical Spectroscopy and Applications	3		
	CM3031	Organic Reaction Mechanisms and Synthesis	3		
	CM3061	Chemistry and Biological Chemistry Laboratory 3	3		
	CM3021	Organometallic Chemistry	3		
	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	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		
	CM4080 Final Year Project (FYP) or CH4801 Final Year Design Project (FYDP)^			10/8^	
	Major Prescribed Electives (MPE)				
3 x CHEM MPEs		9	18		
3 x CBE MPEs		9			
Broadening and Deepening Electives (BDE)			8/10^		
Total			142/143#		

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

^ Students reading FYP to take 2-3 BDEs (8AU), students reading FYDP to take 3-4 BDEs (10AU)

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	MCC 3/4 [#]
CY1101	Molecules	MCC 4
MH1802	Calculus for the Sciences	C 4
PS0001	Introduction to Computational Thinking	C 3
CC0001	Inquiry and Communication in an interdisciplinary World	ICC 2
CC0002	Navigating the Digital World	ICC 2
CC0005	Healthy Living and Wellbeing	ICC 3
HW0001*	English Proficiency	0

21/22[#]

* 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
CM3031	Organic Reaction Mechanisms and Synthesis	C 3
ML0004	Career & Innovative Enterprise for the Future World	ICC 2
CC0006	Sustainability: Society, Economy & Environment	ICC 3

23**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
	BDE 2	BDE 3

20**Year 4 Semester 1**

Course	Type	AU
CH4801	Final Year Design Project	C 4
	CHEM MPE1	MPE 3
	CBE MPE1	MPE 3
	BDE 3	BDE 2
	BDE 4 [^]	BDE 2

14**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	ICC 2
PS0002	Introduction to Data Science and Artificial Intelligence	FC 3
	BDE 1	BDE 3

18**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
HW0288	Engineering Communications	FC 2
CC0007	Science & Technology for Humanity	ICC 3

20**Year 3 Semester 2**

Course	Type	AU
CH3920	Professional Internship	FC 10

10**Year 4 Semester 2**

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

16**Total (AU)****142/143[#]**[#] Students read PH1011 Physics (3AU) if they have H2 physics, otherwise they will read PH1012 Physics A (4AU)[^] Students reading FYP to take 3 BDEs (8AU), students reading FYDP to take 4 BDEs (10AU)

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	MCC 3/4 [#]
CY1101	Molecules	MCC 4
MH1802	Calculus for the Sciences	C 4
PS0001	Introduction to Computational Thinking	C 3
CC0001	Inquiry and Communication in an interdisciplinary World	ICC 2
CC0002	Navigating the Digital World	ICC 2
CC0005	Healthy Living and Wellbeing	ICC 3
HW0001*	English Proficiency	0

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	ICC 2
PS0002	Introduction to Data Science and Artificial Intelligence	FC 3
BDE 1		BDE 3

21/22[#]**18**** 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
CM3031	Organic Reaction Mechanisms and Synthesis	C 3
ML0004	Career & Innovative Enterprise for the Future World	ICC 2
CC0006	Sustainability: Society, Economy & Environment	ICC 3

23**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
HW0288	Engineering Communications	FC 2
CC0007	Science & Technology for Humanity	ICC 3

20**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
BDE 2		BDE 3

20**Year 3 Semester 2**

Course	Type	AU
CH3920	Professional Internship	FC 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
BDE 3		BDE 2

18**Year 4 Semester 2**

Course	Type	AU
CBE MPE2		MPE 3
CHEM MPE2		MPE 3
CBE MPE3		MPE 3
CHEM MPE3		MPE 3

12**Total (AU)****142/143[#]**[#] Students read PH1011 Physics (3AU) if they have H2 physics, otherwise they will read PH1012 Physics A (4AU)[^] Students reading FYP to take 3 BDEs (8AU), students reading FYDP to take 4 BDEs (10AU)