2015-2016 Course Sequence

BSc with Specialization in Biochemistry

BASc in Chemical Engineering

(Biotechnology Integrated Program)

1st YEAR (30 credits)		Session	Prerequisite(s)
BIO1130	Introduction to Organismal Biology	Fall	
CHM1311	Principles of Chemistry	Fall	4U chemistry or OAC Chemistry or equivalent
MAT1320	Calculus I	Fall	One of MAT1339, Ontario 4U Calculus and Vectors MCV4U) or an equivalent
MAT1341	Introduction to Linear Algebra	Fall	MAT1339 or Ontario 4U Calculus and Vectors (MCV4U), or an equivalent
PHY1121	Fundamentals of Physics I	Fall	OAC or 4U Physics. Corequisite: MAT1320 (preferred) or MAT1330
BIO1140	Introduction to Cell Biology	Winter	4U Biology or BIO1109
CHG1125	Chemical Engineering Fundamentals	Winter	CHM1301 or CHM1311
CHM1321	Organic Chemistry I	Winter	CHM1301 or CHM1311 or 4U chemistry or OAC Chemistry or equivalent
MAT1322	Calculus II	Winter	MAT1320
PHY1122	Fundamentals of Physics II	Winter	OAC or 4U Physics; corequisite: MAT1320 (preferred) or MAT1330

2nd YEAR (36 credits)		Session	Prerequisite(s)
CHM2120	Organic Chemistry II	Fall	CHM1321
CHM2123	Laboratory of Organic Chemistry II	Fall	Corequisite: CHM2120
ENG1112	Technical Report Writing	Fall	
GNG1106	Fundamentals of Engineering Computation	Fall	
MAT2322	Calculus III for Engineers	Fall	(MAT1322 or MAT1325 or MAT1332), (MAT1341 or CEGEP linear algebra)
Complementary elective		Fall	
BCH2333	Introduction to Biochemistry	Winter	CHM2120
BIO2133	Genetics	Winter	BIO1140
CHM2330	Physical Chemistry: Introduction to the Molecular Properties of Matter	Winter	(CHM1301 or CHM1311), (MAT1322 or MAT1332), (PHY1121 or PHY1321 or PHY1122 or PHY1331)
CHM2354	Analytical Chemistry	Winter	CHM1301 or CHM1311
MAT2377	Probability and Statistics for Engineers	Winter	MAT1320 or MAT1330; corequisite: MAT1322 or MAT1325 or MAT1332
MAT2384	Ordinary Differential Equations and Numerical Methods	Winter	MAT1341, (MAT1322 or MAT1325 or MAT1322)

3rd YEAR (36 credits)		Session	Prerequisite(s)
BCH3170	Molecular Biology	Fall	BCH2333, BIO2133
BCH3356	Molecular Biology Laboratory	Fall	BCH2333; Corequisite: BCH3170 or BIO3170
BIO3124	General Microbiology	Fall	BIO1140
CHG2312	Fluid Flow	Fall	CHG1125
CHG2317	Introduction to Chemical Process Analysis and Design	Fall	CHG1125
BIO3153	Cell Biology	Fall	BIO1140
PHI2394 or HIS2129	Scientific Thought and Social Values / Technology, Society and Environment Environment since 1800	Fall / Winter	
BCH3120	General Intermediary Metabolism	Winter	BCH2333
BCH3125	Protein Structure and Function	Winter	BCH2333
BCH3346	Biochemistry Laboratory II	Winter	BCH2333
CHG2314	Heat Transfer Operations	Winter	CHG2312, CHG2317, MAT2384, ENG1112
ECO1192	Engineering Economics	Winter	

4th YEAR (51 credits)		**Session**	**Prerequisite(s)**
BCH4040*	Honours Research – Biochemistry	Fall	The student must have completed all compulsory 1000, 2000 and 3000 level courses in the Baccalaureate Honours with Specialization program with a CGPA of 6.5 or greater or with a GPA of 6,5 or greater calculated from the two most recent years of full-time study in the Specialization program (minimum of 54 credits including all compulsory all compulsory 3000 level courses).
BCH4172	Topics in Biotechnology	Fall	BCH3170 or BIO3170
BCH4932*	Biochemistry Seminar	Fall	The student must have completed all compulsory 1000, 2000 and 3000 level courses in the Baccalaureate Honours with Specialization program.
CHG3316	Transport Phenomena	Fall	CHG2312, CHG2314, CHG2317, MAT2322, MAT2384
CHG3324	Fundamentals and Applications of Chemical Engineering Thermodynamics	Fall	CHG2317
CHG3331	Application of Mathematical Methods to Chemical Engineering	Fall	CHG2312, CHG2314, CHG2317, MAT2322, MAT2384, GNG1106
CHG3335	Process control	Fall	CHG2312, CHG2314, CHG2317, MAT2384. Prerequisite or corequisite: CHG3331
BCH4040*	Honours Research – Biochemistry	Winter	The student must have completed all compulsory 1000, 2000 and 3000 level courses in the Baccalaureate Honours with Specialization program with a CGPA of 6.5 or greater or with a GPA of 6,5 or greater calculated from the two most recent years of full-time study in the Specialization program (minimum of 54 credits including all compulsory all compulsory 3000 level courses).
BCH4932*	Biochemistry Seminar	Winter	The student must have completed all compulsory 1000, 2000 and 3000 level courses in the Baccalaureate Honours with Specialization program.
Complementary elective		Winter	
Two courses from :			
BPS3101	Genomics	Winter	BIO2133
or			
BCH4101	Human Genome Structure and Function	Winter	BCH3170 or BIO3170
and			
BCH4122	Structural Biology of Proteins	Winter	BCH3125
or			
BCH4123	Pathological Chemistry	Winter	BCH3120
or			
BCH4125	Cellular Regulation and Control	Winter	BCH3120 or BIO3153
or			
BCH4188	Nucleic Acids – Structure and Functions	Winter	BCH3125, (BCH3170 or BIO3170)
or			
BCH4300	Selected Topics in Biochemistry	Winter	BCH3125, (BCH3170 or BIO3170)
CHG3111	Unit Operations	Summer	CHG3316
CHG3122	Chemical Engineering Practice	Summer	CHG2312, CHG2314, CHG3324
CHG3127	Chemical Reaction Engineering	Summer	CHG3316, CHG3331
CHG3112	Process Synthesis, Design and Economics	Summer	CHG3316, CHG3324, ECO1192. Prerequisite or corequisite: CHG3111
CHG3326	Principles of Phase Equilibria and Chemical Reaction Equilibria	Summer	CHG3316, CHG3324

*This course runs from September to April.

5th YEAR (36 credits)		**Session**	**Prerequisite(s)**
CHG3337	Data Collection and Interpretation	Fall	MAT2377
CHG4116	Chemical Engineering Laboratory	Fall	CHG3122, CHG3111, CHG3127, CHG3326, CHG3335. Prerequisite or corequisite: CHG3337
CHG4305	Advanced Materials in Chemical Engineering	Fall	81 university credits
CHG4343	Computer-Aided Design in Chemical Engineering	Fall	81 university credits including CHG3111, CHG3127, CHG3331, CHG3335
CHG4381	Biochemical Engineering	Fall	81 university credits including CHG3111, CHG3127
Technical elective		Fall	
CHG4244	Plant design Project	Winter	81 university credits including CHG3111, CHG3112, CHG3122, CHG3127, CHG3316, CHG3324, CHG3326, CHG3331, CHG3335, CHG3337
CHG4307	Clean Processes and Sustainable Development	Winter	81 university credits
GNG4170	Engineering Law	Winter	
CHG4900 or Two Technical electives		Winter	