

2015-2016 Course Sequence
BSc with Specialization in Biochemistry
BASc in Chemical Engineering
(Biotechnology Integrated Program)

1st YEAR (30 credits)

		<u>Session</u>	<u>Prerequisite(s)</u>
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)

		<u>Session</u>	<u>Prerequisite(s)</u>
CHM2120	Organic Chemistry II	Fall	CHM1321
CHM2123	Laboratory of Organic Chemistry II	Fall	Corequisite: CHM2120
ENG1112	Technical Report Writing	Fall	
NGG1106	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)

		<u>Session</u>	<u>Prerequisite(s)</u>
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	Scientific Thought and Social Values	Fall	
or			
HIS2129	Technology, Society and Environment Environment since 1800	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)

BCH4040* Honours Research – Biochemistry

Session

Fall

Prerequisite(s)

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
 BCH4932* Biochemistry Seminar Fall

BCH3170 or BIO3170

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.

BCH4040* Honours Research – Biochemistry Winter

Prerequisite or corequisite: CHG3331

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)

		<u>Session</u>
CHG3337	Data Collection and Interpretation	Fall
CHG4116	Chemical Engineering Laboratory	Fall
CHG4305	Advanced Materials in Chemical Engineering	Fall
CHG4343	Computer-Aided Design in Chemical Engineering	Fall
CHG4381	Biochemical Engineering	Fall
Technical elective		Fall
CHG4244	Plant design Project	Winter
CHG4307	Clean Processes and Sustainable Development	Winter
GNG4170	Engineering Law	Winter
CHG4900 or Two Technical electives		Winter

Prerequisite(s)

MAT2377
CHG3122, CHG3111, CHG3127, CHG3326, CHG3335. Prerequisite or corequisite: CHG3337

81 university credits

81 university credits including CHG3111, CHG3127, CHG3331, CHG3335

81 university credits including CHG3111, CHG3127

81 university credits including CHG3111, CHG3112, CHG3122, CHG3127, CHG3316, CHG3324, CHG3326, CHG3331, CHG3335, CHG3337

81 university credits