Bioengineering Curriculum - Stream 3 (Biomedical, Diagnostics and High Throughput Screening Engineering)

2016 cohort **CEGEP Entry**

1st Semester (Fall)		14 credits	Prerequisites/Co-requisites
BIEN 200	Introduction to Bioengineering	2	P - Permission of Instructor
CHEM 212	Introductory Organic Chemistry 1	4	P - CHEM 110 / C - CHEM 120
MATH 262	Intermediate Calculus	3	P - MATH 141, MATH 133
MATH 263	Ordinary Differential Equations for Engineers	3	C - MATH 262
MECH 210	Mechanics 1	2	-
2nd Semester (Winter)		16 credits	Prerequisites/Co-requisites
BIEN 210	Electrical and Optical Properties of Biological Systems	3	P - BIEN 200/ C - BIOL 112 or Permission of Instructor
BIOL 112	Cell and Molecular Biology	3	-
BREE 301	Biothermodynamics	3	-
COMP 208	Computers in Engineering	3	P - MATH 140, MATH 141
CS	Complementary Studies - Group B (HSSML)	3	-
FACC 100	Introduction to the Engineering Profession	1	-
3rd Semester (Fall)		17 credits	Prerequisites/Co-requisites
BIEN 290	Bioengineering Measurement Laboratory	4	P - BIEN 200
BIEN 310	Introduction to Biomolecular Engineering (TC STREAM 3)	3	P - BIEN 200 or Permission of Instructor
BIEN 350	Biosignals, Systems and Control	4	P - MATH 263 or Permission of Instructor
BIOL 200	Molecular Biology	3	P - BIOL 112 / C - CHEM 212
CHEM 267	Introductory Chemical Analysis (TC STREAM 3)	3	P - CHEM 110 and CHEM 120
4th Semester (Winter)		15 credits	Prerequisites/Co-requisites
BIOC 212	Molecular Mechanisms of Cell Function	3	P - BIOL 200
CCOM 206	Communication in Engineering	3	-
CHEE 310	Physical Chemistry for Engineers	3	P - CHEE 220 or MIME 212 or BREE 301
EC	Elective - 1	3	-
MATH 264	Advanced Calculus for Engineers	3	P - MATH 262 or MATH 151 or MATH 152/ C - MATH 263
5th Semester (Fall)		15 credits	Prerequisites/Co-requisites
BIEN 390	Bioengineering Laboratory	3	P - BIEN 290
BIEN 410	Computational Methods in Biomolecular Engineering (TC STREAM 3)	3	P - BIEN 310 and COMP 208 or Permission of Instructor
CHEE 314	Fluid Mechanics (TC STREAM 3)	3	P - CHEE 204 or BIEN 200 / C - MATH 264
CHEM 367	Instrumental Analysis 1 (TC STREAM 3)	3	P - CHEM 287 and CHEM 297
CIVE 281	Analytical Mechanics	3	C - MATH 262, MATH 263
6th Semester (Winter)		15 credits	Prerequisites/Co-requisites
BIEN 340	Transport Phenomena in Biological Systems 2	3	P - BIEN 200 and MATH 263
BIEN 462	Engineering Principles in Physiological Systems (TC STREAM 3)	3	P - BIEN 350 or Permission of Instructor
BIEN 530	Imaging and Bioanalytical Instrumentation (TC STREAM 3)	3	P - Permission of Instructor
FACC 300	Engineering Economy	3	-
PHYS 319	Introduction to Biophysics	3	P - BIOL 200; MATH 222/MATH 262; PHYS 230 and (PHYS 232 or PHYS 253), or Permission of Instructor
7th Semester (Fall)		15 credits	Prerequisites/Co-requisites
BIEN 470 D1	Bioengineering Design Project	3	P - BIEN 390
BIEN 520	High Throughput Bioanalytical Devices (TC STREAM 3)	3	P - Permission of Instructor
CS	Complementary Studies - Group A (Impact)	3	-
EC	Elective - 2	3	-
ECSE 415	Intro to Computer Vision (TC STREAM 3)	3	*P - ECSE 304 or ECSE 306 or Permission of Instructor
8th Semester (Winter)		15 credits	Prerequisites/Co-requisites
BIEN 470 D2	Bioengineering Design Project	3	P - BIEN 390
BIEN 471	Bioengineering Research Project	2	P - Permission of Instructor
BIEN 540	Information Storage and Processing in Biological Systems (TC STREAM 3)	3	P - Permission of Instructor
BIEN 560	Biosensors (TC STREAM 3)	3	P - Permission of Instructor
EC	Elective - 3	3	-
FACC 400	Engineering Professional Practice	1	P - FACC 100, FACC 250, and 60 program credits
		TOTAL:	**122**

The Complementary Studies (CS) courses are Impact of Technology courses (Group A) and Humanities & Social Sciences, Management Studies and Law courses (Group B). Students must take one course (3 credits) from Group A nd one course (3 credits) from Group B. The curriculum above includes suggested terms during which these courses can be taken. These must be chosen from an approved list of courses/departments, found in the program list under "Complementary Studies" in the Faculty of Engineering Undergraduate section of the Programs, Courses and University Regulations publication (www.mcgill.ca/study) (see your program listing in the "Browse Academic Units & Programs" section).

FACC 250 is not yet indicated as a prerequisite in the eCalendar course information (www.mcgill.ca/study) but it will be before FACC 400 is taken.

Elective courses (EC) can be chosen from any course at the 200-level or higher offered by the University, subject to permission of the offering department.
*Prequisites replaced with BIEN 350 for Bioengineering students