

Bioengineering Curriculum - Stream 2 (Biomolecular & Cellular 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 2)	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 - CHEM212
MATH 264	Advanced Calculus for Engineers	3	P - MATH 262 or MATH 151 or MATH 152 / C - MATH 263
4th Semester (Winter)		15 credits	Prerequisites/Co-requisites
BIEN 320	Molecular, Cellular and Tissue Biomechanics (TC STREAM 2)	3	P - BIOL 112 and MECH 210
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
FACC 300	Engineering Economy	3	-
5th Semester (Fall)		18 credits	Prerequisites/Co-requisites
BIEN 390	Bioengineering Laboratory	3	P - BIEN 290
BIEN 410	Computational Methods in Biomolecular Engineering (TC STREAM 2)	3	P - BIEN 310 and COMP 208 or Permission of Instructor
CHEE 370	Elements of Biotechnology (TC Stream 2)	3	-
CIVE 281	Analytical Mechanics	3	C - MATH 262, MATH 263
CS	Complementary Studies - Group A (Impact)	3	-
EC	Elective - 1	3	-
6th Semester (Winter)		15 credits	Prerequisites/Co-requisites
BIEN 330	Tissue Engineering and Regenerative Medicine (TC STREAM 2)	3	P - BIEN 200, CHEM 212, BIOL 112 and BIOL 200 or Permission of Instructor
BIEN 340	Transport Phenomena in Biological Systems 2	3	P - BIEN 200 and MATH 263
BIEN 590	Cell Culture Engineering (TC STREAM 2)	3	P - Permission of Instructor
EC	Elective - 2	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 510	Engineered Nanomaterials for Biomedical Applications (TC STREAM 2)	3	P - BIEN 200, CHEM 212 and BIOL 112 or Permission of Instructor
BIEN 520	High Throughput Bioanalytical Devices (TC STREAM 2)	3	P - Permission of Instructor
BIEN 550	Biomolecular Devices (TC STREAM 2)	3	P - Permission of Instructor
BIEN 570	Active Mechanics in Biology (TC STREAM 2)	3	P - Permission of Instructor
8th Semester (Winter)		12 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 2)	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.

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