

Bioengineering Curriculum - Stream 2 (Biomolecular & Cellular Engineering)

2017 cohort

Non-CEGEP Entry

1st Semester (Fall)		15 credits	Prerequisites/Co-requisites
CHEM 110	General Chemistry 1	4	-
FACC 100	Introduction to the Engineering Profession	1	-
MATH 133	Linear Algebra and Geometry	3	-
MATH 140	Calculus 1	3	-
PHYS 131	Mechanics and Waves	4	C - MATH 140
2nd Semester (Winter)		18 credits	Prerequisites/Co-requisites
BIOL 112	Cell and Molecular Biology	3	-
CHEM 120	General Chemistry 2	4	-
CS	Complementary Studies - Group B (HSSML)	3	-
MATH 141	Calculus 2	4	P - MATH 140
PHYS 142	Electromagnetism and Optics	4	P - PHYS 131 / C - MATH 141
3rd Semester (Fall)		17 credits	Prerequisites/Co-requisites
BIEN 200	Introduction to Bioengineering	2	P - Permission of Instructor
BIOL 200	Molecular Biology	3	P - BIOL 112 / C - CHEM212
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	P - PHYS 101 or PHYS 131
4th Semester (Winter)		12 credits	Prerequisites/Co-requisites
BIEN 210	Electrical and Optical Properties of Biological Systems	3	P - BIEN 200/C- BIOL 112 or Permission of Instructor
BIEN 300	Thermodynamics in Bioengineering	3	P - CHEM 120, MATH 262
BIOC 212	Molecular Mechanisms of Cell Function	3	P - BIOL 200
COMP 208	Computers in Engineering	3	P - MATH 140, MATH 141
FACC 250	Responsibilities of the Professional Engineer	0	P - FACC 100 or BREE 250
5th Semester (Fall)		14 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
MATH 264	Advanced Calculus for Engineers	3	P - MATH 262 or MATH 151 or MATH 152 / C - MATH 263
6th Semester (Winter)		15 credits	Prerequisites/Co-requisites
BIEN 320	Molecular, Cellular and Tissue Biomechanics (TC STREAM 2)	3	P - BIOL 112 and MECH 210
BIEN 360	Physical Chemistry in Bioengineering	3	P - BIEN 300
CCOM 206	Communication in Engineering	3	-
CS	Complementary Studies - Group B (HSSML)	3	-
FACC 300	Engineering Economy	3	-
7th Semester (Fall)		12 credits	Prerequisites/Co-requisites
BIEN 314	Transport Phenomena in Biological Systems 1	3	P - BIEN 200, MATH 263, BIEN 300 or permission of instructor
BIEN 410	Computational Methods in Biomolecular Engineering (TC STREAM 2)	3	P - BIEN 310 and COMP 208, or Permission of Instructor
BIEN 420	High Throughput Bioanalytical Devices (TC STREAM 2)	3	P - Permission of Instructor
CIVE 281	Analytical Mechanics	3	C - MATH 262, MATH 263
8th 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 314, BIEN 360 or permission of instructor
BIEN 390	Bioengineering Laboratory	3	P - BIEN 290
BIEN 590	Cell Culture Engineering (TC STREAM 2)	3	P - Permission of Instructor
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
9th Semester (Fall)		12 credits	Prerequisites/Co-requisites
BIEN 470 D1	Bioengineering Design Project	3	P - Permission of Instructor
BIEN 510	Engineered Nanomaterials for Biomedical Applications (TC STREAM 2)	3	P - BIEN 200, CHEM 212 and BIOL 112 or 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
10th Semester (Winter)		12 credits	Prerequisites/Co-requisites
BIEN 470 D2	Bioengineering Design Project	3	P - BIEN 390
BIEN 471	Bioengineering Research Project	2	P - BIEN 390
BIEN 540	Information Storage and Processing in Biological Systems (TC STREAM 2)	3	P - Permission of Instructor
CS	Complementary Studies - Group A (Impact)	3	-
FACC 400	Engineering Professional Practice	1	P - FACC 100, FACC 250, and 60 program credits
TOTAL:		142	

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 and 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).

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