

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

CEGEP Entry

1st Semester (Fall)		17 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
CIVE 281	Analytical Mechanics	3	C - MATH 262, MATH 263
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
BIOL 112	Cell and Molecular Biology	3	-
BREE 301	Biothermodynamics	3	-
COMP 208	Computers in Engineering	3	P - MATH 140, MATH 141
CS	Complimentary Studies - Group B (Humanities)	3	-
EC	Elective - 1	3	-
FACC 100	Introduction to the Engineering Profession	1	-
3rd Semester (Fall)		16 credits	Prerequisites/Co-requisites
BIEN 290	Bioengineering Measurement Laboratory	4	P - BIEN 200, PHYS 142
BIOL 200	Molecular Biology	3	P - BIOL 112 / C - CHEM 212
MATH 264	Advanced Calculus for Engineers	3	P - MATH 262 / C - MATH 263
TC STREAM 3 (BIEN 350)	Biosystems and Control	3	P - Permission of Instructor
TC STREAM 3 (CHEM 287)	Introductory Analytical Chemistry	2	P - CHEM 110 and CHEM 120, or CHEM 115 / C - CHEM 297
TC STREAM 3 (CHEM 297)	Introductory Analytical Chemistry Laboratory	1	P - CHEM 110 and CHEM 120, or CHEM 115 / C - CHEM 287
4th Semester (Winter)		15 credits	Prerequisites/Co-requisites
BIEN 210	Electrical and Optical Properties of Biological Systems	3	P - BIEN 200, BIOL 112
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
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
5th Semester (Fall)		15 credits	Prerequisites/Co-requisites
BIEN 390	Bioengineering Laboratory	3	P - BIEN 290
FACC 300	Engineering Economy	3	-
TC STREAM 3 (MECH 553)	Design and Manufacture of Microdevices	3	P - Permission of Instructor
TC STREAM 3 (CHEE 314)	Fluid Mechanics	3	P - CHEE 204 or BIEN 200 / C - MATH 264
TC STREAM 3 (CHEM 367)	Instrumental Analysis 1	3	P - CHEM 257 or CHEM 277 or CHEM 287 and CHEM 297
6th Semester (Winter)		13 credits	Prerequisites/Co-requisites
BIEN 340	Transport Processes in Biological Systems	3	P - Permission of Instructor
EC	Elective - 2	3	-
FACC 400	Engineering Professional Practice	1	P - FACC 100 or BREE 205, 60 program credits
TC STREAM 3 (BIEN 530)	Imaging and Bioanalytical Instrumentation	3	P - Permission of Instructor
CS	Complimentary Studies - Group A (Impact)	3	-
7th Semester (Fall)		15 credits	Prerequisites/Co-requisites
BIEN 470	Bioengineering Design Project (first half)	3	P - BIEN 390
EC	Elective - 3	3	-
TC STREAM 3 (ECSE 529)	Computer and Biological Vision	3	*P - ECSE 304 or ECSE 306
TC STREAM 3 (MECH 502)	Topics in Mechanical Engineering (Microfluids and bioMEMs)	3	-
TC STREAM 2 (PHYS 534)	Nanoscience and Nanotechnology	3	-
8th Semester (Winter)		14 credits	Prerequisites/Co-requisites
BIEN 470	Bioengineering Design Project (second half)	3	P - BIEN 390
BIEN 471	Bioengineering Research Project	2	P - Permission of Instructor
TC STREAM 3 (BIEN 520)	High Throughput and Bioanalytical Instrumentation	3	P - Permission of Instructor
TC STREAM 3 (BIEN 560)	Biosensors	3	P - Permission of Instructor
TC STREAM 3 (CIVE 558)	Biomolecular Techniques for Environmental Engineering	3	P - Permission of Instructor

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*Prerequisites replaced with BIEN 350 for Bioengineering students

Technical Complementary courses are selected from an approved list given on the next page

The Complementary Studies (CS) courses are Impact of Technology courses (Group A) and Humanities & Social Sciences, Management Studies and Law courses (Group B). These must be chosen from an approved

Elective courses (EC) may be chosen from any course at the 200-level or higher in the Desautels Faculty of Management, Faculty of Agricultural and Environmental Sciences, Faculty of Arts, Faculty of Engineering, Faculty of Religious Studies, Faculty of Science, and/or Schulich School of Music.

Technical Complementary Courses - Bioengineering

		Credits	Prerequisites/Co-requisites
BIEN 350	Biosystems and Control	3	P - Permission of Instructor
BIEN 520	High Throughput Bioanalytical Devices	3	P - Permission of Instructor
BIEN 530	Imaging and Bioanalytical Instrumentation	3	P - Permission of Instructor
BIEN 560	Biosensors	3	P - Permission of Instructor
CHEE 314	Fluid Mechanics	3	P - CHEE 204 or BIEN 200 / C - MATH 264
CHEM 287	Introductory Analytical Chemistry	2	P - CHEM 110 and CHEM 120, or CHEM 115, or equivalent. C - CHEM
CHEM 297	Introductory Analytical Chemistry Laboratory	1	P - CHEM 110 and CHEM 120, or CHEM 115, or equivalent. C - CHEM
CHEM 367	Instrumental Analysis 1	3	P - CHEM 257 or CHEM 277 or CHEM 287 and CHEM 297
CIVE 558	Biomolecular Techniques for Environmental Engineering	3	P - Permission of Instructor
ECSE 529	Computer and Biological Vision	3	*P - ECSE 304 or ECSE 306
MECH 502	**Topics in Mechanical Engineering	3	P - CIVE 225 or Permission of Instructor
MECH 553	Design and Manufacture of Microdevices	3	-
PHYS 534	Nanoscience and Nanotechnology	3	-

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**When topic is appropriate, as: Microfluidics and bioMEMs.

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