

Stream 3 - Biomedical, Diagnostics and High Throughput Screening Engineering

Non-CEGEP Entry

		15 credits	Prerequisites/Co-requisites
CHEM 110	General Chemistry 1	4	P - College level mathematics and physics or permission of instructor
FACC 100	Introduction to the Engineering Profession	1	-
MATH 133	Linear Algebra and Geometry	3	P - A course in functions
MATH 140	Calculus 1	3	P - High school calculus
PHYS 131	Mechanics and Waves	4	C - MATH 139
		18 credits	Prerequisites/Co-requisites
BIOL 112	Cell and Molecular Biology	3	-
CHEM 120	General Chemistry 2	4	P - College level mathematics and physics or permission of instructor
MATH 141	Calculus 2	4	P - MATH 140
PHYS 142	Electromagnetism and Optics	4	P - PHYS 131 / C - MATH 141
CS	Complementary Studies Group B (HSSML) - 1*	3	-
		18 credits	Prerequisites/Co-requisites
BIEN 200	Introduction to Bioengineering	2	-
BIEN 219	Introduction to Physical Biology of the Cell	4	P - BIOL 112 / C - CHEM 212
CHEM 212	Introductory Organic Chemistry 1	4	P - CHEM 110 / C - CHEM 120
MATH 262	Intermediate Calculus	3	P - MATH 133, MATH 141
MATH 263	Ordinary Differential Equations for Engineers	3	C - MATH 262
MECH 210	Mechanics 1	2	P - PHYS 101 or PHYS 131 or equivalent
		12 credits	Prerequisites/Co-requisites
BIEN 210	Electrical and Optical Properties of Biological Systems	3	P - BIEN 200 / C - BIOL 112
BIEN 300	Thermodynamics in Bioengineering	3	P - CHEM 120, MATH 262
COMP 208	Computers in Engineering	3	P - MATH 141 / C - MATH 133
FACC 250	Responsibilities of the Professional Engineer	0	P - FACC 100 or BREE 250
MATH 203	Principles of Statistics 1	3	-
		13 credits	Prerequisites/Co-requisites
BIEN 290	Bioengineering Measurement Laboratory	3	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
CHEM 267	Introductory Chemical Analysis (TC Stream 3)	3	P - CHEM 110 and CHEM 120, or equivalent
		12 credits	Prerequisites/Co-requisites
CCOM 206	Communication in Engineering	3	-
BIEN 360	Physical Chemistry in Bioengineering	3	P - BIEN 300
MATH 264	Advanced Calculus for Engineers	3	P - MATH 262 or MATH 151 or MATH 152 / C - MATH 263
CS	Complementary Studies Group A (Impact)	3	-
		15 credits	Prerequisites/Co-requisites
BIEN 314	Transport Processes in Biological Systems 1	3	P - BIEN 200, MATH 263, BIEN 300 or permission of instructor
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
CIVE 281	Analytical Mechanics	3	C - MATH 262, MATH 263
CHEM 367	Instrumental Analysis 1 (TC Stream 3)	3	P - CHEM 267
		15 credits	Prerequisites/Co-requisites
BIEN 340	Transport Processes in Biological Systems 2	3	P - BIEN 314 and BIEN 360 or permission of instructor
BIEN 462	Engineering Principles in Physiological Systems (TC Stream 3)	3	P - BIEN 350 or permission of instructor
BIEN 530	Imaging and Bioanalytical Instrumentation	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
		12 credits	Prerequisites/Co-requisites
BIEN 470D1	Bioengineering Design Project	3	P - BIEN 390

Engineering Science and Design Technical Complementaries

Starting in the third year (second year for CEGEP students) (Year 2), students will need to take 36 credits of courses to upgrade their general knowledge of Bioengineering. While it is not mandatory, it is highly recommended that the students choose all courses in one of the three streams of bioengineering knowledge and practice: 1) Biological Materials and Mechanics (37 credits); 2) Biomolecular and Cellular Engineering (36 credits); or 3) Biomedical, Diagnostics and High Throughput Screening Engineering (36 credits) [as indicated above]. However, students may satisfy the Bioengineering Complementary Courses requirement by taking a minimum of 30 credits from the Engineering Science and Design Complementaries course list and 6 credits of any other courses in the Stream course lists.

33-34 credits from the following:

		Credits	Prerequisites/Co-requisites
BIEN 310	Introduction to Biomolecular Bioengineering	3	P - BIEN 200 or permission of instructor
BIEN 410	Computational Methods in Biomolecular Engineering	3	P - BIEN 310 and COMP 208, or instructor permission
BIEN 462	Engineering Principles in Physiological Systems	3	P - BIEN 310 and COMP 208, or instructor permission
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 267	Introductory Chemical Analysis	3	P - CHEM 110 and CHEM 120, or equivalent.
CHEM 367	Instrumental Analysis 1	3	P - CHEM 267
ECSE 415	Introduction to Computer Vision	3	P - (ECSE 304 or ECSE 306 or ECSE 206 or ECSE 316) and ECSE 205.
PHYS 534	Nanoscience and Nanotechnology	3	

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For the official program listing, see the *Programs, Courses and University Regulations* publication (www.mcgill.ca/study).