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

2018 cohort

Non-CEGEP Entry

1st Semester (Fall) 15 credits Prerequisites/Co-requisites
CHM 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 - MATH 140

2nd Semester (Winter) 18 credits Prerequisites/Co-requisites
BIOI 112 Cell and Molecular Biology 3 -
CHEM 120 General Chemistry II 4 -
CS Complementary Studies - Group B (HSML) 3 -
MATH 141 Calculus II 4 P - MATH 140
PHYS 142 Electromagnetism and Optics 4 P - PHYS 131/C - MATH 141

3rd Semester (Fall) 14 credits Prerequisites/Co-requisites
BIEN 200 Introduction to Biotechnology 2 P - Permission of Instructor
CHEM 212 Introductory Organic Chemistry I 4 P - CHEM 112/C - CHEM 120
MATH 262 Intermediate Calculus 3 P - MATH 141, MATH 133
MATH 263 Ordinary Differential Equations for Engineers 3 P - 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 305 Thermodynamics in Biotechnology 3 P - CHEM 120, MATH 262
CS 208 Computers in Engineering 3 P - MATH 140, MATH 141
FACC 250 Responsibilities of the Professional Engineer 0 P - FACC 100 or BREE 250
MATH 203 Principles of Statistics I 3

5th Semester (Fall) 17 credits Prerequisites/Co-requisites
BIEN 219 Introduction to Physical Biology of the Cell 4 P - BIOL 112/C - CHEM 212
BIEN 290 Biotechnology Measurement Laboratory 3 P - BIEN 200
BIEN 310 Introduction to Biomolecular Engineering (TC STREAM 3) 3 P - BIEN 200 or Permission of Instructor
CHEM 350 Bioinformatics, Systems and Control 4 P - MATH 263 or Permission of Instructor
CHEM 367 Introductory Chemical Analysis (TC STREAM 3) 3 P - CHEM 110 and CHEM 120, or CHEM 115

6th Semester (Winter) 12 credits Prerequisites/Co-requisites
BIEN 365 Physical Chemistry in Biotechnology 3 P - CHEM 120, MATH 262
CCOM 206 Communication in Engineering 3 -
CS Complementary Studies - Group A (Impact) 3
MATH 264 Advanced Calculus for Engineers 3 P - MATH 262 or MATH 151 or MATH 152/C - MATH 263

7th Semester (Fall) 15 credits Prerequisites/Co-requisites
BIEN 314 Transport Phenomena in Biological Systems I 3 P - BIEN 200, MATH 263, BIEN 300 or permission of instructor
BIEN 390 Biotechnology Laboratory 3 P - BIEN 290
BIEN 410 Computational Methods in Biotechnology (TC STREAM 3) 3 P - BIEN 310 and CS 208 or Permission of Instructor
CHEM 367 Instrumental Analysis 1 (TC STREAM 3) 3 P - CHEM 267
CIVE 281 Analytical Mechanics 3 C - MATH 262, MATH 263

8th Semester (Winter) 15 credits Prerequisites/Co-requisites
BIEN 345 Transport Phenomena in Biological Systems 2 3 P - BIEN 314, 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 Biophysical 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

9th Semester (Fall) 12 credits Prerequisites/Co-requisites
BIEN 470 D1 Bioengineering Design Project 3 P - BIEN 390
BIEN 520 High Throughput Biomedical Devices (TC STREAM 3) 3 P - Permission of Instructor
CS Complementary Studies - Group B (HSML) 3 -
ECSE 415 Intro to Computer Vision (TC STREAM 3) 3 P - ECSE 304 or ECSE 306 or 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 - 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
FACC 400 Engineering Professional Practice 1 P - FACC 100, FACC 250, and 60 program credits

TOTAL: 142