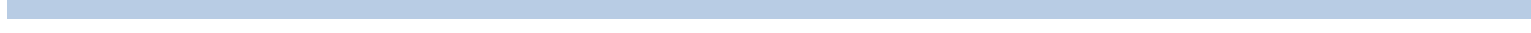


# Bioengineering Curriculum - Stream 1 (Biological Materials & Mechanics)

2024 cohort

Non-CEGEP Entry

1st Semester (Fall)		15 credits	Prerequisites/Co-requisites
CHEM 110	<a href="#">General Chemistry 1</a>	4	-
FACC 100	<a href="#">Introduction to the Engineering Profession</a>	1	-
MATH 133	<a href="#">Linear Algebra and Geometry</a>	3	-
MATH 140	<a href="#">Calculus 1</a>	3	-
PHYS 131	<a href="#">Mechanics and Waves</a>	4	C - MATH 140
2nd Semester (Winter)		18 credits	Prerequisites/Co-requisites
BIOL 112			



## Engineering Science and Design Technical Complementaries

Starting in the third year (second year for CEGEP students) (Year 2/U2), students will need to take 24-25 credits of Technical Complementary courses to upgrade their general knowledge of Bioengineering. Students must register for the required Technical Complementary courses in one of the three streams of bioengineering knowledge and practice: 1) **Biological Materials and Mechanics (25 credits)**; 2) Biomolecular and Cellular Engineering (24 credits); or 3) Biological Information and Computation (24-25 credits).

### The courses listed below may be taken as List B Technical Complementaries in STREAM 1

Select 4 List B TCs (12 credits)

Course number	Course name	Credits	Prerequisites/Co-requisites
BIEN 330	Tissue Engineering and Regenerative Medicine	3	P - BIEN 200, BIOL 112, BIOL 200, and CHEM 212, or instructor permission
BIEN 414	Fundamentals and Rheology of Biological Fluids	3	P - MATH 262 and BIEN 314, or permission of the instructor
BIEN 450	Biological Structures and Assemblies	3	P - BIEN 219 or permission of instructor
BIEN 462	Engineering Principles in Physiological Systems	3	P - BIEN 350 or permission of instructor
BIEN 500	Special Topics in Bioengineering	3	P - Permission of Instructor, Not open to students who took MECH 500 (W2020)
BIEN 510	Engineered Nanomaterials for Biomedical Applications	3	P - BIEN 200, CHEM 212, and BIOL 112, or instructor permission
BIEN 530	Imaging and Bioanalytical Instrumentation	3	P - Permission of instructor
BIEN 535	Electron microscopy and 3D imaging for biological materials	3	P - Permission of instructor
BIEN 545	Medical diagnostics at the point of care	3	P - Permission of instructor
BIEN 550	Biomolecular Devices	3	P - Permission of instructor
BIEN 580	Synthetic Biology	3	P - Permission of instructor
BIEN 585	Metabolic Engineering	3	P - Permission of instructor
BMDE 503	Biomedical Instrumentation	3	P - Experience with differential equations, in particular Laplace Transforms and complex numbers (e.g. MATH 263 or MATH 381 or equivalent) or permission of instructor
BMDE 504	Biomaterials and Bioperformance	3	P - U4 students only
BMDE 505	Cell and Tissue Engineering	3	P - U4 students only
BMDE 512	Finite Element Modelling	3	P - Differential equations (MATH 271 or equivalent) or permission of instructor
CHEE 563 or MECH 563	Biofluids and Cardiovascular Mechanics	3	P - CHEE 314 or MECH 331 or instructor permission
MECH 321	Mechanics of Deformable Solids.	3	P - CIVE 207
MECH 547	Mechanics of Biological Materials	3	P - MECH 210 and MIME 260 / 261, or instructor permission
MECH 561	Biomechanics of Musculoskeletal Systems	3	P - MECH 321 and permission of instructor
MECH 572	Mechanics and Control of Robotic Manipulators	3	P - BIEN 350 and permission of instructor
MIME 470	Engineering Biomaterials	3	P - MIME 261 or permission of instructor
MIME 473	Introduction to Computational Materials Design	3	P - MIME 209 and MIME 261, or permission of instructor.
SEAD 515	Climate Change Adaptation and Engineering Infrastructure	3	P - Permission of instructor
SEAD 520	Life Cycle-Based Environmental Footprinting	3	P - Permission of instructor
SEAD 530	Economics for Sustainability in Engineering and Design	3	P - Permission of instructor
SEAD 540	Industrial Ecology and Systems	3	P - Permission of instructor
SEAD 550	Decision-Making for Sustainability in Engineering and Design	3	P - Permission of instructor

**NOTE: Maximum 6 credits of SEAD courses are allowed.**