

(CHE2) BIOENGINEERING - BIOCHEMICAL, BIOMEDICAL, BIOENVIRONMENTAL SUB-PLAN, B.A.SC. (2024)

Second Year CORE 2021-2022

Code	Title	Units
CHEE 209	Analysis Of Process Data	3.50
CHEE 221	Chemical Processes And Systems	3.50
CHEE 229	Cell Based Engineering Princip	4.00
ENCH 211	Main Group Chemistry	4.75
MTHE 225	Ordinary Differential Equations	3.50
ENCH 212	Princip Of Chem Reactivity	4.00
APSC 200	Engineering Design & Practice II	4.00
APSC 293	Engineering Communications	1.00
CHEE 210	Thermodynamics of Energy Conversion Systems	3.50
CHEE 218	Laboratory Projects I	2.50
CHEE 222	Process Dynamics & Num Methods	3.50
CHEE 223	Fluid Mechanics	3.50
ENCH 245	Applied Organic Chemistry I	4.75
Total Units		46.00

Third Year CORE 2022-2023

Code	Title	Units
APSC 221	Economic And Business Practice	3.00
CHEE 311	Fluid Phase And Reaction Equilibrium	3.50
CHEE 321	Chemical Reaction Engineering	3.50
CHEE 330	Heat And Mass Transfer	3.50
CHEE 342	Environmental Biotechnology	3.50
CHEE 380	Biochemical Engineering	3.50
CHEE 315	Laboratory Projects II	4.00
CHEE 319	Process Dynamics & Control	3.50
CHEE 331	Design of Unit Operations	4.50
CHEE 340	Biomedical Engineering	3.50
CHEE 361	Engineering Communications, Ethics & Professionalism	1.00
CHEE 371	Mitigation of Industrial Pollution	3.50
Elective - Complementary Studies		3.00
Total Units		43.50

Note: It is recommended that students take APSC 221 Economic And Business Practice during the fall term in preparation for CHEE 331 Design of Unit Operations in the winter term.

Fourth Year CORE 2023-2024

Code	Title	Units
CHEE 418	Strategies Proc Investigations	3.50
CHEE 452	Transport Phenomena in Physiological Systems ²	3.50
CHEE 471	Chemical Process Design	7.00
Elective - Technical Elective		9.00
Elective - Complementary Studies		6.00
Select from the following:		7.00
APSC 400	Technology, Engineering & Management (TEAM)	
APSC 401	Interdisciplinary Projects (PLUS a TECH elective) ¹	
APSC 480	Multi-disciplinary Industry	
CHEE 408	Bioengineering Research Project	
CHEE 410	Engineering Innovation and Entrepreneurship (PLUS a TECH elective) ¹	
CHEE 420	Laboratory Projects III (PLUS a TECH elective) ¹	
Total Units		36.00

¹ **PLUS a technical elective from either Group A or Group B count together as one choice.** This technical elective is counted separate from the technical elective requirements of the program.

² For 2023-2024 only students will take CHEE 412 in the fall term instead of CHEE 452 in the winter term.

Technical Electives

Students in the CHE2 Bioengineering - Biochemical, Biomedical, Bioenvironmental sub-plan take one technical elective (TECH) course from the Technical Electives Group A list and two (2) courses from either the Technical Electives Group A or Technical Electives Group B technical electives list. NOTE: Students in the Bioengineering option are encouraged to select electives from the relevant elective groupings.

Chemical Process and Bioengineering Sub-plan: Technical Electives (<https://queensu-ca-public.courseleaf.com/engineering-applied-sciences/academic-plans/chemical-engineering/chemical-process-bioengineering-sub-plan-technical-electives/>)



Complementary Studies

Students choose a total of 9 credits from the approved Lists A or B, of which 3 credits must be taken from List A.

Refer to the Complementary Studies section of this calendar for details regarding the requirements for all Engineering plans.

Engineering Economics

To meet the engineering economics requirement, students take APSC 221 Economic And Business Practice (this is a CORE course).

Communications

To meet the communications course requirement, students take APSC 293 Engineering Communications and CHEE 361 Engineering Communications, Ethics & Professionalism (these are CORE courses).