

Bachelor of Science - General Concentration Course Planning Guide

The following information regarding course prerequisites is meant to help students prepare for the Bachelor of Science Concentrations

- Biomedical Concentration
- Computation Science Concentration
- Environmental Science Concentration

Students are encouraged to choose their concentration as early in their degree as possible to help guide their course selections.

Students may choose more than one concentration but should note that this may increase their required courses and/or the time needed to complete the degree.

Important Notes:

- Third- and fourth-year courses ***are not offered every year*** and the courses marked ***in red*** will not be offered in the next 2 years. Students should complete all the prerequisites listed below to ensure that they are eligible to take whichever courses are being offered. A list of expected course offerings for the following academic year is published every spring.
- All BSc Students must complete SCI 400 (3.00)
Prerequisites: STAT 310 (C-) and one of BIOL 300 (C-), BIOL 408 (C-), CHEM 311 (C-), PHYS 310 (C-), COMP 320 (C-) or COMP 330 (C-).



Biomedical Concentration

At minimum, learners should take the following prerequisites as lower-level science electives:

- BIOL 111, BIOL 200, BIOL 209, BIOL 214
- CHEM 111, CHEM 204, CHEM 211, CHEM 215

Biomedical Concentration Courses (with prerequisites listed):

- BIOL 300: Molecular Genetics (4.00)
Prerequisites: BIOL 200 (C-) and one of BIOL 214 (C-) or BIOL 203 (C-)

Select **three** courses from the approved list of Biomedical Sciences below:

- BIOL 312: Human Physiology I: Brains, Hormones and Guts (3.00) – *not offered*
Prerequisites: BIOL 209 (C-) and CHEM 215 (C-)
- BIOL 313: Human Physiology II (3.00)
Prerequisites: BIOL 209 (C) and CHEM 215 (C-)
- BIOL 314: Advanced Cell Biology (3.00)
Prerequisites: BIOL 214 (C-); and BIOL 215 (C-) or CHEM 215 (C-)
- BIOL 403: Microbiology and Immunology (3.00) – *not offered*
Prerequisites: BIOL 203 (C-) or BIOL 214 (C-); and BIOL 215 (C-) or CHEM 215 (C-)
- CHEM 315: Biochemistry II: Metabolism and Bioenergetics (3.00)
Prerequisites: CHEM 211 (C-) and CHEM 204 (C-), or CHEM 201 (C-); and BIOL 215 (C-) or CHEM 215 (C-)
- CHEM 411: Medicinal Chemistry: Drug Design and Drug Action (3.00)
Prerequisites: CHEM 211 (C-) and CHEM 204 (C-), or CHEM 201 (C-); and BIOL 215 (C-) or CHEM 215 (C-)



Computational Science Concentration

At minimum, students should take the following prerequisites as lower-level science electives:

- COMP 215
- MATH 109 or 126; MATH 124; MATH 252
- STAT 205 (*recommended*)

Computational Science Concentration Courses (with prerequisites listed):

Select one of the options from the following list:

- COMP 320: Database Technologies and Applications (4.00)
Prerequisites: 45 credits of 100-level or higher coursework and COMP 215
- COMP 330: Data Wrangling: Scripting for Automated Data Processing (4.00)
Prerequisites: 45 credits of 100-level or higher coursework and one of COMP 115 (A-) or COMP 215

Select **three** courses from the approved list of Computational Sciences below:

- COMP 301: Computing Technologies in a Digital Culture (3.00)
*Prerequisites: 45 credits of 100-level or higher coursework **and** one of COMP 101 or COMP 115 or MOPA 209*
- COMP 320: Database Technologies and Applications (4.00)
*Prerequisites: 45 credits of 100-level or higher coursework **and** COMP 215*
- COMP 330: Data Wrangling: Scripting for Automated Data Processing (4.00)
*Prerequisites: 45 credits of 100-level or higher coursework **and** one of COMP 115 (A-) or COMP 215*
- MATH 330: Mathematical Modelling (3.00) – *not offered*
*Prerequisites: 45 credits of 100-level or higher coursework including: MATH 109 or MATH 126; **and** MATH 200 or MATH 252*
- MATH 336: Applied Graph Theory and Optimization (3.00)
Prerequisites: 45 credits of 100-level or higher coursework including MATH 124
- MATH 400: Introduction to Machine Learning (3.00) – *not offered*
*Prerequisites: STAT 305; **and** MATH 108 or MATH 116*
- STAT 305: Introduction to Big Data Analysis (3.00)
*Prerequisites: COMP 115 **and** one of STAT 101, STAT 205, LBST 201, BADM 210, PSYC 213, TOUR 350 or KINE 302*
- STAT 310: Predictive Modelling and Analysis of Experimental Data (3.00)
Prerequisites: 45 credits 100-level or higher coursework including one of STAT 101, STAT 205, LBST 201, BADM 210, PSYC 213, TOUR 350 or KINE 302



Environmental Science Concentration

At minimum, students must take the following prerequisites as lower-level science electives:

- BIOL 111, BIOL 208
- CHEM 111, CHEM 211, CHEM 204

Environmental Science Concentration Courses (with prerequisites listed):

Select one of the options from the following list:

- BIOL 408: Ecosystem Restoration (4.00)
Prerequisites: BIOL 208 (C-)
- CHEM 311: Applications of Spectroscopy (4.00)
Prerequisites: CHEM 201 (C-); or CHEM 211 (C-) and CHEM 204 (C-)
- PHYS 310: Environmental Physics Lab (4.00)
Prerequisites: PHYS 210 or PHYS 211; OR STAT 205 and one of: CHEM 200, CHEM 201, CHEM 206, CHEM 211, BIOL 203, BIOL 208, BIOL 214, or BIOL 215

Select one of the options from the following list:

- STAT 310: Predictive Modelling and Analysis of Experimental Data (3.00)
Prerequisites: 45 credits 100-level or higher coursework including one of STAT 101, STAT 205, LBST 201, BADM 210, PSYC 213, TOUR 350 or KINE 302
- MATH 330: Mathematical Modelling (3.00) – *not offered*
Prerequisites: 45 credits of 100-level or higher coursework including: MATH 109 or MATH 126; and MATH 200 or MATH 252

Select **two** courses from the approved list of Environmental Sciences below:

- BIOL 308: Conservation Biology (3.00)
Prerequisites: BIOL 208 (C-)
- BIOL 408: Ecosystem Restoration (4.00)
Prerequisites: BIOL 208 (C-)
- CHEM 304: Environmental Chemistry (3.00)
Prerequisites: CHEM 201 (C-); or CHEM 211 (C-) and CHEM 204 (C-)
- CHEM 311: Applications of Spectroscopy (4.00)
Prerequisites: CHEM 201 (C-); or CHEM 211 (C-) and CHEM 204 (C-)
- CHEM 404: Green Chemistry (4.00) – *not offered*
Prerequisites: CHEM 201 (C-); or CHEM 211 (C-) and CHEM 204 (C-)
- PHYS 300: Environmental Thermodynamics (3.00) – *not offered*
Prerequisites: MATH 230 and PHYS 203
- PHYS 310: Environmental Physics Lab (4.00)
Prerequisites: PHYS 210 or PHYS 211; OR STAT 205 and one of: CHEM 200, CHEM 201, CHEM 206, CHEM 211, BIOL 203, BIOL 208, BIOL 214, or BIOL 215