

Should I take the Mathematics-First Pathway or the Chemistry-First Pathway for my First Year?

- **Biology majors** with an **Organismal or General Concentration** should take the Mathematics-First Pathway and focus on mathematics strengthening and preparation so they are aptly prepared for General Chemistry in their second year. One must take either MATH 108 or MATH 111 as a degree requirement. For students who have not completed 3 years of high school algebra-based math, we recommend taking MATH 102 in the first semester in preparation for MATH 108 in a subsequent semester.
- **Biology majors** with a **Biomedical or General Concentration** should take the Chemistry-First Pathway and register for CHEM 105, if they satisfy the criteria given in the “Guidance in Mathematics” section below. See the “How do I know if I’m ready for General Chemistry?” section below to ensure you take the right Chemistry course.
- **Biology majors with Teaching Certification** should take the Chemistry-First Pathway and register for CHEM 105, if they satisfy the criteria given in the “Guidance in Mathematics” section below. See the “How do I know if I’m ready for General Chemistry?” section below to ensure you take the right Chemistry course.
- **Molecular Biology majors** should take the Chemistry-First Pathway and register for CHEM 105, if they satisfy the criteria given in the “Guidance in Mathematics” section below. See the “How do I know if I’m ready for General Chemistry?” section below to ensure you take the right Chemistry course.
- **Environmental Science majors** should take the Mathematics-First Pathway if they have not completed 3 years of high school algebra-based math. MATH 102, while not a degree requirement for this major, is a recommended preparatory course for later success in CHEM 105.
- **Biopsychology majors** can elect to take the Chemistry-First or Mathematics-First Pathway. Read the criteria given in the “Guidance in Mathematics” and “How do I know if I’m ready for General Chemistry?” sections below to make the most appropriate registration decisions.
- **Sustainability Studies majors** are not required to take chemistry.

Students entering under the Student Success Pathway are strongly encouraged to register for MATH 102 in their first semester and no chemistry course. Although MATH 102 is not a degree requirement, the course is excellent preparation for success in chemistry later.

Guidance in Mathematics

Before taking chemistry or calculus, some students benefit from strengthening their mathematical skills. If students have taken and earned an A or B in Advanced Mathematics, Algebra 3, Precalculus, or Calculus, then they can decide to take the Chemistry-First Pathway and register for CHEM 105 - General Chemistry I. If they have not taken Algebra 3, Precalculus, or Calculus or have received a C+ or lower, then they should take the Mathematics-First Pathway and are advised to enroll in MATH 102 and NOT IN CHEM 105 in the first semester. MATH 102 - The Mathematics of Growth presents essential concepts in mathematical modeling, data analysis, and problem solving through contemporary applications. Course content includes arithmetic, quadratic, geometric, and logistic growth, as well as topics in statistics such as the graphical interpretation of data and statistical techniques. Though not a required course for majors in Biology or Environmental Science, MATH 102 provides excellent preparation for success in CHEM 105 and MATH 108 in later semesters. Sections of MATH 102 are offered during both the fall and spring semesters. Alternatively, MATH 105 - Precalculus for the Sciences is designed to strengthen and increase the understanding of algebraic and trigonometric concepts in preparation for MATH 111 - Calculus I. Topics include inequalities, polynomials, linear and quadratic equations, rational functions, logarithmic and exponential

functions, and trigonometry, as well as analyzing their graphs. Sections of MATH 105 are offered over the summer and during the fall semester.

How do I know if I'm ready for General Chemistry? (not required for Sustainability Studies)

Students who have never taken high school chemistry must start with CHEM 101 Introductory College Chemistry. Those with a foundation in high school chemistry can register for CHEM 105 General Chemistry I.

A solid grasp of algebra is critical for success in General Chemistry. On the first day of class, students in CHEM 105 will take a brief math readiness assessment. Those identified as needing additional math preparation may be directed to CHEM 101 or a supporting math course (MATH 102 or MATH 105)

For those starting with CHEM 101 or choosing additional math preparation in the fall semester, CHEM 105 is also offered in the Spring and CHEM 106 is taught in the summer. As such, these students can be 'on track' to start Organic Chemistry in their sophomore year! Alternatively, **most students in the Biological Sciences can delay General Chemistry** until their sophomore year and still graduate on time; **talk with your academic advisor** about your specific situation.

Will I need to take calculus?

Biology, Biology with Teaching Certification, and Molecular Biology each require calculus (one semester) and statistics. Environmental Science, Sustainability Studies, and Biopsychology require only statistics. Neither calculus nor statistics needs to be taken in the first semester. Students in Biology, Biology with Teaching Certification, and Molecular Biology should take calculus within their first two years, prior to taking physics. Either MATH 108 or MATH 111 satisfies the calculus requirement (and medical schools). MATH 108 Intuitive Calculus with Applications does not include trigonometric functions. MATH 111 - Calculus I covers a narrower breadth of calculus in more depth and includes an interactive lab component.