

REED COLLEGE MATHEMATICS AND COMPUTER SCIENCE COURSES: A GUIDE FOR NEW STUDENTS

Students at Reed can take a number of mathematics, statistics, and computer science courses when entering the college. The purpose of this document is to help them and their advisers navigate their choices and self-select into an engaging course appropriate for their background. The material here should be referenced in parallel with the official course descriptions available at <https://www.reed.edu/math/courses.html>. Please note that the mathematics department is happy to assist if students or advisers have questions.

Math 111: Calculus. Math 111 covers both differential and integral single-variable calculus. It can be appropriate for students with or without prior exposure to calculus in high school, though students should note that with an AP score of 5 on the AB exam or 4 or 5 on the BC exam, they may skip this course and receive one unit of credit. (See <https://www.reed.edu/apply/guide-to-applying/first-year/ap-guide.html> for information on IB credit.) Students without AP or IB credit but who have significant calculus preparation should meet with a math faculty member to determine whether to skip Math 111. In 2018, the math department is piloting sections of Math 111 that cater to particular audiences or have a specific emphasis. See <https://www.reed.edu/math/math111-descriptions.html> for details.

Math 112: Introduction to Analysis. This course introduces the properties of the real and complex number systems that provide the foundational underpinnings of calculus; it also serves as a first introduction to rigorous mathematical reasoning and proof. It has Math 111 or equivalent as a prerequisite and is foundational for the material covered in Math 201: Linear Algebra and Math 202: Vector Calculus. In rare circumstances (e.g., prior college-level mathematics coursework involving some analysis), some students may be able to skip this course after conferring with math department faculty.

Math 113: Discrete Structures. Despite its numbering, Math 113 is independent of Math 111 and Math 112 and has no college prerequisites. The course focuses on problem-solving methods in combinatorics (advanced counting), number theory (properties of the integers), and probability (mathematical likelihood). Students looking for a non-calculus-based introduction to college-level mathematics are welcome in this course; it is also a requirement for math and computer science majors.

Math 141: Introduction to Probability and Statistics. This course provides a deep introduction to how data are used to reason about the world. It requires no previous experience with statistics, calculus, or computer science but even students that have received a 4 or 5 on the AP statistics exam find it useful. The course covers the elementary tools of data science and descriptive analysis as well as the statistical models starting with classical inference and extending to generalized linear models. Underpinning all of the work is the language of probability and the tools of computation, namely the R programming language.

Computer Science 121: Computer Science Fundamentals I. This course is an introduction to the core concepts of computer science, mostly through the lens of Python programming. It requires absolutely no prior familiarity with computers of any kind. It is the typical first course for computer science majors, as well as an excellent course for students from other majors looking to get introduced to the field. There is no automatic placement out of 121 (regardless of AP or IB scores), but students with significant programming experience are encouraged to talk to a computer science professor about whether they should skip the class.

Computer Science 221: Computer Science Fundamentals II. This second course in computer science introduces students to the lower-level components of a computer and teaches advanced programming techniques using C++. Students who skip CSCI 121 should take this their first year instead. Some students eager to move quickly through the major also take this in the spring after taking CSCI 121 in the fall, but the majority of students take this course during their second year. It is also a good second course for non-majors interested in strengthening their programming ability.