

# MATHEMATICS 2009-10



## UNIVERSITY OF CALIFORNIA, SANTA CRUZ

### THE MATHEMATICS MAJOR

Within the mathematics major, there are three concentrations leading to the B.A. degree: pure mathematics, mathematics education, and computational mathematics. These programs are designed to give students a strong background for graduate study, for teaching, or for work in industry or government. The mathematics program also provides an excellent liberal arts background from which to pursue a variety of career opportunities.

### STUDY AND RESEARCH OPPORTUNITIES

- ◆ B.A. with concentrations in pure mathematics, mathematics education, and computational mathematics
- ◆ Undergraduate minor

### HIGH SCHOOL PREPARATION

High school students planning to major or minor in mathematics at UC Santa Cruz should complete the high school courses required for UC admission and obtain a strong background in mathematics, including courses in algebra, geometry, and trigonometry.

Students must meet the prerequisite for each Math course they take at UCSC, including their first Math course (College Algebra, Precalculus, or Calculus). A CSU/UC Mathematics Placement Exam is given at orientations and every quarter, just prior to the beginning of classes and priority enrollment. (See the *UC Santa Cruz Mathematics Placement Exam* section on the reverse.)

High school course credit cannot be used for placement; however, a score of 4 or 5 on the calculus Advanced Placement AB Exam allows students to enroll in second-quarter calculus; a score of 3 on the AP AB Exam allows students to enroll in first-quarter calculus. A score of 4 or 5 on the BC Exam gains students entry to third-quarter calculus. A score of 5, 6, or 7 on the IB HL Mathematics Exam allows students to enroll in second-quarter calculus. Scores must be verified by an academic adviser.

### TRANSFER PREPARATION

Transfer students may find it helpful to complete IGETC general education requirements before transferring to UC Santa Cruz. Those planning to major in mathematics should optimally have courses in single variable differential and integral calculus. Courses in differentiation and integration of multivariable calculus are recommended only if they are equivalent to UC Santa Cruz courses. Students transferring from California community colleges may check the Mathematics Department articulation web site for equivalent courses, and all transfer students should read the information on the review process for transfer math courses: [www.math.ucsc.edu/Undergraduate/transfer.html](http://www.math.ucsc.edu/Undergraduate/transfer.html).

It is also recommended that transfer students complete, prior to transfer, a course in linear algebra and one in ordinary differential equations. All transfer students should meet with the Mathematics Department adviser to establish a two-year plan.

### CAREERS

Actuarial science	Insurance
Avionics	Numerical analysis
Civil service	Operations research
Computer programming	Psychometrics
Computer hardware or software design	Quality control analysis
Cryptanalysis	Robotics
Economic analysis	Statistics
Financial operations analysis	Systems analysis
Forensic mathematics	Teaching
Information systems analysis	

*These are only samples of the field's many possibilities.*

## PREMAJOR REQUIREMENTS

Premajor requirements for all concentrations in the mathematics major are:

- Mathematics 20A-B, *Honors Calculus* (two quarters) or Mathematics 19A-B, *Calculus for Science, Engineering, and Mathematics* (two quarters)
- Mathematics 21, *Linear Algebra*
- Mathematics 23A-B, *Multivariable Calculus* (two quarters)

The mathematics education concentration has one additional premajor requirement, Applied Mathematics and Statistics 5, *Statistics*. For some non-mathematics majors, Mathematics 11A-B, *Calculus with Applications* (two quarters) can be substituted for *Calculus for Science, Engineering, and Mathematics* (two quarters), but they are not recommended for students planning to major in computer engineering, computer science, electrical engineering, information systems management, or physics. Although not considered a premajor requirement, Mathematics 100, *Introduction to Proof and Problem Solving*, is a prerequisite for most upper-division mathematics courses.

## UC SANTA CRUZ MATHEMATICS PLACEMENT EXAM

Mathematics placement exam (MPE) scores are valid for one year. Students whose areas of study require precalculus or calculus courses are strongly advised to take the placement exam and the required courses early in their academic careers. The placement exam is offered twice at the beginning of the quarter and once in the middle of the quarter. The exam is also offered at orientations for incoming students. A current photo ID is required for entry into the placement exam.

<i>If your MPE score is</i>	<i>You may enroll in this course</i>
12–19	2, <i>College Algebra for Calculus</i>
20–30	3, <i>Precalculus</i>
31–39	11A, <i>Calculus with Applications*</i>
40–45	19A, <i>Calculus for Science, Engineering, and Mathematics</i>
46 or higher	19A, <i>Calculus for Science, Engineering, and Mathematics</i> or 20A, <i>Honors Calculus</i>

\*Students who plan to major in computer engineering, computer science, electrical engineering, information systems management, mathematics, or physics and who receive a score in the range 31–39 on the MPE should take Mathematics 3, *Precalculus* and Mathematics 19A-B, *Calculus for Science, Engineering, and Mathematics* (two quarters) rather than Mathematics 11A-B, *Calculus with Applications* (two quarters).

## ACADEMIC ADVISING

Academic advising is available from Physical and Biological Sciences Undergraduate Affairs. Undergraduate Affairs publishes the web site [undergrad.pbsci.ucsc.edu](http://undergrad.pbsci.ucsc.edu), which contains detailed information about the degree programs, sample schedules, transferring credit, placement exams, faculty research, and opportunities in the Physical and Biological Sciences majors.

## FOR MORE INFORMATION

For further information about the mathematics major and upper-division course requirements, see:

[reg.ucsc.edu/catalog/html/programs\\_courses/mathPS.html](http://reg.ucsc.edu/catalog/html/programs_courses/mathPS.html)

Information about the mathematics major can be found at: [undergrad.pbsci.ucsc.edu/programs/math](http://undergrad.pbsci.ucsc.edu/programs/math) or by e-mailing [mathadvising@ucsc.edu](mailto:mathadvising@ucsc.edu).

For specific information regarding Mathematics faculty and research, please visit the department web site at: [www.math.ucsc.edu](http://www.math.ucsc.edu).

If you have other questions, contact:

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