

# M A T H E M A T I C A L S C I E N C E S

## PREPARATION FOR THE MAJOR

### High School Preparation

**Recommended as part of or in addition to UC's "a-g" admission requirements:**

**Four years of mathematics to include:**

**Two years of algebra,  
One year of geometry,  
One year of advanced mathematics with trigonometry.**

### Transfer Preparation

**To make normal progress in the major, complete the following courses prior to transfer:**

**One year of calculus,  
One year of advanced calculus (with differential equations and linear algebra),  
One course in mathematical proofs and logic,  
One course in computer programming,  
One course in basic physics with experience in mechanics.**

Please see the UCSB *General Catalog* ([www.catalog.ucsb.edu](http://www.catalog.ucsb.edu)) or your school counselor for more information on course preparation. California community college students should see [www.assist.org](http://www.assist.org).

The study of mathematics offers students access to virtually all disciplines of a liberal arts education. The study of the mathematical sciences combines the aesthetics of the applied arts with the practicality of science and technology. Students with a lively aesthetic sense will find mathematics to be a subject of austere yet compelling beauty whose scope is limited only by their imagination and ingenuity. Students interested in the natural and physical world will find mathematics to be an essential tool in the biological and physical sciences. Students drawn to the social and behavioral sciences will find mathematics to be an integral part of research in disciplines such as sociology and psychology. Students who are considering the business, law, or medical professions will find that mathematics teaches them to think clearly, logically, and creatively about ideas ranging from the abstract to the concrete.

## The Majors

Recognizing the variety of interests among students drawn to mathematics, UCSB's Department of Mathematics offers several degree options. These include a Bachelor of Arts (BA) and Bachelor of Science (BS) in Mathematics, a BS in Mathematical Sciences, a BA in Economics/Mathematics offered in conjunction with the Department of Economics, and the BS in Financial Mathematics and Statistics in conjunction with the Department of Statistics and Applied Probability. (Refer to the appropriate major sheet for more information on the BA and BS in these majors.)

A degree in Mathematical Sciences is for students interested in computational aspects of mathematics, systems analysis, and decisional sciences. The BS in Mathematical Sciences requires completion of rigorous upper-division course work that prepares students for graduate work in mathematics, law, and the sciences and for advanced training in business administration, management, and operations research. It also prepares students to pursue a California teaching credential.

## The Pre-Majors

Certain UCSB majors, including Mathematical Sciences, require that applicants be admitted to a pre-major. Students must fulfill specific course and grade-point average (GPA) requirements in order to advance from the pre-major (completed during the freshman and sophomore years) to the major (completed in the junior and senior years). Pre-major requirements include courses in calculus, advanced calculus with differential equations and linear algebra, computer programming, and physics. Students must complete all pre-major courses (with the exception of the computer programming and physics courses) with a minimum GPA of 2.5. Transfer equivalents to these pre-major courses will be applied to the subject requirement, but not the GPA requirement. Only that portion of the pre-major which is completed at the University of California will be applied to the pre-major GPA requirement.

## Preparing for the Pre-Majors

If you have not completed the recommended high school or transfer preparation you should contact the Department of Mathematics for academic counseling. The department offers a diagnostic test (ADT) which will assess your ability level and determine the beginning mathematics course for which you are prepared.

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Historically, women and students from underrepresented ethnic groups have been discouraged from studying the mathematical sciences. Consequently, these students have been denied access to scientific and technological fields. The Department of Mathematics is committed to encouraging and supporting such students' efforts to obtain the mathematical preparation needed to secure careers in science and technology. The department's undergraduate faculty and staff advisors are available to assist all students in planning appropriate programs of study.

### **Special Opportunities in Mathematical Sciences**

Special opportunities made available to UCSB's outstanding Mathematical Sciences majors include:

- Annual presentation of the Mochizuki Memorial and the Raymond L. Wilder awards to exceptional majors;
- Participation, in conjunction with the College of Creative Studies, in the Putnam Exam competition held annually throughout the U.S. and Canada;
- An honors program, which offers special courses and other privileges and leads to the award of Distinction in the Major at graduation;
- Colloquium lectures delivered by visiting scholars;
- Quarterly and summer internships for select students who desire experience working on applied problems at industrial, research, and educational organizations;
- The Daily Calendar, which informs students of current seminars, colloquia, and special events.

### **Careers in Mathematical Sciences**

Successful completion of a degree in Mathematical Sciences conveys to professional schools of business, law, and medicine, as well as to prospective employers, the student's ability to think systematically, logically, and imaginatively regarding a wide range of ideas, from the abstract to the concrete. Mathematical scientists are sought by industry and government for jobs in actuarial science, communications, computer science, market analysis, operations research, systems analysis, mathematical economics, and management. Competition for jobs in some of these areas is intense. However, program planning in conjunction with a Department of Mathematics faculty advisor can increase a student's competitiveness. For example, completing coursework in probability, statistics, and computing in addition to that required by the degree is especially valuable to students pursuing actuary or market analyst positions, as well as to those pursuing law.

Students interested in teaching and research at the university level should plan to complete the Ph.D. degree. Students interested in teaching at the community college level should pursue graduate work at least through the master's degree. Teaching at the high school (secondary) level requires a California Single Subject Teaching Credential. Students considering this option should discuss their plans with the credential advisor in UCSB's Graduate School of Education early in their academic careers.

For more information on UCSB's Mathematical Sciences majors, please call or write to:

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University of California, Santa Barbara  
Santa Barbara, CA 93106-3080  
805/893-2171  
e-mail: [ugrad@math.ucsb.edu](mailto:ugrad@math.ucsb.edu)  
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