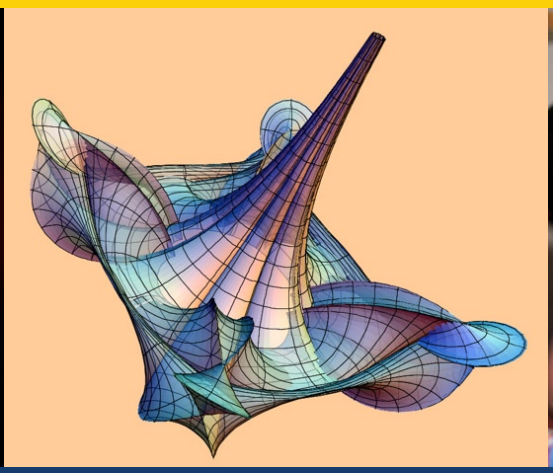
UCI School of Physical Sciences

Teaching • Research • Service

DEPARTMENT OF MATHEMATICS



School of Physical Sciences

Established in 1965, the UCI School of Physical Sciences rose to the top echelon of academia in a remarkably short time, and in 1995 became the first public university with two faculty to be awarded the Nobel Prize in two different fields. We offer top-rated educational and research opportunities for tomorrow's scientists, teachers, and technical professionals in the departments of Chemistry, Earth System Science, Mathematics, and Physics & Astronomy. Our world-renowned faculty members and research scientists teach and perform research with undergraduate and graduate students and postdoctoral fellows to explore the ever-advancing frontiers of knowledge.

Department of Mathematics

The power of mathematics can be felt in every discipline of science and engineering as well as in everyday life. The Department of Mathematics is committed to excellence in research and education.

The faculty of the Department of Mathematics are prominent scholars engaged in teaching, fundamental research in both pure and applied mathematics, and service to the local community with outreach efforts to foster success in STEM disciplines (science, technology, engineering, and mathematics). The faculty includes two members of the National Academy of Sciences, three fellows of the American Academy of Arts and Sciences, two SIAM fellows, eleven AMS Fellows, and thirteen former Sloan Research Fellows. Faculty conduct research in various fields of mathematics and its applications and have garnered numerous distinguished awards and national recognition for their excellent scholarly production.

B.S. in Mathematics

The Department of Mathematics is engaged in teaching and in fundamental research in a wide variety of basic mathematical disciplines. The curriculum in Mathematics includes opportunities for supervised individual study and research, and is augmented by seminars and colloquia.

The Department offers a B.S. degree in Mathematics. Within this program there are six tracks; besides the standard track, there are five specializations or concentrations.

Concentration in Mathematical Finance

Designed for students who would like to use their mathematical background to obtain a solid foundation in modern economics. This program prepares students for a wide variety of career options after graduation, including direct employment in the business world, entry into an MBA program, or advanced graduate education in either mathematics or economics.

Specialization in Applied and Computational Mathematics

Designed for students with an interest in mathematics applied to areas of science and engineering. Students completing this specialization will be prepared for a career in computing and/or engineering areas, as well as prepared for graduate programs in Applied Mathematics.

Specialization in Mathematical Biology

Designed for students with an interest in mathematics applied to biological systems. This specialization is designed to prepare students for careers involving mathematical and physical modeling for biological systems, as well as prepare for graduate work in mathematical and systems biology.

Specialization in Mathematics for Education

Designed for students with an interest in education. Curriculum focuses on courses that are especially useful for prospective Mathematics teachers.

Concentration in Mathematics for Education/ Secondary Teaching Certification

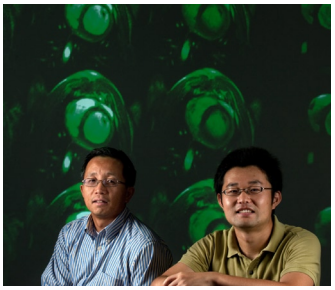
Designed for students in Mathematics to earn a bachelor's degree and to complete the required coursework and field experience for the California Preliminary Single Subject Teaching Credential at the same time. This is a 4-year program also called the Cal Teach Science & Mathematics Program.

Research Opportunities

Mathematicians are frequently asked, "How can you do research in math? Hasn't it all been done before?" The answer is no, there is still much to be discovered; in fact, 50,000 mathematics research papers are published each year. The rapid growth in scientific and technological areas that rely on mathematical techniques has led to a dramatic growth in the number and kind of real-world problems confronting the mathematicians of the twenty-first century.

In recognition of these new areas and the need for specifically trained mathematicians, the Department offers several program options for Mathematics majors. MCBU (Mathematical and Computational Biology for Undergraduates) is an NSF-funded program for training and research for students interested in mathematics and biology.

Other major areas of research include:
- Algebra and Number Theory
- Analysis and Partial Differential Equations
- Applied & Computational Mathematics
- Ergodic Theory and Dynamical Systems
- Geometry and Topology
- Inverse Problems and Imaging
- Logic and Foundations
- Mathematical and Computational Biology
- Mathematical Physics
- Mathematical Visualization
- Mathematics of Complex Social Phenomena
- Probability



Cryptography

When you send your credit card information over the internet, cryptography ensures that no one can steal the number while it's in transit. Cryptography dates back thousands of years. Julius Caesar used cryptography to protect and send secret messages of military significance. The movie "The Da Vinci Code" has its plot centered around cryptography and understanding secret codes. More recently, cryptography is used in electronic voting, and a mechanism used to sign documents electronically. The Mathematics Department offers courses in this specialized area, along with research opportunities.

Honors Program in Mathematics

The Honors Program in Mathematics is designed for students contemplating graduate work in mathematics. The program is open to junior and senior Mathematics majors who meet the minimum academic qualifications of a 3.5 GPA in Mathematics courses and a 3.2 GPA overall. Students will complete a series of honors level courses and honors seminars. If all requirements are completed and the student's work and final GPA satisfies the program restrictions, the student will graduate with Honors in Mathematics, and this distinction is noted on their transcript.

Program of Study

For all Mathematics majors, assistance in planning a program of study is available from the Mathematics Department Undergraduate Advisor and the advisors for the various tracks, as well as from the Academic Counselors in the School of Physical Sciences. The following is a sample plan of courses for Mathematics majors.

1st Year	Calculus, General Chemistry/Physics, Writing, General Education
2nd Year	Linear Algebra, Differential Equations, Abstract Math, General Education
3rd Year	Math Analysis, Probability, Spec./Conc. courses, General Education
4th Year	Abstract Algebra, Spec./Conc. courses, General Education

More detailed plans can be found in the UCI Catalogue.

Pi Mu Epsilon

Pi Mu Epsilon is a national mathematics honorary society into which a few select graduating Mathematics students are invited. It is dedicated to the promotion of mathematics and recognition of students who successfully pursue mathematical understanding. Interested members should complete at least three quarters of calculus and two additional courses in mathematics at or above the calculus level, and students must have maintained a grade point average of 3.0 in courses for their undergraduate degree.

Community Outreach

The Mathematics Department participates in many annual outreach events in the community to motivate a new generation of future scientists, engineers, and mathematicians. Such outreach includes: California State Summer School for Math & Science (COSMOS), MathCounts regional and state competition, and Math Community Education Outreach (Math CEO). These are a few of the many outreach activities that serve the various communities in and around Orange and Los Angeles counties.

Undergraduate Mentoring Program

The Physical Sciences Undergraduate Mentoring Program is an initiative by the School of Physical Sciences to help undergraduate students succeed both professionally and academically. Students will have the opportunity to meet and converse with professionals from various career paths. The goal is to expose students to career and networking opportunities. Mentors coach students in career and academic decisions.

Photos Courtesy UCI Communications

Additional Information

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