College of Natural Sciences & Mathematics

Marie Johnson, Dean

Mission. The College of Natural Sciences & Mathematics is dedicated to the principles that teaching and research are intricately mixed and undergraduate research is an integral part of education. By combining quality classroom instruction, student involvement in research, and strong academic advising, we transform the student experience.

A COMMITMENT TO EXCELLENCE

- Student-centered faculty are recognized for their outstanding teaching and cutting-edge research.
- Well-equipped, state-of-the-art laboratories and classrooms support student learning.
- Highly regarded degree programs provide meaningful career opportunities in essential areas of need.

Key Points. The College of Natural Sciences and Mathematics (CNSM) is one of eight Colleges on the campus of Cal State Fullerton. Where given, numbers are for Fall 2016.

- Approximately 2,906 students are enrolled in undergraduate and graduate programs.
- Our students are 58% female and 42% male.
- The ethnic distribution of our student body is 0.1% American Indian, 1.9% Black, 26.3% Asian/Pacific Islander, 41.4% Hispanic, 18.4% White, 4.0% Unknown, 3.9% Multi-race, and 4.0% International.
- A total of 391 undergraduate students and 63 graduate students received degrees in 2015-2016.
- CNSM has 67 tenured professors, 42 tenure-track professors, and 14 full-time lecturers.
- CNSM offers eight undergraduate and eight graduate degree programs.
- CNSM offers a minor in Natural Sciences and the Departments offer seven discipline specific minors.
- Discipline-based education researchers are embedded in each department. These researchers study how students learn and disseminate this information so our classrooms employ the most advanced teaching techniques known.
- CNSM offers single subject credentialing for future K-12 teachers and provides future teachers advanced coursework in science curricula, research and seminar opportunities, and enables teachers to increase proficiency in science disciplines appropriate to their academic teaching assignments.
- CNSM supports student retention and engagement with a robust program of student success initiatives.

Organizational Structure. The College of Natural Sciences and Mathematics is comprised of five departments.

- The Department of Biological Science is dedicated to educating the individual student using active-learning, inquiry-based educational approaches. Our program is distinctive in the region in the number of excellent opportunities available for faculty-mentored undergraduate research. Our mission is to guide students to acquire skills, develop attitudes, and master the information necessary to continue their education, obtain desirable employment in biology-related careers, and be productive citizens.
  Degrees offered: BS Biology, MS Biology, Master of Biotechnology, Biotechnology Minor, Cell and Molecular Biology Minor, Ecological and Evolutionary Biology Minor

- The Department of Chemistry and Biochemistry provides thorough and innovative instruction in the theory and practice of chemistry and biochemistry for students who will advance to graduate work, teaching careers, health professions, and positions in industry and government. From basic lectures and laboratories to specialized courses, our students are exposed to a wide and interdisciplinary knowledge base. Students also engage in capstone independent research projects with faculty mentors.
  Degrees offered: BS Chemistry, BS Biochemistry, BA Chemistry, MA Chemistry, MS Chemistry, Chemistry Minor

- The Department of Geological Sciences is one of the largest undergraduate geoscience programs in the state, and provides a field intensive, research-based curriculum that educates students to be effective citizen-scientists. Our students are well-prepared for employment in industry or government; teaching at the elementary, high school and community college level; and further graduate studies in the geological sciences.
  Degrees offered: BS Geology, BA Earth Sciences, MS Geology, Geology Minor

- The Department of Mathematics offers programs with sufficient breadth and depth in the study of mathematics to prepare students for subsequent graduate study or employment in mathematics or related areas.
  Degrees offered: BA Mathematics, MA Mathematics, MS Mathematics, Minor Mathematics

- The Department of Physics takes pride in mentoring students towards career paths in our classrooms and our research labs. Physics teaches a wide range of scientific skills and technologies while developing solid critical-thinking tools that bridge industries, such as engineering, electronics, communication, defense, and life sciences. Faculty work hard helping our students develop resumes and statements of purpose and writing personalized letters of recommendation.
  Degrees offered: BS Physics, MS Physics, Minor Physics
**College Centers.** The College houses seven centers in support of the mission.

- **Center for Computational and Applied Mathematics (CCAM)**
  CCAM encourages and facilitates research, education, and outreach in computational mathematics and science through interdisciplinary collaborations of faculty, students, and external partners. Goals include attracting and bringing together faculty, students, and other researchers with related interests; providing research training to the next generation of students in an interdisciplinary environment; developing interdisciplinary research and educational products; positioning members to generate external funding unique to the Center’s mission; and engaging in outreach and community building.

- **Center for Applied Biotechnology Studies (CABS)**
  The mission of CABS is to provide research, educational, and consulting opportunities and services to the local and state biotechnology/biomedical communities through its applied research programs and workforce-oriented curriculum. CABS’ facilities support CSUF faculty in publication development and pursuit of CSU, intramural and external funding opportunities.

- **Catalyst**
  The Catalyst Center for the Advancement of Research in Teaching and Learning Math and Science brings together science and math education experts across two colleges (CNSM and College of Education) and seven departments to advance research and pursue external grant opportunities in teaching and learning across the entire spectrum of math and science education, from preschool through graduate education and including informal education.

- **John D. Cooper Archaeological & Paleontological Center**
  The Cooper Center is jointly run with CNSM and the College of Humanities and Social Sciences. The center manages, curates, preserves, and exhibits fossils and artifacts collected by Orange County during construction activity. The collection illuminates Orange County’s rich history, including evidence of a sophisticated people who occupied western North America as early as 13,000 years ago, and animal life from the distant past. Its activities have led to the award of external grants and publications.

- **Desert Studies Center (DSC)**
  DSC is a field station of the CSU located among a haven of natural ponds, dry lakes, and foothills in the Mojave National Preserve east of Barstow. DSC is governed by a consortium of 7 CSU campuses and is managed by CNSM. It provides opportunity for individuals and groups to conduct research, receive instruction, and experience the desert.

- **Tucker Wildlife Sanctuary (TWS)**
  TWS is a 12-acre non-profit nature preserve, located in the heart of Modjeska Canyon adjacent to the Cleveland National Forest. It is owned by CSUF’s Auxiliary Service Corporation and operated by CNSM. In addition to serving as a research center for students, faculty and others, Tucker is open to the public to enjoy and learn about the local wildlife and natural habitat in the Southern California canyon area.

- **Gravitational-Wave Physics and Astronomy Center (GW PAC)**
  GWPAC conducts research, education, and outreach in gravitational-wave astronomy, physics, and astrophysics. Gravitational waves provide new information about Nature’s most violent astrophysical events, such as supernovae and collisions between black holes or neutron stars. GWPAC scientists model sources of gravitational-waves, analyze the gravitational-wave signals they produce, measure signals in the LIGO detectors, and improve detector sensitivity. The Center faculty members are prolific publishers and bring in significant externally funded grants.

**Outside Funding.** Faculty members were awarded nearly $5.5 million per annum in grants and contracts for research and scholarly activities in 2015-2016. 60 proposals are pending.

Funded programs supporting undergraduate students:

- **Howard Hughes Medical Institute (HHMI) Scholars Program** — $1.2 million from HHMI to train undergraduates in biomedically-related research and to provide research exposure to community college and high school teachers and students.

- **Maximizing Access to Research Careers (MARC) Scholars Program** — $1.8 million from NIH to increase the number of disadvantaged and URM undergraduates who enter and succeed in biomedically-related PhD programs.

- **Minority Health & Health Disparities International Research Training Program (MHIRT)** — $1.2 million from NIH to increase the numbers of students belonging to health disparities populations or URM that pursue advanced degrees in basic sciences, biomedical or clinical research fields and open opportunities for international collaborations.

- **Southern California Ecosystems Research Preparation Scholars Program (SCERP)** — $615,000 from NSF to provide research opportunities, travel funding, and career planning for students interested in ecology and environmental biology.

- **California Institute for Regenerative Medicine (CIRM) Bridges to Stem Cell Research Scholars Program** — $1.3 million from CIRM to train students to become stem cell biology researchers and to enter careers in stem cell-oriented companies.

- **Louis Stokes Alliance for Minority Participation (LSAMP)** — $49,994 from NSF to increase the number of targeted students who have faced or face social, educational, or economic barriers to graduate with degrees in the sciences, technology, engineering, or math (STEM).

- **Regional Alliance in STEM Education: Raising the Bar in Transfer, Retention and Graduation Rates (Project RAISE)** — $5.8 million from US Department of Education for a project partnering with eight regional community colleges to increase the number of Hispanic and low-income transfer students who complete bachelor’s degrees in STEM and enter these fields.

- **NSF INCLUDES (STEM)**
  - Scaling (STEM)$^2$ — $300,000 from the National Science Foundation for a two-year pilot project to scale up an ending program that provides a pathway for underrepresented community and low income college students to earn bachelor’s degrees in science, technology, engineering, and mathematics (STEM) fields at a four-year university.

- **Scholarships to Enhance Excellence in the Chemical and Biological Research-Based Workforce (STEER)** — $617K from NSF to enhance the quantity and quality of undergraduates joining the biological and chemical research-based workforce.

Funded programs supporting future teachers:

- **Fullerton Mathematics Teacher and Master Teacher Fellows Project** — $2.53 million from NSF to develop mathematics teachers and mathematics teacher leaders to serve as master/student teachers and college/university liaisons in high-need districts in the greater Orange County area.

- **Advancing Teachers of Mathematics to Advance Learning for All** — $3 million from NSF to strengthen teaching and learning of mathematics in underserved Orange County middle schools and high schools.