

UCSC Applied Mathematics Department Application for Approval

EXECUTIVE SUMMARY

Request to Review Application

We have received an application to approve a new department, which we are submitting for approval to the ARCS NCC board: The Applied Mathematics Department at the University of California at Santa Cruz. The application is separately attached, but a brief summary follows:

Background

The Applied Mathematics Department of the Baskin School of Engineering at UC Santa Cruz was established in July 2018 as a result of the split of the former Department of Applied Mathematics and Statistics into two separate departments. Applied Mathematics is a field of research specialized in the application of analytical and numerical tools and techniques towards the solution of complex quantitative problems in science and engineering. Since it is domiciled in the Department of Engineering, a unique feature of this department is its strong focus on applications. The faculty collaborate regularly with other faculty both within and outside of UCSC, in such fields as Cyberphysical Systems, Control & Robotics, Bioinformatics & Genomics, Astrophysics, Physics, Physical Oceanography and Planetary Science. Although the young department is not yet nationally ranked, College Factual has ranked the department as #9 for Best Applied Mathematics Doctoral program in the Far Western region of the United States and #8 in California. US News and World Report ranks the Baskin School of Engineering among the top 100 graduate programs in engineering.

Rationale in favor of application

- Distinguished Faculty – The 9 full-time ladder rank faculty in the department all hold at least one research grant from nationally-recognized scientific bodies, such as NSF, NIH, NASA, DARPA, DOE, DOD and others, and have published 20 papers thus far in 2022 in top peer-reviewed journals.
- Applied Mathematics is currently a defined “Area of Study” approved by ARCS for Ph.D. students.
- USCS Overall rankings:
 - For 2022-23, US News ranked USCS as follows:
 - #7 for excellence in undergraduate teaching among National Universities
 - #18 for social mobility, among National Universities
 - #35 Top Public Schools among national Universities
 - #83 overall in National Universities
 - In 2022, Princeton Review named UC Santa Cruz
 - #2 public university in the nation for “making an impact”
 - #3 greenest college in the nation
- Students – There are currently 22 students in the PhD program (expected to increase substantially in the next two years), 4 MS students in Applied Mathematics; 16 MS students in Scientific Computing and Applied Mathematics, and 70 declared undergraduates. Approximately 50% of graduates join private industry and approximately 50% enter academia or national laboratories.

- Mentoring – Students receive significant mentoring in research/academic progress, teaching, professional development, and well-being, plus several career-oriented workshops.
- Faculty-Student ratio – Between 2018 and 2022, the average number of PhD students per faculty was 2.8. On average, students take 5.25 years to complete their PhD.
- Vision for the Future: The department is rapidly expanding, with the recent launch of the MS in Scientific Computing and Applied Mathematics and the even newer BS in Applied Mathematics attracting even more students than anticipated. Accordingly, more faculty hires are planned. The next hire will be in high-performance computing (finite elements), with additional hires planned in data science/machine learning, fluids, control, mathematical biology and stochastic modeling.
- The goal is to keep the department at the cutting edge of applied mathematical research and within the next 10 years to establish the department as a strong, internationally recognized department.