

## **Joint Ph.D. Program in Computation Science with San Diego State University**

### **Mission:**

The mission of the Computational Science doctoral program is to train graduates that can use, advance and create new computational tools and models for understanding natural phenomena and to use such knowledge to engineer solutions that can address relevant problems in science, engineering and other related areas. The program aims to provide students with training and research experiences that will provide them with the knowledge, skills and expertise necessary to use computational models and tools in advancing knowledge in science and/or engineering.

### **Program Learning Outcomes (PLOs):**

The graduates of the Computational Science doctoral degree program must be able to

1. Describe and formulate a problem statement that requires computational tools to solve
2. Compare, critically evaluate and choose from existing computational approaches or models, or develop new computational approaches or models for solving problems in physical, biological or engineering systems
3. Formulate solutions within the limitations of available computational resources and data to develop and validate computational models
4. Synthesize and assimilate data for improving the accuracy of computational models and the performance of computational methods
5. Assess the accuracy, robustness and efficiency of numerical approaches and algorithms
6. Use existing software and computational tools to conduct research and advance knowledge in an area of inquiry, and develop new tools as necessary that can be used, modified and advanced by others
7. Document and communicate (orally and in writing) computational research and results to varied audiences and users
8. Acquire, follow, and implement best practices in generating, handling, and analyzing data; develop the ability to critically question the design of algorithms and their purposes; abide by and promote scientific integrity and accountability

### **Assessment:**

Students are assessed through the following means:

1. Research Report Exam
2. Dissertation Proposal Exam
3. Dissertation Defense
4. Publication of Peer-Reviewed Articles
5. Institutional Data (Time-to-Degree, Graduation Rates)
6. Employment Placement Rates
7. Student Surveys
8. Alumni Surveys

**Process:**

We are a new program, and we had our first (and only) graduate last year, and we are beginning to collect assessment data now. Data will be collected annually during the summer months, and provided to the executive committees at both institutions (UCI and SDSU) in the fall of each year. The executive committees will meet to review the data, and discuss any modifications to the program necessary to improve student success in achieving the PLOs. Any proposals approved by one committee will be forwarded to the other for their approval as well before they are instituted into the policies, procedures or bylaws of the program. In instances where the voting is split between the committees, the directors at both universities together with a subset of representatives from the two executive committees will meet to resolve the issue.