University of California, Santa Barbara
Program Learning Outcomes

PhD in Mechanical Engineering

Upon graduation with a PhD in Mechanical Engineering:

Core Knowledge

- Students will be able to demonstrate a broad knowledge in the field of Mechanical Engineering with specific command of at least two general areas including (i) computational science and engineering, (ii) dynamical systems, control and robotics, (iii) fluid mechanics and thermal sciences, (iv) micro- and nanoscale engineering and (v) solid mechanics, structures, and materials engineering.
- Students will be able to demonstrate a deep understanding and expertise in one or more areas of Mechanical Engineering specialization.

Research Methods and Analysis

- Students will be able to develop and demonstrate through their research projects a strong theoretical and/or experimental and/or computational background.
- Students will be capable of discussing and applying an understanding of the current literature in mechanical engineering and related disciplines.
- Students will be able to identify fundamental research problems and propose innovative solutions to these problems.
- Students will be able to organize results into a coherent thesis.

Pedagogy

- Students will possess classroom management skills, techniques for effective lecturing, and methods for guiding and assessing undergraduate students.
- Students will develop the ability to communicate technical material to audiences ranging from general to specialized.
- Students will be able to present their research effectively through oral and written presentations and through the development of supporting materials.

Scholarly Communication

- Students will be able to create effective written technical arguments that contribute to the understanding of the field by their peers.
- Students will be able to review and synthesize relevant literature.

Continued on Page 2

- Students will write in a level and style of English consistent with that found in leading academic conferences and journals.
- Students will understand and properly use citations and references to make their technical arguments and justify critical assumptions.
- Students will be able to present and defend their findings at conferences and seminars.

Professionalism

- Students will understand the importance of contributing technical advances to their scientific communities.
- Students will be familiar and participant with the relevant professional societies.
- Students will understand and be able to identify their career options post-graduation, both industrial and academic.
- Students will demonstrate a commitment to the thoughtful consideration of fundamental principles of ethical professional conduct.

Independent Research

- Students will develop their own research projects that meet high standards in theory and/or experiment and/or computation.
- Students will present a compelling research proposal, stating key problems in the field, and proposing well thought-out solutions.
- Students will carry out the proposed research, develop new knowledge and propose novel solutions.
- Students will produce scholarship that will be published as articles and/or books and/or conference papers that appear in leading peer reviewed venues in the field of Mechanical Engineering.