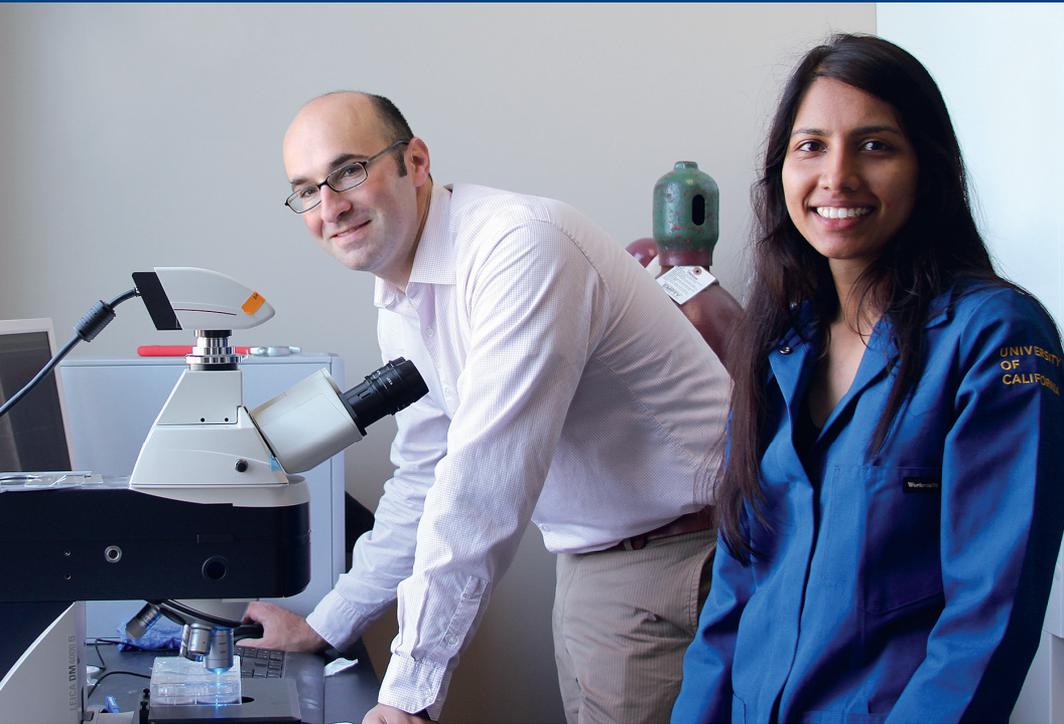


GRADUATE PROGRAM Materials Science and Engineering

<http://engineering.uci.edu/dept/mse/graduate>



Materials science and engineering focuses on the discovery of new materials, the tailoring of materials systems for optimum performance in a given technological application, and the design of novel materials solutions for emerging technologies. MSE is an interdisciplinary field incorporating elements of chemistry, physics, biology and/or engineering to derive and control the connections between structure (at length scales ranging from sub-atomic to macroscale), the processing necessary to achieve that structure, the fundamental properties (electrical, optical, thermal, mechanical, etc.), and the performance.

These correlations are investigated using advanced materials characterization techniques and theoretical/computational analysis. Many of the most pressing scientific and technological challenges faced by humanity are constrained by the limits of currently available materials. The discovery, design and development of enabling materials are at the core of solving current and future scientific and engineering grand challenges, and benefit industries involved in electronics, advanced sensors, communications, human health, transportation, manufacturing recreation, energy conversion and storage, and environmental sustainability.

HIGHLIGHTS

- Cross-disciplinary research in energy, sustainability and biomaterials
- Cohesive graduate student community with a proactive departmental Graduate Student Association
- Internationally renowned researchers leading the Irvine Materials Research Institute with state-of-the-art instrumentation for TEM (4), SEM/FIB (5), and XRD (3)

RESEARCH FOCUS AREAS

- Materials for Energy Conversion and Storage
- Materials for Extreme Environments
- In-situ Microscopy
- Nanomaterials
- Materials Processing and Additive Manufacturing
- Bio-inspired Materials
- Optoelectronic Materials
- High Entropy Materials
- Micro/Nano-Architected Materials
- Nanomechanics
- Coatings and Engineered Surfaces
- Green Engineering
- Computational Materials Science
- Non-destructive Testing
- Scalable Micro/Nano-Manufacturing

DEGREES OFFERED

M.S. & Ph.D.

AFFILIATED FACILITIES

- Irvine Materials Research Institute
- Institute for Design and Manufacturing Innovation
- Integrated Nanosystems Research Facility
- Advanced Power and Energy Program
- National Fuel Cell Research Center
- Laser Spectroscopy Facility and Mass Spectrometry Facility
- Laboratory for Fluorescence Dynamics
- Nuclear Reactor Facility

RECOMMENDED BACKGROUND

Given the nature of materials science and engineering as a cross-disciplinary program, students with a background and suitable training in materials, engineering (mechanical, electrical, civil, chemical, aerospace) and the physical sciences (physics, chemistry, geology) are encouraged to participate. A student with an insufficient background may be required to take remedial undergraduate courses. Recommended background courses include an introduction to materials, thermodynamics, mechanical behavior and electrical/optical/magnetic behavior.