

# Erik Jonsson School of Engineering and Computer Science

Doctor of Philosophy in Materials Science and Engineering



## Curriculum

Materials science and engineering is a highly interdisciplinary field drawing on many fundamental disciplines to advance the design and discovery of new materials for use in virtually all areas of science, engineering, industry and society. The PhD in Materials Science and Engineering program prepares individuals to perform original, cutting-edge research in areas including nanostructured materials, advanced semiconductor materials, electronic, optical and magnetic materials, biomimetic materials, polymeric materials, MEMS materials and systems, organic electronics, theory and simulation of materials systems, and advanced processing of modern materials.



The PhD program prepares students for professional and research careers in industry, government or academia. Students develop the expertise to make independent contributions to research and development, formulate novel problems, develop creative solutions to novel and existing problems, and serve as system architects and leaders of design teams. Students successful in this program have come from undergraduate and/or MS-level study in the areas of materials science, mechanical engineering, electrical engineering, chemical engineering, chemistry and physics.

The curriculum ensures that students develop a broad knowledge of modern materials science; that they apply their knowledge and analytical skills to create effective and novel solutions to practical problems; and that they communicate well in professional forums and publications; and that they work effectively in both collaborative and independent settings.

## Career Options

Graduates of the program seek positions such as: Materials Engineer/Scientist, Process Engineer, Research Engineer, Manufacturing Engineer and postdoctoral or professor positions at universities.

## Degree Program

The PhD in Materials Science and Engineering requires 75 semester credit hours minimum beyond the baccalaureate degree, and involves both coursework and intensive research. Each doctoral student must carry out original research in materials science and engineering under the direction of a member of the materials science and engineering faculty, and complete and defend a dissertation on the research project. Coursework requirements are divided into core subjects, advanced topics and electives. The core subjects studied are *quantum mechanics for materials scientists*, *thermodynamics of materials*, *materials characterization and electronic optical and magnetic materials*. Advanced and elective coursework is selected from a wide variety of courses in the broad areas of (i) materials properties and processing, (ii) further study of materials characterization methods, (iii) theoretical and computational methods for studying materials, and (iv) semiconductor materials and devices. Nanomaterials and nanoscience feature prominently in many of these courses.

For complete admission and degree requirements, view the Graduate Catalog at [catalog.utdallas.edu](http://catalog.utdallas.edu).

## Contact Information

### MSE Admissions

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[engineering.utdallas.edu](http://engineering.utdallas.edu)