# MATERIALS SCIENCE (MS, PHD)

*Jointly offered by the College of Agriculture, Health, and Natural Resources, College of Liberal Arts and Sciences, College of Engineering, School of Pharmacy, and UConn Health.*

The Institute of Materials Science offers programs leading to Master of Science (M.S.) and Doctor of Philosophy (Ph.D.) degrees in the area of Material Science. All programs include training in synthesis, characterization, and applications of materials, and give students sufficient flexibility to pursue their special interests as well as time to take courses in other departments at the University of Connecticut.

## Master of Science in Materials Science

The program normally requires 30 credits. While it is possible to complete the M.S. degree within a year, most students will need three to four semesters. The courses of the program cover synthesis, characterization, and applications of materials. The plan of study for the M.S. degree may be formulated with related work in almost any area, e.g., Biology, Chemistry, Physics, Economics, Business, Biomedical Engineering, Chemical Engineering, Mechanical Engineering, Civil Engineering, Electrical engineering, and Materials Science and Engineering. Students are encouraged to participate in research projects done by members of the department.

## Ph.D. Program

Emphasizes development of the ability to generate novel research results in Materials Science. Individuals with a Bachelor's degree in any major, with an interest in Materials Science are encouraged to apply. The course work typically consists of a minimum of 30 credits that cover a wide range of topics, including Biology, Chemistry, Physics, Economics, Business, Biomedical Engineering, Chemical Engineering, Mechanical Engineering, Civil Engineering, Electrical Engineering, and Materials Science and Engineering. After completing the necessary course work and a sequence of examinations, a Ph.D. candidate must complete a dissertation that makes an original contribution to the field of Materials Science.

## Master of Science in Materials Science Requirements

There are no specific required courses. All students must choose a committee for the M.S. degree and that committee must approve all courses. Typical courses are any of the 5000-level courses in Biology, Chemistry, Physics, Economics, Business, Biomedical Engineering, Chemical Engineering, Mechanical Engineering, Civil Engineering, Electrical Engineering, and Materials Science and Engineering. The final requirement is passing the Master's Exam which has two parts. One is a written test concerning basic understanding of course materials. The second requirement is a final oral exam which includes course work, and any research done by the student. For a course work master's degree there is no thesis requirement. For a research based Master's degree, there is a requirement of a Master's thesis. All students are encouraged to follow the research degree route.

In order to be considered for a possible switch to the Ph.D. program or for financial support, a student with an M.S. degree in Materials Science or someone showing great promise during the M.S. program needs to apply to the Ph.D. Program.

## Ph.D. Program Requirements

The Ph.D. in Materials Science requires a minimum of 30 credits of content coursework beyond the baccalaureate or at least 15 credits of content coursework beyond the master's degree. An individual plan of study is developed by the student and their Advisory Committee. Courses in the following departments are considered: Biology, Chemistry, Physics, Economics, Business, Biomedical Engineering, Chemical Engineering, Mechanical Engineering, Civil Engineering, Electrical Engineering, and Materials Science and Engineering.

In general, Ph.D. students must take graduate level courses that are approved by the major advisor of a student, as well as the student's advisory committee. The materials science program has no requirement on foreign languages.

The first formal requirement for the Ph.D. degree is passing the General Examination. The general examination consists of a written exam that is an original proposal. If the student passes the written exam, they are then asked to prepare for an oral examination. The oral exam consists of any aspect of course work, the written exam, the proposal, research progress, or combinations of these. The preparation of a dissertation then follows, where the student must present an original contribution to the general area of Material Science. The final requirement is a defense of the Ph.D. dissertation before the Ph.D. Advisory Committee, students and anyone else interested in attending. The exam consists of a presentation by the student, questions of the students and audience, and then a closed session of questions from the Advisory Committee.