MTSCEG:MS - Master of Science in Materials Science and Engineering

Overview

Degree Offered
MS - Master of Science

Program Title
Materials Science and Engineering

The Master of Science (MS) degree in Materials Science and Engineering aims to enhance students understanding of the Materials Science field that is very dynamic and is constantly adapted to address industry's needs. Advanced materials are the foundation of manufactured products and many of the technological advances of this century were enabled by the development of new materials. The program offers specialization in metallurgy, ceramics, electronic materials, nanomaterials, and biomaterials. There is an increasing demand for graduates in materials science and engineering, with high technology industries leading the need for graduates. In fact, many of the companies needing materials scientists and engineers did not exist 20 years ago. Because everything is made of materials and new materials, such as nanomaterials, are rapidly being developed, materials science and engineering is a growth field in engineering. This program provides an opportunity for students to enhance their technical knowledge and to conduct research that can aid in their professional development.

For more information, visit the College of Engineering and Computing website.

To explore more about this program, visit the website below:
Program Website

Academic Group
College of Engineering and Computing

Diploma Title
Master of Science in Materials Science and Engineering

Total Credits
30

CIP Code
14.1801

Requirements

Simple Requisites

Subplan

No Requirement Level

Areas of Specialization

--Metals and Alloys

--Electronic Materials

--Ceramics

--Polymers and Biomaterials

--Nanomaterials

Degree Program Credit Hours: 30
Type

Completion Requirement

Required Courses

Fulfill ALL of the following requirements:

Common Core Courses:

All MSMSE degree seeking students must take the following three courses or equivalent plus one seminar as common core courses:

Complete ALL of the following Courses:

- EMA5106 - Thermodynamics and Kinetics of Materials
- EMA5001 - Physical Properties of Materials
- EMA5507C - Analytical Techniques of Materials Science
- EML6935 - Graduate Seminar

The remainder of the courses shall be chosen from the electives with consultation of the student's advisor. Additionally, up to six hours may be taken from courses offered by other departments.

AND

MSMSE Elective Courses

Complete ANY of the following Courses:

- EGM5354 - Finite Element Method Applications in Mechanical Engineering
- EGM6355 - Nonlinear Finite Element Analysis
- EGM6570 - Fracture Mechanics
- EML5103 - Intermediate Thermodynamics
- EML5509 - Optimization Algorithms
- EML5562 - Advanced Electronic Packaging (Inactive)
- EMA5140 - Introduction to Ceramic Materials
- EMA5295 - Principles of Composite Materials
- EMA5200 - Nanomechanics and Nanotribology
- EMA5015 - Introduction to Nanomaterials Engineering
- EMA5104 - Advanced Mechanical Properties of Materials
- EMA5016 - Nanoelectronic Materials
- EMA5017 - Nanoparticle Technology
- EMA5018 - Nanoscale Modeling of Materials
- BME5105 - Biomaterial Science
- EMA5646 - Ceramic Processing
- EMA5605 - Fundamentals of Materials Processing
- EMA6516 - Crystallography and X-ray Diffraction
- EMA6518 - Transmission Electron Microscopy
- EMA6665 - Polymer Processing and Engineering
- EMA6264 - Mechanical Properties of Polymers
- EMA6165C - Polymer Physics and Analytical Techniques
- EEE6399C - Electronic Prop Mat
- EEE6315 - Advanced Solid-State Electronics

- EEE6332 - Thin Film Engineering
- GLY5287C - Scanning Electron Microscopy with EDS Analysis
- PHZ5405 - Solid State Physics
- PHZ6437C - Surface Physics
- PHZ6426 - Advanced Solid State Physics

AND

Independent Studies

Non-thesis students *must* enroll in 3 credits to complete their project; a maximum of 6 credits of EML6908 Ind Studies may be taken.

Thesis students may take a maximum of 3 credits.

Complete up to 2 course(s) and earn up to 6 credit(s) from the following:

- EML6908 - Independent Studies

Additional Comments:

Additional Degree Requirements

The Department of Mechanical and Materials Engineering offers both thesis and non-thesis options for the Master's Degree. A student seeking the Master's degree with or without thesis is required to pass a comprehensive oral or written examination.

All work counted for the Master's degree must be completed during the six years immediately following the date of admission.

Thesis Option

A student shall complete a minimum of 24 semester credit hours of course work, plus a minimum of 6 semester credit hours of EML6971 Masters Thesis, Master's Thesis, and MME Graduate Seminar.

A maximum of 6 credit hours of courses offered by other departments may be included among the 24 course hour minimum. A maximum of three credit hours of approved independent studies, EML6908 Ind Studies, may be counted toward the M.S. thesis degree. A maximum of six graduate credit hours can be transferred from other accredited institutions provided that the courses have not been used for another degree and have a minimum letter grade of 'B'. Transfer courses must be approved by the advisor and Graduate Coordinator. Early in the program (before the end of the second term) the student and advisor will complete a study plan that specifies the courses that will comprise the program.

When the thesis research is completed, the student should schedule a defense with an examining committee appointed through the University Graduate School consisting of a least three graduate faculty members (at least two of whom should be from the department). The thesis, with an approval cover letter from the advisor,

should be given to the examining committee for review not less than four weeks before the scheduled defense. The candidate should prepare to summarize the thesis in the manner of a technical paper using appropriate visual aids in 40 minutes or less.

Following the presentation, the candidate will answer questions related to the work from the audience and/or the committee. At the conclusion of the defense, the committee will agree on the outcome -pass or fail- and report the results to the Graduate School. Following the exam the student will implement the committee's suggestions for improving the draft document. Each committee member must sign the approval form in the final document. Hardcover bound copies of the approved thesis must be provided to the advisor and the department. Students should become familiar with the University Graduate School's regulations and deadlines available on line at http://gradschool.fiu.edu.

Non-Thesis Option

A student shall complete a minimum of 30 semester credit hours of graduate course work, and one semester of Graduate Seminar. Non-thesis students are required to do a three-credit project under the independent study course registration. Up to nine credit hours of graduate course work from other departments may be included among the minimum of 30 credits. A maximum of six graduate credits from other accredited graduate programs completed with a 'B' or better and not counted toward a previous degree may be included in the study plan. The advisor and the Graduate Coordinator must approve transfer courses if they are to be included in a study plan. A maximum of three credits of independent study beyond an independent project may be included in a study plan.

Non-thesis students are required to submit a formal report and presentation of the project, with the report and presentation evaluated by an examining committee that will include a minimum of three faculty members, at least two of whom should be from the department.

Graduation Requirements

The degree will be conferred when the following conditions have been met:

(1) Recommendation of the advisor and faculty of the Department.

(2) Certification provided by the Department Chair, College Dean, and University Graduate School that all degree requirements have been met.

(3) Completed the three department core course requirements plus the elective courses in the student's major area.

(4) Completed undergraduate course deficiencies specified at admission, if any, with no grades below 'C' and a GPA ≥ 3.0.

(5) Thesis option: Successfully completed a minimum of 30 semester hours of graduate course work as specified in an approved study plan containing at least 6 hours of 6000 level courses with a GPA ≥ 3.0 (the minimum successful grade is a 'C'; not more than six semester hours transferred from another accredited graduate program that was not part of a previously awarded degree may be incorporated in the study plan) plus a minimum of six hours of masters thesis.

(6) Non-thesis option: Successfully completed a minimum of 27 semester hours of graduate course work as specified in an approved study plan containing at least 9 hours of 6000 level courses and a 3 credit hour project with a GPA ≥3.0 (not more than six semester hours transferred from another accredited graduate program that was not part of a previously awarded degree may be incorporated in the study plan).

(7) Thesis degree: Successful public oral defense of the thesis. Submission of the approved thesis to the Graduate School.

(8) Non-thesis degree: Successful completion of a formal report and presentation.

(9) Students must achieve an overall GPA ≥ 3.0 in all graduate work completed at FIU in their approved study plan.

(10) Completed one semester of the Graduate Seminar course.

(11) Complied with all relevant University policies and regulations.

The following is in addition to the University's graduate admission requirements:

(1) A student seeking admission into the program must have a bachelor's degree in engineering, physical sciences, computer science or mathematics from an accredited institution, or, in the case of foreign students, from an institution recognized in its own country as preparing students for further study at the graduate level.

(2) An applicant must have achieved a "B" average, GPA of 3.0 in upper level undergraduate work. If a student is requesting financial assistance, Graduate Record Examination (GRE) with the following minimum scores on the individual components: verbal ≥143 and quantitative ≥151 is also required.

(3) Applicants who have not satisfied the above will be evaluated for conditional admission.

(4) In addition to the above criteria, international graduate student applicants whose native language is not English are required to submit a score for the Test of English as a Foreign Language (TOEFL) or for the International English Language Testing System (IELTS). A total score of 80 on the iBT TOEFL (equivalent to 550 on the paper-based version, or 213 on the computer-based version of the Test of English as a Foreign Language) or 6.5 overall on the IELTS is required.

(5) The GPA, GRE and TOEFL scores specified above are to be considered minimum requirements for admission. Applicants from science areas other than materials science and engineering will be expected to complete undergraduate courses selected to prepare them for graduate courses in their area of interest. Full admission to the graduate program requires the completion of these background courses with no grades below 'C' and a grade point average of 3.0 or better.

There are no majors associated with this program.

There are no tracks, specializations, concentrations, areas of emphasis, or other curricular offerings associated with this program.