

## Minors

### Materials Science and Engineering - Minor

#### College of Engineering and Computer Science

#### Department of Materials Science and Engineering

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The field of "materials" encompasses concepts in many diverse fields ranging from chemistry, physics, and optics to mechanical, electrical, and chemical engineering. Rapid advances in technology have dramatically increased the importance of materials science and engineering to society. Materials Science and Engineering (MSE) is the study of the structure/processing/properties relationships of engineering materials. Modern MSE encompasses a broad range of materials, from traditional metallurgy to biological materials, polymers, ceramics, semiconductors, composites, and optical and magnetic materials, as well as numerous nanotechnology materials. The study of materials science allows students considerable freedom to the depth of their understanding of such materials while being simultaneously engaged in real world research. Participants in this minor will be able to improve their understanding, awareness and job skills in material selection and application to have additional opportunities and advantages to pursue a career in Engineering. Students taking graduate level EMA courses as Restricted Electives can use them for the Accelerated BS-to-MS program in Materials Science and Engineering.

#### Admission Requirements

- A minimum UCF GPA of 2.5 is required for acceptance into this minor.

#### Minor Requirements

- None

#### Prerequisite Courses

- None

#### Required Courses (9 hrs)

EMA 3124	Design and Selection of Materials	3 hrs
EMA 4102	Thermodynamics and Kinetics of Materials	3 hrs

#### Select 1: (3 hrs)

EGN 3365	Structure and Properties of Materials or	3 hrs
EMA 3706	Structure and Properties of Aerospace Materials	3 hrs

#### Restricted Electives (9 hrs)

#### Select one of the following courses on (3 hrs)

#### properties of materials:

PHZ 3422	Nanophysics	3 hrs
EMA 4223	Fundamentals of Mechanical Behavior of Materials	3 hrs
PHZ 4404	Solid State Physics	3 hrs
EMA 4413	Fundamentals of Electronic Materials	3 hrs
PHY 4445	Lasers	3 hrs
OSE 4520	Laser Engineering	3 hrs
EMA 5104	Intermediate Structure and Properties of Materials	3 hrs
EMA 5415	Electronic Principles of Materials Properties	3 hrs

#### Select one of the following courses on (3 hrs)

#### applications of materials:

EMA 3000	Engineering Polymeric, Ceramic, and Composite Materials	3 hrs
EMA 3014	Nanomaterials Characterization and Applications	3 hrs
EEE 3350	Semiconductor Devices I	3 hrs
EEE 4463	MEMS Devices and Applications	3 hrs
EMA 4506	Emerging Materials	3 hrs
PCB 4521	Tissue Engineering	3 hrs
EMA 5060	Polymer Science and Engineering	3 hrs
EMA 5140	Introduction to Ceramic Materials	3 hrs
EMA 5584	Biomaterials	3 hrs
EMA 5585	Materials Science of Thin Films	3 hrs
EMA 5705	High Temperature Materials	3 hrs

#### Select one of the following courses on materials processing, testing and characterization: (3 hrs)

EMA 3012C	Experimental Techniques in Mechanics and Materials	3 hrs
EMA 3691	Nanomaterials Process Engineering	3 hrs
PCB 4174	Foundation of Bio-Imaging Science	3 hrs
EMA 4503	Materials Characterization Techniques	3 hrs
PHY 4803L	Advanced Physics Laboratory	3 hrs

#### Foreign Language Requirements

- None

#### Total Semester Hours Required

- 18

#### Other Requirements

- A minimum grade of "C" (2.0) or better in all courses in the minor.
- A Bachelors degree must be completed at the time minor is awarded.
- At least 12 hours of courses with EGN and/or EMA prefixes must be used toward the minor requirements.
- Internship or Independent Study credit cannot be used toward the minor.