

## **MSE 1111: Introduction to Materials Science and Engineering (required)**

### **Catalog Description: (0-3-1)**

Prerequisites: None

Corequisite: None

A general introduction to the field of Materials Science and Engineering and the MSE curriculum at Georgia Tech. Topics include: Contemporary issues in MSE, technical writing, ethics, and lab safety.

**Textbook:** None – appropriate notes will be provided for all classes.

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### **Topics Covered:**

1. Bio-enabled Materials
2. CES EduPack Software
3. Structural energetic materials
4. Materials entrepreneurship
5. Porous Carbon for Future Energy Applications
6. Physical color in insects
7. Ceramic Materials
8. Polymers in medicine & nanotechnology
9. Composite Materials
10. Polymers in Industry
11. Technical Communications
12. Research Ethics
13. Laboratory Safety

### **Course Outcomes:**

1. Describe basic materials types and relate their significance in everyday use.
2. Describe and apply correct ethics and professionalism in science and engineering.
3. Describe and implement safe practice in laboratories.
4. Be able to work as part of a team to write a technical report about a material issue.

**Correlation between Course Outcomes and Student Outcomes:**

| Course Outcomes  | Student Outcomes |          |          |          |          |          |          |          |          |          |          |
|--|------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
|  | a                | b        | c        | d        | e        | f        | g        | h        | i        | j        | k        |
| 1. Describe basic materials types and relate their significance in everyday use.         |                  |          |          |          |          |          |          | x        |          | x        |          |
| 2. Describe and apply correct ethics and professionalism in science and engineering.     |                  |          |          |          |          | x        |          |          |          |          |          |
| 3. Describe and implement safe practice in laboratories.                                 |                  |          | x        |          |          |          |          |          |          |          |          |
| 4. Be able to work as part of a team to write a technical report about a material issue. |                  |          |          | x        |          |          | x        |          |          |          |          |
| <b>Entire Course</b>   | <b>0</b>         | <b>0</b> | <b>1</b> | <b>2</b> | <b>0</b> | <b>2</b> | <b>2</b> | <b>3</b> | <b>0</b> | <b>3</b> | <b>0</b> |
| <b>0 = None or insignificant; 1 = Some; 2 = Moderate; 3 = Strong</b>                     |                  |          |          |          |          |          |          |          |          |          |          |

**School of Material Science and Engineering Student Outcomes:**

- a) an ability to apply knowledge of mathematics, science and engineering
- b) an ability to design and conduct experiments, as well as to analyze and interpret data
- c) an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability
- d) an ability to function on multidisciplinary teams
- e) an ability to identify, formulate, and solve engineering problems
- f) an understanding of professional and ethical responsibility
- g) an ability to communicate effectively
- h) the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context
- i) a recognition of the need for, and an ability to engage in life-long learning
- j) a knowledge of contemporary issues
- k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice