

MSE 3021: Materials Laboratory I

Credit hours and contact hours: 1-0-3-2

Instructor: Radhakrishnaiah Parachuru

Textbook: No textbook required.

Specific course information

Catalog description: Characterization of engineering properties of materials through hands-on experiments. Instruction on basic laboratory skills, safety, statistical analysis of data, use of laboratory notebooks and technical report writing.

Prerequisites: MSE 2021 – Materials Characterization

Course: Required

Specific goals for the course

Outcomes of instruction:

1. Enable students to work efficiently in self-managed groups
2. Provide an opportunity to test and verify basic concepts learned in multiple courses
3. Provide an opportunity to analyze data and make correct interpretations
4. Enhance ability in oral and written communication, including technical communication
5. Expose to multiple learning resources and help understand their value for professional growth

Student Outcomes:

- (1) An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
- (5) An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
- (6) An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.

Topics covered:

1. Mechanical Properties of metals, polymers and ceramics
2. Electrical properties of conducting, non-conducting and semi-conducting materials
3. Optical properties of materials

Correlation between Outcomes of Instruction and Student Outcomes:

Outcomes of Instruction	Student Outcomes						
	1	2	3	4	5	6	7
1. Enable students to work efficiently in self-managed groups					X		
2. Provide an opportunity to test and verify basic concepts learned in multiple courses	X				X		
3. Provide an opportunity to analyze data and make correct interpretations	X	X			X	X	
4. Enhance ability in oral and written communication, including technical communication	X				X		
5. Expose to multiple learning resources and help understand their value for professional growth	X				X	X	

School of Materials Science and Engineering Student Outcomes:

- (1) An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
- (2) An ability to apply engineering design to produce solutions that meet specified needs with consideration for public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
- (3) An ability to communicate effectively with a range of audiences.
- (4) An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
- (5) An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
- (6) An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.
- (7) An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.