

MATSCEN 6777 (Proposed): Electronic Properties of Materials

Course Description

In-depth analysis of the structure - property relationships and application of materials in electronics, optics and magnetics.

Prior Course Number: 777

Transcript Abbreviation: ElecPropMat

Grading Plan: Letter Grade

Course Deliveries: Classroom

Course Levels: Graduate

Student Ranks: Masters, Doctoral

Course Offerings: Autumn

Flex Scheduled Course: Never

Course Frequency: Every Year

Course Length: 14 Week

Credits: 2.0

Repeatable: No

Time Distribution: 2.0 hr Lec

Expected out-of-class hours per week: 4.0

Graded Component: Lecture

Credit by Examination: Yes

Exam Types: EM Tests via Office of Testing

Admission Condition: No

Off Campus: Never

Campus Locations: Columbus

Prerequisites and Co-requisites: Graduate standing in Engineering or Science or permission of instructor.

Exclusions:

Cross-Listings:

The course is required for this unit's degrees, majors, and/or minors: Yes

The course is a GEC: No

The course is an elective (for this or other units) or is a service course for other units: No

Subject/CIP Code:

Subsidy Level: Doctoral Course

Programs

Abbreviation	Description
MATSCEN	Materials Science and Engineering

Course Goals

Understand the fundamental chemical and physical bases for the properties that are observed
Have an appreciation for how these properties are used in electronic, optical and magnetic devices
Recognize how materials research and development in these areas can result in improved properties

Course Topics

Topic	Lec	Rec	Lab	Cli	IS	Sem	FE	Wor
The Physics of Solids								
Engineering Electronic Structure								
Overview of Electronic Devices								
Deposition Techniques & Defects								
Semiconductor Alloys								
Organic Semiconductors								
Magnetic Materials								

Grades

Aspect	Percent
Homework	10%
Midterm	40%
Final	50%

Representative Textbooks and Other Course Materials

Title	Author
<i>The Materials Science of Semiconductors</i>	Angus Rockett

ABET-EAC Criterion 3 Outcomes

Course Contribution		College Outcome
***	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.
	d	An ability to function on multi-disciplinary 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 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.

Prepared by: Mark Cooper