

# ECE 5833 (Proposed): Organic Conducting Devices

## Course Description

Conducting organic small molecules and polymers (structural, optical and electrical properties); organic light emitting diodes; transport and carrier injection; organic transistors; organic lasers.

**Prior Course Number:** 835.02

**Transcript Abbreviation:** Organic Devices

**Grading Plan:** Letter Grade

**Course Deliveries:** Classroom

**Course Levels:** Undergrad, Graduate

**Student Ranks:** Senior, Masters, Doctoral

**Course Offerings:** Spring

**Flex Scheduled Course:** Never

**Course Frequency:** Odd Years

**Course Length:** 14 Week

**Credits:** 3.0

**Repeatable:** No

**Time Distribution:** 3.0 hr Lec

**Expected out-of-class hours per week:** 6.0

**Graded Component:** Lecture

**Credit by Examination:** No

**Admission Condition:** No

**Off Campus:** Never

**Campus Locations:** Columbus

**Prerequisites and Co-requisites:** Prereq: 3030 (432), or permission of instructor for non-ECE majors; or Grad standing in engineering, biological sciences, or math and physical sciences.

**Exclusions:** Not open to students with credit for 7833 (835.02) or 5194.04.

**Cross-Listings:**

**Course Rationale:** Existing course.

**The course is required for this unit's degrees, majors, and/or minors:** No

**The course is a GEC:** No

**The course is an elective (for this or other units) or is a service course for other units:** Yes

**Subject/CIP Code:** 14.1001

**Subsidy Level:** Doctoral Course

## Course Goals

Gain a fundamental understanding of the field of organic conducting polymer devices and their potential impact
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## Course Topics

Topic	Lec	Rec	Lab	Cli	IS	Sem	FE	Wor
Motivation for study of organic conducting devices	2.0							
Materials properties/synthesis	4.0							
Materials parameter space	4.0							
Processing issues for organics	4.0							
Organic light-emitting diodes	4.0							

Topic	Lec	Rec	Lab	Cli	IS	Sem	FE	Wor
Organic Electronics	4.0							
Organic solar cells	4.0							
Molecular electronics with NDR & organic lasers	3.0							
Carbon-based electronics (nanotubes and graphene)	4.0							
Organic sensors (bio & chemical)/Future market opportunities	4.0							

## Representative Assignments

In-class Discussion
Powerpoint Presentations of State-of-the-Art issues
Term Paper

## Grades

Aspect	Percent
Class Discussions	20%
Class presentations	40%
Term Paper	40%

## Representative Textbooks and Other Course Materials

Title	Author
<i>Organic and Printed Electronics: Fundamentals and Applications</i>	G. Nisato, D. Lupo, S. Ganz

## 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.

## Additional Notes or Comments

Updated prereqs, exclusions, goals and topics to conform to university format 3/29/12

renumber from 7833

Modified prereqs to include ECE seniors and graduate students from Chemistry, Physics,

etc.

Changed semester of offering to autumn odd and spring odd. 3/23/15.CED

Correct prereqs, to include grad students, and add "seniors" as level; 2/18/14

Captialized "Graduate" in prereqs to match university version.

Clarify prereqs to Prereq: 3030 (432), or permission of instructor for non-ECE majors; or Grad standing in engineering, biological sciences, or math and physical sciences. 8/26/14  
BLA

Changed text to Nisato et all 3//16 BLA

Edited text info, 5/10/17, CED

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