

MATSCEN 4381.02 (Approved): Design and Professional Practice I, Biomedical

Course Description

First course in a two-course MSE Senior Design sequence with a biomedical engineering emphasis. Introduction to design principles; challenges of biomedical device design; projects focus on helping persons with disabilities.

Transcript Abbreviation: Sr Design, Biomed

Grading Plan: Letter Grade

Course Deliveries: Classroom

Course Levels: Undergrad

Student Ranks: Senior

Course Offerings: Autumn

Flex Scheduled Course: Never

Course Frequency: Every Year

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: 3141; 3151; 3331; prereq or concur 3261, and/or 3271, and/or 3331; enrollment as MATSCEN-BS major; or permission of instructor.

Exclusions:

Cross-Listings: BME 4901

Course Rationale: Permits MSE students with an interest in biomedical engineering applications of MSE to work in design teams with BME students.

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: 14.1801

Subsidy Level: Baccalaureate Course

Programs

Abbreviation	Description
MATSCEN	Materials Science and Engineering

General Information

First course in a two-course Senior Design sequence. The course sequence provides a capstone for undergraduates in MSE and is focused on hands-on design experiences that help persons with disabilities, technical communication, and learning the commercialization process.

Course Goals

Students will be able to abstract engineering specifications from clinical needs by applying various design analysis methods
Students will be able to demonstrate engineering design and optimization by building a small medical device in a team environment;
Students will be able to make a professional presentation and write a technical team report.

Course Topics

Topic	Lec	Rec	Lab	Cli	IS	Sem	FE	Wor
Design Process	14.0							
Design Projects	14.0							
Physiology, team-building, device needs finding and specifications	14.0							

Grades

Aspect	Percent
Mini-Project	30%
Homework & Class Assignments	20%
Class Attendance and Participation	10%
Presentations	40%

Representative Textbooks and Other Course Materials

Title	Author
<i>Design of Biomedical Devices and Systems, Marcel Dekker, 2003</i>	King, P.H. and R.C. Fries

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.

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