



BME 496 - Capstone Design II

3 Credits,

7 Credit hours

Instructor: Joel Schesser, Ph.D.

Textbook(s)/Materials Required:

Class lecture notes

Description:

Capstone Design II continues the design process. You will complete the design you started in Capstone I by developing design specifications and a test plan; building and testing the product; and demonstrating how well it meets the customer needs. Successful completion of the program requires satisfying the course requirements and your customer.

Prerequisites by topic: BME 495

Objectives:

1. The student teams can successfully complete the development and testing of a biomedical engineering technology-based project. Here, students demonstrate engineering documentation for the selected project using industry standing testing processes and documentation.
2. Students can successfully demonstrate the project by executing a test plan that reflects on the achievement of product specifications based on customer needs.
3. The results identify constraints that affected the design, including several relevant fields such as regulatory issues, size, weight, time, cost, safety, testing with animals or human subjects, working with tissues, etc.
4. Student successfully managed and executed a project plan with schedule, tasks, budget and risk analysis.
5. Students can use effective research and critical thinking skills while developing an understanding of ethical issues in research and design.
6. Students can successfully perform multi-disciplinary teamwork, including written and verbal communication skills, while monitoring and updating project progress using planning and milestone management.
7. Students act in a professional manner including identification of skills needed to acquire, sharing responsibilities, and professional meeting attendance.
8. Students recognize the need for outside of classroom learning including keeping abreast with industry-wide professional technical engineering documentation skills.

Student Outcomes:

BME 496 Course Learning Outcome (CLO) is - ability to design a system, component, or process to meet needs with realistic constraints

ABET Student Outcome 2 - an ability to apply engineering design to produce solutions that meet specified needs with consideration of **public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors**

Related CLOs: 1,2,3,4,5

BME 496 Course Learning Outcome (CLO) is - ability to function on multi-disciplinary teams

ABET Student Outcome 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

Related CLOs: 4,6,7

BME 496 Course Learning Outcome (CLO) is - ability to identify, formulate, and solve engineering problems

ABET Student Outcome 1 - an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.

Related CLOs: 1,2,3,4

BME 496 Course Learning Outcome (CLO) is - understanding of professional and ethical responsibility

ABET Student Outcome 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 .

Related CLOs: 5,7

BME 496 Course Learning Outcome (CLO) is - ability to communicate effectively

ABET Student Outcome 3 - an ability to communicate effectively with a **range of audiences.**

Related CLOs: 6

BME 496 Course Learning Outcome (CLO) is - broad education to understand the effect of engineering solutions in a global, economic, environmental, and societal context

ABET Student Outcome 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 .

Related CLOs: 1,2,3,5

BME 496 Course Learning Outcome (CLO) is - recognition of and an ability to engage in life-long learning

ABET Student Outcome 7 - an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

Related CLOs: 5,8

BME 496 Course Learning Outcome (CLO) is - knowledge of contemporary issues

ABET Student Outcome 2 - an ability to apply engineering design to produce solutions that meet specified needs with consideration of **public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors**

Related CLOs: 1,2,3,5

Topics:

Design specifications development and traceability

Design reviews

Industrial design, ergonomics, performance, aesthetics

Industry Standard Test Procedures and Documentation

Reliability and performance testing

Test plans

Ethics in biomedical engineering

FDA

Regulatory issues

Product Demonstrations

Professional Component: Biomedical Engineering Core Topics