

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: BME 495

Co requisite: none

Objectives:

1. Project Implementation: Complete the development and testing of a biomedical engineering technology-based project. . Develop engineering documentation for the selected project. Demonstrate the project.
2. Use effective research and critical thinking skills while developing an understanding of ethical issues in research and design.
3. Perform multi-disciplinary teamwork, including written and verbal communication skills, while monitoring project progress using planning and milestone management.

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

| Performance Criteria | Specific Activity During the Course | Assessment Methods/Metrics |
|--|---|---|
| Course Objective 1: Identify a biomedical problem or need and propose the design of a biomedical engineering technology-based project to meet those needs using the engineering design process, using standard engineering methods to document the customer needs/requirements, competitive analysis, high level specifications, design specifications, design concepts, and a project plan with schedule, tasks, budget and risk analysis. | | |
| C-2 Identify constraints for a given design | Competitive Analysis and Identifying Constraints that will affect 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. | Final Report |
| C-3: Develop tests of a proposed design solution | Using industry standing testing processes and documentation | Test Plan |
| Course Objective 3: Perform multi-disciplinary teamwork, including written and verbal communication skills, while monitoring and updating project progress using planning and milestone management. | | |
| D-1: Ability to function on multidisciplinary teams | Evaluation of Teamwork and Sharing Responsibilities | Presentation evaluation sheet, "Teamwork" item |
| E-1 Ability to identify, formulate, and solve engineering problems | Evaluation of Design meeting customer needs | Final Report |
| F-1 Understanding of professional and ethical responsibility | Plagiarism and engineering ethics studies | Proper annotation of research materials Ethical Dilemma homework essay |
| G Ability to communicate effectively | Professional meeting attendance and identification of skills to acquire | Midterm and Final Presentations |