Dr. J Schesser

NJIT Department of Biomedical Engineering

BME 496 Senior Capstone Design II

Instructors: Dr. Joel Schesser (joel.schesser@njit.edu), Fenster 610, x3193

Class Hours: All: Tuesday 4:00pm - 5:20pm, (Lecture) GITC 1400
002/HM2: Thursday 2:30pm - 5:20pm, (Status/Lab) 698
004/HM4: Friday 1:00pm - 3:50pm, (Status/Lab) 698
008/HM8: Monday 2:30pm – 5:20pm, (Status/Lab) 698

Office Hours: By appointment

Welcome back to Capstone Design!

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.

TEXT

None. Supplemental handouts will be provided as needed.

COURSE DESCRIPTION:

Prerequisites: BME 495.

This portion of the project includes library research, time and cost planning, oral and written reports, as well as construction, troubleshooting and demonstration of a working prototype.

LEARNING OUTCOMES:

By the end of the course you will be able to do the following:

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
Industrial design, ergonomics, performance, aesthetics
Test plans
Regulatory issues
Design reviews
Reliability and performance testing
FDA

COURSE OUTLINE*:

Wk#, Tues Date	Lecture (Tuesday)	Lab/Status (Thursday/Friday) (Monday)	Deliverables This Week On Tuesday
1: 1/20	1.Review of Course 2.Capstone Lab 3. Meeting Schedule 4. Requirements 5. NEBEC XX Virtual TBD Deadline 6. Presentations/Demos 7.Status Mtgs, Work	Status Mtgs, Work (Monday Class – No Meeting)	
2: 1/27	-Performing Design Reviews - Makeup of Product Design Teams NEBEC XX Virtual TBD Deadline	Status Mtgs, Work (Monday Class – 1/26)	- Update project plan (T) (Monday/Thursday/Friday) - High Level Requirements (T) (Monday/Thursday/Friday)
3: 2/3	- Generating Test Plans - Traceability to Requirements - Review of Laser Mouse Test Plan - Testing: Reliability, Performance	Status Mtgs, Work (Monday Class – 2/2)	**- Final High Level Requirements (T) (Monday/Thursday/Friday)**
4: 2/10	- NEBEC Attendance - Testing: Reliability, Performance **-Industrial Standards**	- Design Review Requirements Status Mtgs, Work (Monday Class – 2/9)	**-Review of Requirements 2 Reviewed Copies (At the Review) (Monday/Thursday/Friday)-** **-Preliminary Test Plans (T) (Thursday/Friday)**
5: 2/17	-Business Conduct **-Industrial Standards**	Status Mtgs, Work Design Review Requirements (Monday Class – 2/16)	**- Test Plan Document (T) (Thursday/Friday)** **-Preliminary Test Plans (T) (Monday)**
6: 2/24	-Regulatory (FCC, ISO, UL, Shake and Bake) -FDA/Design Controls	Status Mtgs, Work (Monday Class – 2/23)	**- Test Plan Document (T) (MondayThursday/Friday)**

7: 3/3	-- Prepare for Design Review -FDA/Design Controls - Intellectual Property and Invention Disclosure Forms	-Design Reviews Test Plans Status Mtgs, Work (Monday Class – 3/2)	**- Review of Test Plans 2 Reviewed Copies (At the Review) (Thursday/Friday)** **-Test Plan Document (T) (Monday)**
8: 3/10	- Midterm Presentation - Demo - Conference	Status Mtgs, Work Design Review Requirements (Monday Class – 3/11)	**Standards Homework (T)** **Preliminary/Draft of Midterm Presentations (Thursday/Friday)** **Review of Test Plans 2 Reviewed Copies (At the Review) (Monday)**
Spring Break			
9: 3:24	-Ethics in Biomedical Product Design Midterm Presentations	**Midterm Presentations** Status Mtgs, Work (Monday Class – 3/23)	**- PPT Presentation (T) (all emailed by 8 PM (Wednesday/Thursday)**
10: 3:31	- - Demos -How to Get a Job. Guest Lecturer Ron Rockland, Assoc. Dean, Newark College of Engineering	**Status Mtgs, Work Thursday Class 4/2** **No Class Friday Class 4/3** **Midterm Presentations** (Monday Class – 3/30)	**Standards Homework (T)** **- NEBEC paper** **- Invention Disclosure Forms (T) (Tuesday)** **- Ethics Assignment (I) (Tuesday)** **-FDA Homework (T) (Tuesday)**
11: 4/7	Demonstrations	**Demonstrations Thursday Class 4/9** Status Mtgs, Work **(Friday Class 4/10)** (Monday Class – 4/6)	**- Thursday Class: Demo Agenda at the time of the Demo**

12: 4/14	- Schedule for Final Demonstrations - How to develop a final report and presentation - Faculty Assessment - Schedule for Final Presentations	**Status Mtgs, Work (Thursday Class 4/14)** **Demonstrations (Friday Class 4/15)** (Monday Class – 4/13)	- **(Thursday Monday Class)** - **Demo Agenda at the time of the Demo** -
13: 4/21	- Demonstrations - How to develop a final report and presentation Schedule for Final Presentations	**Demonstrations Thursday Class 4/23:** Status Mtgs, Work **(Friday Class 4/24)** (Monday Class – 4/20)	- **Thursday Class: Demo Agenda at the time of the Demo**
14: 4/28	- How to develop a final report and presentation - Faculty Assessment - Schedule for Final Presentations	**Final Presentation (Thursday Class 4/30)** **Demonstrations (Friday Class 5/1)** (Monday Class – 4/27)	**Thursday Class: Final deliverables emailed by 8PM Wednesday, May 5, no exceptions: Presentation, Final Report, Poster Paper and video** - **Thursday Monday Class** - **Demo Agenda at the time of the Demo**
15: 5/6	**No Tuesday Schedule** **Monday/Friday Schedule**	**No Class (Thursday Class)** **Final Presentation (Friday Class 5/6)** (Monday Class – 5/5)	**Monday Class: Final deliverables emailed by 8PM Monday, May 4, no exceptions: Presentation, Final Report, Poster Paper and video** **- Friday Class: Final deliverables emailed by 8PM Tuesday, May 5, no exceptions: Presentation, Final Report, Poster Paper and video**

***The Course Outline may be modified at the discretion of the instructor or in the event of extenuating circumstances. Students will be notified in class of any changes to the Course outline and schedule verbally and via the website schedule.**

Assignments and guidelines for deliverables will be made available via email and the website throughout the term. You are responsible for monitoring your email for timely messages.

GRADING:

- 20% - Face-to-face status meetings, emailed weekly progress reports, regular meetings with the customer, customer's feedback on meetings, demos, and presentations (Team&Individual grade)

- 15% - Midterm Presentation (Individual and Team grade)
- 20% - Final Report (WITH advisor signature) (Team grade)
- 15% - Final presentation (Individual and Team grade)
- 30% - Demonstrations, Quizzes/HW, Performance Review, Attendance, Team Assessments from Instructors and Customer (Individual)

Attendance is mandatory. Failure to attend class regularly will result in a failing grade.

Additional Information on Grading

- Quizzes are unannounced and may cover any information covered in class.
- Final Reports are due at the start of the final presentations.
- Teams are expected to invite customers to all presentations and demonstrations.
- Teams must get customer approval for all demonstrations **before** they are presented to instructors.
- CUSTOMER FEEDBACK FORMS ARE REQUIRED AND PART OF YOUR GRADE.

Honor Code Violations/Disruptive Behavior:

NJIT has a zero-tolerance policy regarding cheating of any kind and student behavior that is disruptive to a learning environment. Any incidents will be immediately reported to the Dean of Students. In the cases the Honor Code violations are detected, the punishments range from a minimum of failure in the course plus disciplinary probation up to expulsion from NJIT with notations on students' permanent record. Avoid situations where honorable behavior could be misinterpreted.

No eating or drinking is allowed at the lectures, recitations, workshops, and laboratories. Cellular phones must be turned off during the class hours.