BENG 492: Senior Advanced Design Project I
Fall 2014
Last Modified: 8/11/2014

Instructor:
Dr. Laurence C. Bray
- E-mail: lbray2@gmu.edu
- Phone: 703-993-2218
- Office: Nguyen Engineering Building, Room 3911
- Office hours: Mondays from 12 to 1pm (Or by appointment)

Class webpage: http://mason.gmu.edu/~lbray2/classes/492/F2014/menu.html
Website: http://bioeng-proj.vse.gmu.edu/beng-492/

Lectures:
- Friday: 11:30am-2:15pm, Nguyen Engineering Building, Room 2608

Important Notes and Dates:
- Final Exam: Friday, December 12: 11:30am-2:15pm
- Holidays: Thursday & Friday, November 27 & 28 (Thanksgiving)

Optional Textbook:

Course Description:
- Catalog:
  - Conception of senior design project in bioengineering and determination of feasibility of proposed project. Work includes developing preliminary design and implementation plan.

Prerequisites:
- Courses:
  - 90 credit hours applicable to the Bioengineering Program, COMM 100.

Requirement or Elective:
- This course is a capstone design experience for bioengineering students.

Course Objectives:
- The students will be able to solve a larger comprehensive engineering problem and evaluate alternative approaches.
- Students will be able to design a system, component, and their interfaces.
- Students will be able to work on a team, organize their team, and assume different roles.
- Students will gain familiarity with engineering practice in developing a proposal, design document, implementation plan, and giving oral presentations.
**Course Topics:**
- Engineering design
- Teams and teaming
- Project selection
- Requirements specification and analysis
- Conceptual design
- System design
- System modeling
- Proposal preparation
- Design review
- Presentations
- Early prototyping
- Project management
- Testing

**Students Outcomes:**
- Student will be able to design a system, component or process to meet desired needs. They will develop a satisfactory solution to stated problem, apply engineering and/or scientific principles in solving this problem, and will be able to use acquired knowledge in identifying and designing system components (“outcome c”).

- Students will function on a multi-disciplinary team. They will be able to organize the team effectively and engage in meaningful participation by team members of different knowledge and skills. Students will be able to carry projects involving multi-disciplinary aspects (“outcome d”).

- Students will be able to identify and solve engineering problems. They will formulate a problem and identify technical issues and non-technical aspects contributing to a problem solution. They will be able to analyze a problem, decompose it, and understand how the various pieces of the problem relate to each other. They will be able to evaluate their design and the success of the project based on experimental data/results (“outcome e”).

- Students will communicate effectively both orally and in writing (“outcome g”).

**Assignments, Examinations and Grading:**

**Homework Assignments:**
- There will be a number of homework assignments. These consist of practice questions and exercises which are intended to assist the student in mastering the course content. Some of these assignments will be collected and graded, but you will be informed in advance when an assignment is to be handed in.

**Exams:**
- There will be no in-class exams.
Projects:
- This class is based on a group project (Team of 3 to 4 students – TBD).
- A list of projects will be given at the beginning of the semester.
- Each student will give one introduction presentation (5 minutes).
- Each group will give one in progress presentation (10 minutes).
- Each group will give a final presentation (20 minutes).

All formal homework assignments are to be treated as individual and not collective efforts, unless specified otherwise. A severe penalty will be given to any assignment which indicates collusion or cheating. The usual penalty for cheating is failure in the course.

Late Submission Policy:
- All assignments will be submitted via blackboard by 5pm on the day in which they are due. [See https://mymasonportal.gmu.edu/webapps/portal/frameset.jsp]. Any assignments turned in after the submission deadline will be graded as late.
- The penalty for late assignments will be a one grade point deduction (i.e., B to C) for each day (or part thereof) following the due date (This late policy will apply to all assignments for which no application for extension has been made).

Grading Structure:
- The final grade will be based on (Tentative, subject to change):

<table>
<thead>
<tr>
<th>BENG 492</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attendance/Participation</td>
</tr>
<tr>
<td>Homework Assignments</td>
</tr>
<tr>
<td>Project Presentations</td>
</tr>
<tr>
<td>Prototype</td>
</tr>
</tbody>
</table>

- Letter grades will be based on a 10 point scale ([90, 100] = A, [80, 90) = B, ...)

Important Notes:
- I will be using a +/- grading system.
- Every project must be completed, working, and turned in. For each project that is not, the final grade in the course may be lowered.

GMU Policies and Resources for Students:
- Students must adhere to the guidelines of the George Mason University Honor Code [See http://academicintegrity.gmu.edu/honorcode/].
- Students must follow the university policy for Responsible Use of Computing [See http://universitypolicy.gmu.edu/all-policies/].
- Students are responsible for the content of university communications sent to their George Mason University email account and are required to activate their account and check it
regularly. All communication from the university, college, school, and program will be sent to students solely through their Mason email account.

- The George Mason University Counseling and Psychological Services (CAPS) staff consists of professional counseling and clinical psychologists, social workers, and counselors who offer a wide range of services (e.g., individual and group counseling, workshops and outreach programs) to enhance students’ personal experience and academic performance [See http://caps.gmu.edu/].
- Students with disabilities who seek accommodations in a course must be registered with the George Mason University Office of Disability Services (ODS) and inform their instructor, in writing, at the beginning of the semester [See http://ods.gmu.edu/].
- Students must follow the university policy stating that all sound emitting devices shall be turned off during class unless otherwise authorized by the instructor. The George Mason University Writing Center staff provides a variety of resources and services (e.g., tutoring, workshops, writing guides, handbooks) intended to support students as they work to construct and share knowledge through writing [See http://writingcenter.gmu.edu/].

Professional Dispositions:
- Students are expected to exhibit professional behaviors and dispositions at all times.

Core Values Commitment:
- The College of Education & Human Development is committed to collaboration, ethical leadership, innovation, research--based practice, and social justice. Students are expected to adhere to these principles. [See http://cehd.gmu.edu/values/].