

**BE 1252: Biology in Engineering
Spring 2013 Syllabus**

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Office hours: Tuesday afternoons, 1:30-3:30 pm or by appointment

Credit hours: 2 (1 hour lecture, 3 hours lab per week)

Meeting Schedule: Lecture Tuesday 12:40 - 1:30, 221 Tureaud
Lab section 1: Wednesday, 1:40 – 4:30, Rm. 115 EB Doran Bldg.
Lab section 2: Thursday, 1:40 – 4:30, Rm. 115 EB Doran Bldg.

Final exam: Monday, May 6, 3:00 pm – 5:00 pm., in the room in which lecture was held

Prerequisites: none

Course designations: This is a service-learning course and a communication intensive course

Course description: Effect of variability and constraints of biological systems on engineering problem solving and design; engineering units; engineering report writing; oral report presentation; laboratory demonstration of biological engineering analysis.

Objectives: After completing this course, you should be able to:

1. Define and discuss engineering and biological engineering.
2. Be more confident in yourself and your learning process, including why you picked this (or another) major.
3. Understand in some depth the area of biological engineering (or a different discipline) in which you want to study
4. Communicate with your community partner(s) and your peers, and apply rudimentary techniques for effectively working together and resolving conflicts.
5. Understand the process of engineering design, including the following: what is engineering design, how does one approach a problem using the engineering method,

impact of social and technical factors on design, evaluation methods in design, and effective communication of a design.

6. Be proficient with ASTM and CPSC playground safety and design standards (well enough to pass the national exam for Certified Playground Safety Inspectors)
7. Create a playground design that captures “the soul of the community.”
8. Explain the connection between what you learned through service outside the classroom (with Delmont or Wildwood) and instruction inside the classroom.
9. Understand the significance of communicating, and how it affects your strength as an engineering student

Course Texts:

Lima, M. and Oakes, W. 2006. *Service-Learning: Engineering in Your Community*. Oxford University Press / Great Lakes Press, Wildwood, MO., 323 pp., ISBN13: 978-0-19-9767823 (Oxford); ISBN10: 0-19-976782-3 (Oxford) ISBN: 1-881018-94-6 (Great Lakes Press).

Handbook for Public Playground Safety. U.S. Consumer Product Safety Commission, Publication #325, <http://www.cpsc.gov/cpsc/pub/pubs/325.pdf> (free).

Course approach

This is a service-learning course. Service-learning is defined as “a credit-bearing, educational experience in which students participate in an organized service activity that meets identified community needs and reflect on the service activity in such a way as to gain further understanding of course content, a broader appreciation of the discipline, and an enhanced sense of civic responsibility.¹”

You will accomplish all of the learning objectives in this course by completing a service-learning project that concerns biological engineering and addresses a community need. This process is a mutual exchange of knowledge, information and service between the community (through community partners) and each of you.

This year, each lab section will be working in a group of 3-4 students to **design a playground in conjunction with a local public school community**. Each of these playgrounds will be designed by end of the semester, and will hopefully be constructed at some point in the future. Section 1 will working with Delmont Elementary School and section 2 will be collaborating with Wildwood Elementary School.

¹ Bringle, R. and J. Hatcher. 1995. A service-learning curriculum for faculty. *Michigan Journal of Community Service Learning*, 2: 112-122.

Additionally, each of you will be paired with a child at your partner school; you will be serving as a Reading Friend to enable a child currently performing below grade level expectations to successfully reach grade level mastery in reading. You will be required to make at least 8 visits to your partner school to meet with your reading buddy. You will be trained to tutor during class through an organization called Volunteers in Public Schools (VIPS) and their program EveryBody Reads.

Overall approach to service-learning project:

Weeks 1-4

- Learn about engineering design and the engineering design method
- Learn about designing playgrounds
- Learn about your group members and create policies for decision-making and management issues
- Information gathering on community partner and addressing community needs (meet with contact and community members, site visit)

Weeks 5-8

- Continue information gathering with community partners (second site visit, further discussions with community partners) and professional playground designers
- Generate preliminary designs
- Initial check on designs by instructor

Weeks 9-12

- Create and refine final design with input from instructor, community partners, and experts

Weeks 13-15

- Presentation of final design to community partners
- Completion of report/proposal of playground design

Subsequent to semester:

- Instructors and community partners take all designs and suggestions from panel, and streamline them into one consolidated design that best addresses community needs
- Instructors (and interested students) present streamlined design to community partners for further input, and a final design is agreed upon
- Fundraising and grant writing for playground project is completed
- Construction will take place with community and student volunteers

Using this approach in BE 1252, students have designed approximately 25 playgrounds; 17 of these have been built. Additionally, the LSU Community Playground Project works with schools

year round; through this 15-year program, a total of 28 playgrounds have been built in Baton Rouge and surrounding parishes. Our collective work has resulted in 10,000 children using our community-designed playgrounds every school day.

This is a certified **Communication-Intensive (C-I)** course which meets all of the requirements set forth by LSU's Communication across the Curriculum program, including

1. Instruction and assignments emphasizing informal and formal written and spoken communication;
2. Teaching of discipline-specific communication techniques;
3. Use of draft-feedback-revision process for learning;
4. Practice of ethical and professional work standards;
5. 40% of the course grade rooted in communication-based work; and
6. Have a student/faculty ratio no greater than 35:1.

Students interested in pursuing the LSU Distinguished Communicators certification may use this C-I course for credit. For more information about this student recognition program, visit www.cxc.lsu.edu.

For those of you who do not enjoy writing and speaking, keep in mind that:

- One of the main complaints of employers regarding entry level engineers is lack of communication skills.
- You will spend a significant amount of your time communicating (especially writing) on the job as a practicing engineer.
- No matter what you do after graduation, your ability to communicate well will make you successful in *any* future career.

I will try to make this experience as fun and painless as possible!

Grading policy:

Grades will be determined based on the following break down:

3 1-hour exams (15% each)	45%
Lab attendance	5%
Successful completion of VIPS tutoring (7% completing visits, 3% on reflection essay you write on this process)	10%
Homework	20%
Group design project (the final exam)	20%

(10% individual contribution, 10% group grade, grades determined in consultation with peers and community partner)

A number of criteria are used for grading because each of us has strengths in different areas. **My objective is for each of you to shine in this course.** In past years, there has been no curve in this class (that is, 89.5% and above is an A, 80-89.4% is a B, 70-79.4% is a C, 60-69.4% is a D, and <60% is an F); I expect the same situation to prevail this year.

Homework assignments. Homework must be turned in on time to receive full credit. **Assignments must be turned in to Angie Singleton in room 149 of the E.B. Doran Building (the front office of the biological engineering building) by 4:00 p.m. the day they are due in order to be considered on time! Late assignments will receive 20% off for each day that they are late!**

You will have the opportunity to re-submit some of the assignments in this course, for example, the final playground design report/proposal that you will complete as a team. **Writing assignments usually take multiple drafts, or chances of re-writing, before they are outstanding.**

I will be taking attendance in lab this semester! The percentage of labs that you attend will be one of your quiz grades! For example, if you attend 13 of 15 lab sessions, then your attendance grade is $13/15 * 100 = 87\%$. This grade represents 5% of your final grade. If you miss labs, it is your responsibility to **MAKE UP THE LAB.**

I will excuse a lab absence in very few cases; these include illness (and then only with a valid doctor's note) and a death in the family (and then only with a valid obituary).

If you know you're going to miss class in advance, let me know and I will make arrangements to let you know what you're going to miss.

I will also be taking note of how many visits you make to your partner school to tutor, as follows:

Required visits to your partner school (8 minimum, worth a total of 7% of your grade). If you make 6 visits, then your grade is $6/8 * 100 = 75\%$. Research has shown that tutoring is most effective when tutees receive regular visits (ie, weekly). If you have effectively spread your visits over the course of the semester, you will receive a bonus for proper timing. **You must turn in the VIPS visitor reports to VIPS every month in order for your visits to count!!** These will be e-mailed to you by VIPS.

Course policies:

1. Put your cell phones on vibrate before you come to class. Please refrain from using your cell phone in class—I will do my best to keep class so interesting that you will forget that you have one! ☺ During lab, you will also get periodic breaks so that you can check your phone.

2. Although we expect each of you to attend all classes, arrive punctually, and participate, your final grade for this course will not be based on these criteria (**except for attendance at lab**). However, **if you attend class regularly and on time, and if you participate in class discussion, it could make the difference in getting the higher letter grade if you are on the borderline between two**. If you miss class, you are responsible for finding out what you missed from your classmates! Check Moodle for class notes.

3. **Cheating and plagiarism will not be tolerated!** I check work carefully, and will report any student I suspect of academic misconduct to the Dean of Students, Dr. Kathleen White. It is okay to work together on homework assignments but it is NOT okay to COPY someone's work (or to allow someone to copy yours). Check with me or the Code of Student Conduct ([http://appl003.lsu.edu/slas/dos.nsf/\\$Content/Code+of+Conduct?OpenDocument](http://appl003.lsu.edu/slas/dos.nsf/$Content/Code+of+Conduct?OpenDocument)) if you have questions on this matter; it is better to find out all the information you need up front, vs. asking for forgiveness later! The reporting process would be agonizing for all of us, but I will do it if I have to. **As a faculty member of LSU, it is my responsibility to uphold academic integrity, and the reputation of this university. I take this responsibility very seriously.**

4. **Group work.** A significant portion of what you learn in this course will be accomplished in a group setting. Your grade for the group design project is worth a significant portion of your grade for this course, and **will be determined by me** with input from you, your community partners, and other members in your group, each of whom will complete a confidential evaluation of all group members. If you do not participate and attend meetings, your grade may suffer as a result! The grading rubric is as follows::

- Good citizen and group member (attitude, respectfulness, listening, group and communication skills, attendance at in and out of class meetings): 33.3%
- Dependability (did what needed to be done in a timely manner): 33.3%
- Contribution to design project (quality of work, quantity of work): 33.3%

GOOD LUCK with the semester and I look forward to working with you!!