

# EGR 291 - Sophomore Project

## Spring 2019

<b>Instructors</b>	<p>Kurt DeGoede (Professor of Engineering and Physics) 161-B Esbenshade Hall (next to the Hideaway) Office Phone: 717-361-1380 (anytime) Cell (text): 717-419-9568 (before 10:00 PM, with no calls between 1:00 PM Saturday and 4:00 Sunday) Email: <a href="mailto:degoedek@etown.edu">degoedek@etown.edu</a></p> <p>Jean Batista Abreu (Assistant Professor of Engineering and Physics) 161-C Esbenshade Hall Office Phone: 717-361-4770 (anytime) Email: <a href="mailto:batistajc@etown.edu">batistajc@etown.edu</a></p>
<b>Office Hours</b>	<p>Dr. DeGoede: M 12:30 – 3:30 PM; Tu 2:00 – 3:30 PM; W 12:00 – 1:30 PM Or by appointment. Please feel free to stop by my office anytime, if my door is closed please leave a note.</p> <p>Dr. Batista: MWF 12:30 – 1:30 PM; TH 10:30 – 11:30 AM Or by appointment. Please feel free to stop by my office anytime, if my door is closed please send an email.</p>
<b>Overview</b>	<p>It is exciting to participate in this course because we get to live out the College's motto – <i>Educate for Service</i>. You get to use your engineering knowledge and skills to help others and, in the process, gain a deeper understanding of what it means to identify and solve problems with a real client. Often, the projects seem simple, but understanding the client's underlying needs and constraints, and communicating professionally with members of the community can be challenging. We hope you find very fulfilling that YOU, as an engineer, can make someone else's life better.</p>
<b>Class Hours</b>	<p>This course does not have a formal time for lecture. Project group meetings will be scheduled at mutually convenient times.</p>
<b>Prerequisites</b>	<p>None.</p>
<b>Textbook</b>	<p>None. Excerpts from Pugh's Total Design will be posted on Canvas.</p>
<b>Course Description</b>	<p>An engineering project performed in small teams under the supervision of the instructor. Progress reports and a final report and presentation are required. <b>Signature Learning Experience: Community-Based Learning</b>. Spring semester. 1.00 Credit.</p>
<b>Expectations of Behavior</b>	<p>You are representing Elizabethtown College - you must dress and communicate in a professional manner, and respect your client's time, expertise, and needs.</p>
<b>Student Learning Outcomes</b>	<p>Students will leave this course with an improved ability to:</p> <ol style="list-style-type: none"><li>1. Apply engineering design to produce solutions that meet specified needs (ABET-2)</li><li>2. Function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives (ABET-5)</li></ol>

3. Recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions (ABET-4)
4. Communicate effectively with a range of audiences (ABET-3)
5. Integrate engineering knowledge to address community problems (Signature Learning Experiences: Community-Based Learning)

<b>Grading</b>	Required Project Management Elements (PMEs)	15	%
	Meeting Attendance	10	%
	Progress Reports	25	%
	Reflections on Community Based Learning	10	%
	Final Product, Presentation, and Report	40	%

A	Outstanding	93.0	–	100%
A-		90.0	–	92.9
B+		87.0	–	89.9
B	Good	83.0	–	86.9
B-		80.0	–	82.9
C+		77.0	–	79.9
C	Acceptable	73.0	–	76.9
C –		70.0	–	72.9
D +		67.0	–	69.9
D	Poor	63.0	–	66.9
D –		60.0	–	62.9
F	Failing	0.00	–	59.9

**Required PMEs** **Due on Mondays at 11:59 pm, submitted through Canvas.** The following elements will be assessed on completeness, clarity, and on the level to which the individual and team are making appropriate progress on the project. *Late work will not be accepted, but we will drop the lowest PME score.*

- Submit weekly team meeting minutes using template provided, including peer assessment (you must meet in person as a team at least once each week of the semester)
- Individual weekly work reports (you are expected to work a total of 3 hours every week on the project portion of the course) Students will be required to evaluate one another's progress using the rubric provided in Canvas. Professors assessing PMEs will use the score determined by the team unless they observe discrepancies.
- Required templates for these PMEs are provided on Canvas

**Meetings with Instructors** Each team is required to meet with specified instructors four times over the course the semester, with specific deadlines for each of the required meetings provided in Canvas. These meeting should be during the professor's office hours or scheduled by appointment. The entire team is expected to attend these meeting with one miss being allowed per person.

**Progress Reports** **Due on Fridays at 11:59 pm, submitted through Canvas.** Progress reports should be clear and complete. Quality of technical writing is assessed. These are formal documents and should be thought of as sections of your final report. A required template for these reports is provided on Canvas.

1. **Report A: Problem Statement, Introduction to Client** (client information and mission), **and an initial Teamwork & Timing Plan** (including Team Contract and Gantt chart)

2. **Report B: Revised Problem Statement, Background (market research) and Concept selection (PDS, Pugh matrices)**
3. **Report C: Detailed design with purchase plan**
  - *Purchase request forms must be completed and signed for all purchases*
  - *Complete **signed** materials list, fabrication plans, and CAD drawings required before beginning any work in the shop*
4. **Report D: Fabrication report including design adaptations (with testing and installation plan)**

**Team Evaluations** At weeks 5, 9 and 14 peer evaluation must be completed by all students. **The evaluations will impact course grade.** Scores of 3, 4, and 5 indicate appropriate teamwork. Scores of 1 and 2 indicate poor team contribution. If you do not fill it out, or give everyone the same scores, your grade will be lowered.

The results of the peer assessments should be discussed in status reports and in the final report: as a team, how are teamwork issues being addressed? We will use the CATME ([www.CATME.org](http://www.CATME.org)) tool for assessing teamwork skills.

**Reflections** Two reflections on community-based learning are due during the semester. These questions will be posted and submitted to CANVAS.

**Final Product, Paper, Presentation** This grade will be determined by the (1) quality and quantity of the engineering work you have done this semester as presented in the final Design Paper, the (2) quality of the Design Paper itself, and the (3) quality of the communication of that work. It is expected that your final paper and product will be complete and submitted by **4/15/19**, with a grace period until 4/18/19 for final product delivery.

**Design Paper:**

This Design Paper should encapsulate your sophomore project work. This paper is a written document submitted before the end of the semester and should include:

- **Abstract** - maximum of 200 words
- **Introduction** - provide an overview of the project (problem statement) and your client and their mission
- **Project Management** - reflection on teamwork and time management in context of team contract, CATME results, and tools such as Gantt chart
- **Market Research** - material on what other people have done, what is on the market, and where your project fits in (research with citations).
- **Product Design Specifications** - quantified PDS and relative importance
- **Design** - section showing design problem, methodology, and results of design analyses. Design is an iterative process leading to a best design from numerous possible solutions. Decisions should be explained clearly and analytically (PDS, Pugh matrices, conceptual and detailed design, CAD).
- **Budget** - initial estimate of cost, final expenses, what changed.
- Documentation of the **Fabrication** process
- **Testing and installation** report with any **system documentation** for end user
- **Reflection on community engagement** - consider rewards, challenges, and lessons learned in working with community members.
- **Bibliography** - list of referenced material from research. Students should use a technical standard (find a technical journals submission requirements) for format, citations, and equations. For example, the IEEE standard can be found at: <https://iee-dataport.org/sites/default/files/analysis/27/IEEE%20Citation%20Guidelines.pdf>

**Final Presentation:**

The final presentation of your work will be a poster at Scholarship and Creative Arts Day (4/16/19). These public presentations should always be considered an abstract of your final written report, focusing on design highlights and outcomes. Posters must be submitted by 3/29/19 for compilation and printing.

## Ethics

Students are to act in accordance with the Pledge of Integrity as stated in the student handbook on all course assignments.

**I pledge to respect all members of the Elizabethtown College community, and to act as a responsible member of the College community. I pledge to respect the free exchange of ideas both inside and outside the classroom.**

I pledge to represent as my work only that which is indeed my own, refraining from all forms of lying, plagiarizing, cheating, and academic dishonesty. As members of the Elizabethtown College community, we hold each other responsible in the maintaining of these values.” – adopted in 2014 by Elizabethtown College students and faculty

Dishonest practice (for this course, primarily plagiarism including uncited sources) can result in failure of the course and possibly expulsion from the college.

### ***NSPE Code of Ethics Canons, with 2018-19 Elizabethtown College Student Professional Obligations***

- I. Hold paramount the safety, health, and welfare of fellow students.
- II. Perform project tasks and assignments only in the areas of their competence.
- III. Submit assignments only in an objective and truthful manner.
- IV. Act for team members, instructors, or employers as faithful agents or trustees.
- V. Avoid deceptive acts.
- VI. Conduct themselves responsibly, ethically, lawfully, and in line with the integrity policy so as to enhance the honor, reputation, and usefulness of the profession and college's engineering department.

### ***Professional Obligations of Elizabethtown College Engineering Students (written by class of 2021)***

*I. Engineering students shall be guided in all their relations by the highest standards of honesty and integrity.*

- A. Be honest about your mistakes.
- B. Do not cheat on exams or assignments.
- C. Do not plagiarize or falsify data.
- D. Do not aid or abet another student in unethical behavior.

*II. Engineers shall at all times strive to gain the knowledge to serve the public's interest.*

- A. Your goal in class should be to gain knowledge to justify your intended degree, not just to obtain a high grade.
- B. Work for the advancement of society and the profession by engaging in the community, and recruiting youth to the engineering profession.

C. Inform professors of unethical requests from other students.

*III. Engineers shall avoid all conduct or practice that deceives other students, instructors, or the public.*

- A. In lab work, be truthful with all data, even if it is not favorable.
- B. All assignments should be your own original work unless otherwise noted.
- C. Do not finish and submit team projects without the approval of all your other team members.

*IV. Engineers shall not disclose confidential information concerning their own group work to any person outside of their group except for the professor.*

- A. Do not put individual assignments in your public folder.
- B. Do not spread the word of quiz questions or unannounced assignments to others.
- C. Engineering students who are or have been a TA shall not disclose information about tests and grades of other students.
- D. Do not disclose or use information learned from the internships that have to do with processes, or techniques of production.

*V. Engineering students shall not be influenced in their scholastic duties by conflicting interests.*

- A. Do not attempt to receive a favorable grade or recommendation by establishing an unprofessional relationship with a professor.
- B. In peer assessments or as a TA, do not allow friendships or grades to sway judgment
- C. Do not attempt to gain favor in class or for assignments through flattery of professors.

*VI. Students should not attempt to gain advancement by downgrading other students' work or by other questionable methods.*

- A. Credit should be awarded where it is deserved when submitting group work.
- B. If another student does exceptional work, do not take credit for it if it is not your work.
- C. If another student is performing inadequate work, calmly confront them about it before addressing it to the professor.
- D. Students shall not sabotage the projects or advancements done by other students.
- E. Do not blame group members for their own behavior.
- F. Do not blame professors or staff for their grades.

*VII. Engineering students should not attempt to injure the reputation of the engineering department or the reputation of professors and engineers in the department.*

- A. If other engineering students are injuring the reputation of the department, you should inform the head of the department or the professor of their actions.
- B. Every student in the department's actions should coincide with the integrity policy of the college to avoid degrading the department.
- C. Students shall report malicious activities to the Head of the Engineering Department, or appropriate instructor. Yet, the student shall not tell others of the issue.

*VIII. Engineering students should accept personal responsibility for all of the work they do for the department and for their group.*

- A. Students shall act truthfully when accused of misconduct.
- B. Blame for violations of the integrity policy should not be placed on the department or professors, but rather on the individual who committed them.

C. Students should also accept the blame if their group submits unethical work because it is their responsibility to ensure any submission with their name on it is held to high ethical standards.

*IX. Engineering students shall give credit for engineering work to those to whom credit is due, and will recognize the proprietary interests of others.*

A. Students shall not steal programs or work from other engineers or students from the internet through illegal networks.

B. Students shall properly cite information in all manners of presentation such as research papers, essays, PowerPoints, etc.

**Disabilities Statement**

Elizabethtown College welcomes otherwise qualified students with disabilities to participate in all of its courses, programs, services, and activities. If you have a documented disability and would like to request accommodations in order to access course material, activities, or requirements, please contact the Director of Disability Services, Lynne Davies, by phone (361-1227) or e-mail [daviesl@etown.edu](mailto:daviesl@etown.edu). If your documentation meets the college's documentation guidelines, you will be given a letter from Disability Services for each of your professors. Students experiencing certain documented temporary conditions, such as post-concussive symptoms, may also qualify for temporary academic accommodations and adjustments. As early as possible in the semester, set up an appointment to meet with me, the instructor, to discuss the academic adjustments specified in your accommodations letter as they pertain to my class.

**School Closure Policy**

If the college is closed (i.e., for inclement weather), meetings with your team or instructor will be rescheduled. There is no formal meeting time. Since all work is assigned at the beginning of the semester and is turned in electronically, school closure will not affect deadlines.

**Religious Observances Policy**

The College is willing to accommodate individual religious beliefs and practices. It is your responsibility to meet with the class instructor in advance to request accommodation related to your religious observances that may conflict with this class, and to make appropriate plans to make up any missed work.

**Fine Print**

The above information represents the intent of the course, and is subject to change at the discretion of the instructors.