**FSE100 Design Project**

*“No profession unleashes the spirit of innovation like engineering. From research to real-world applications, engineers constantly discover how to improve our lives by creating bold new solutions that connect science to life in unexpected, forward-thinking ways. Few professions turn so many ideas into so many realities. Few have such a direct and positive effect on people’s everyday lives. We are counting on engineers and their imaginations to help us meet the needs of the 21st century.”*

*From National Academy of Engineering*[***Changing the Conversation: Messages for Improving Public Understanding of Engineering***](http://www.nap.edu/catalog.php?record_id=12187)*(2008)*

**Description**

As a Fulton engineering freshman, you are an engineer from day one. For the rest of the semester, you will have the opportunity to identify a need and come up with a solution that could create value, making our world a better place. You will have the freedom to choose the design problem you want to work on, however, your design problem must be related to the “theme” which is posted on Canvas. Ask instructor for approval of your project idea.

Your design problem must be challenging, and your solution should be innovative. No matter what design problem you will be working on, your design should be cost effective, and be aesthetically pleasing. For easy storage, your design must be able to be broken down such that it fits in the eSpace locker assigned to your team.

**Budget & Supplies**

Building materials can be purchased through the “Sparkyville Marketplace.” Various common materials (and some uncommon) are in stock and have prices associated with them. An inventory list will be provided to you. You could use materials outside the inventory. For materials you already own, you could estimate the price as half of its market price. For the materials you decide to purchase on your own, each team can spend at most $50. **Note this additional cost won’t be reimbursed.** You are encouraged to recycle waste materials, such as packaging materials including cardboard boxes and etc. For these materials, the cost can be counted as zero. You will have a maximum “budget” of $150 and all expenses must be tracked. Expenses for experimenting/prototyping and actual building the final model need to be tracked separately. The sum of both can’t exceed $150. Returns of materials in original condition will be accepted at Sparkyville Market at any time with no penalty. Tools, adhesives, and fasteners (screws, nails, bolts, etc.) will be available for use in lab during scheduled lab times free of charge. The project kit (including Redboard, programming cable, breadboard, sensors and etc.) and solar module that you “buy” from the Sparkyville Marketplace must be returned in their original condition at the end of the semester (you still need to take into account their cost though). Make sure they are easily removable from the rest of your prototype.

**Project Evaluation**

The project will be evaluated based on creativity, functionality, total cost of your design, and the aesthetics/craftsmanship. Your team will also be evaluated on the ability to clearly communicate your design/results in both oral and written form throughout the project.

Besides creating a functioning prototype of your design, your group will be required to provide various intermediate project deliverables throughout the project (See Project Grading Details in Table 1). All due dates are posted on Canvas. These intermediate deliverables are designed to aid you in working through the design process. You will be given handouts detailing what will be expected for each of these deliverables. In addition to written project deliverables, your team will also be expected to give two short oral presentations on your design as well as creating a short YouTube video.

You will be required to update your team design notebook Google Doc according to instructions. All project related documents will be posted on Canvas.

**Project Grading Details**

As stated above, you will have various deliverables which make up your project grade. Table 1 details how the grading of your project will be determined. **Individual grades will be based on the team’s grade and the individual’s contribution to the team (partially based on peer evaluations and instructor observation).** The total project grade will be weighted based on evidence of each individual’s participation as described above.

Table 1: Grading Details for the Project

|  |  |
| --- | --- |
| **Assignment** | **Points Available** |
| Project Deliverable 1: Project Proposal Presentation | 30 |
| Project Deliverable 2: Project Proposal Report | 50 |
| Project Deliverable 3: Final Presentation/Video  | 40 |
| Project Deliverable 4: Final Design Prototype  | 100 |
| Project Deliverable 5: Final Design Report | 80 |
| **Total** | **300** |

**All project deliverables are to be completed and submitted as a team and are due at the beginning of the lab time on the day they are due**. **Only one copy of each team deliverables needs to be submitted per team, with a cover page showing the names of team members working on the deliverable. If your name is not on it, you will automatically get a zero grade for the assignment.**

**Extra Credit Opportunities and Awards**

During the project demonstration near the end of the semester, all the designs will be voted by the whole class in different categories. Your team will earn extra credit if your design is voted the winner of any category shown in Table 2. Additional extra credits can be awarded based on the complexity of your design at the instructor’s discretion.

Table 2: Extra Credit Opportunities for the Project

|  |  |
| --- | --- |
| **Metric**  | **Points Earned** |
| Best Economic Value (as voted on by class/visitors) | 10 |
| Best Social Value (as voted on by class/visitors) | 10 |
| Most Creative/Innovative (as voted on by class/visitors) | 10 |
| Most Complex/Sophisticated (as voted on by class/visitors) | 10 |
| Best Craftsmanship and Aesthetics (as voted by class/visitors) | 10 |
| Grand Champion (highest votes out of all categories combined) | 10 |
| Extra effort (at instructor’s discretion) | 20 (max) |
| **Total Possible Bonus Points**  | **80** |