ENGI301: Project #1

Proposal Due: Monday 02/13/2023 11:59pm

Software Diagram Due: Monday 02/27/2023 11:59pm

Final Documentation Due: Friday 03/31/2023 11:59pm

Project Proposal

Goal: Create an embedded system that can be shared with the open source community.

This project is about creating an embedded system. It is entirely reasonable to trade hardware complexity for software complexity and vice versa. Projects should be scoped to take about 4 weeks of development time.

Project will consist of 3 parts:

1) **Proposal (30% - Due: Monday 02/13/2023 11:59pm)**:

Download *ENGI301_project_01_proposal.pptx* from Canvas. Change name of *ENGI301_project_01_proposal.pptx* to *<last_name>_ENGI301_project_01_proposal.pptx*. Fill out to capture your project proposal. Projects may leverage existing designs and software. However, there needs to be a clear presentation of differences / improvements / additions to an existing design from both a hardware and a software perspective.

When creating your proposal, all parts must be from either Amazon, Adafruit, Sparkfun, Digi-Key, or Mouser. Additionally, please select no more than two parts that are not on the ENGI301 parts list (Canvas → Files → assignments → ENGI301_project_01_parts_list.xlsx). Finally, the total cost of purchased parts for your project should not exceed $75. See the project proposal slide set for more information. If you have a special request, we can discuss.

In your ENGI301 github repository, create a folder "project_01". In the "project_01" folder, create a file called "README.md" and put the name of your project within an <h1> tag. Check the README.md file into the repository. In the "project_01" folder, create a "docs" folder. Check in *<last_name>_ENGI301_project_01_proposal.pptx* into the "docs" folder. Email welsh@rice.edu and erikwelsh@gmail.com before the assignment due date with a link to the github repository to turn it in. There will be individual meetings 02/15 – 02/16 to discuss project proposals to ensure proper scope. After the individual meetings, the proposal should be updated and checked in to your repository.

2) Software Framework (15% - Due: Monday 02/27/2023 11:59pm):

Create a Software Diagram and add it to your project proposal. The software block diagram should show how all user inputs and user outputs are handled by the software. It should show all the Python classes that will be created and the interface between them.

3) Implementation (15%):

Your projects should be implemented in Python or an agreed upon language on the PocketBeagle or agreed upon development board(s) surrounded with appropriate components. The project should autoboot on power up (we will cover how to do this in class later in the semester).

4) Documentation (40% - Due: Friday 03/31/2023 11:59pm):

Your project needs to be documented with the following information:

a) All implementation files should be checked in to github under the “project_01” directory and include proper headers / documentation.
b) README in github under the “project_01” directory with software build instructions, software operation instructions, and links to the Hackster.io page.
c) Project has a Hackster.io page that includes: a “story”, parts list, build instructions (including pictures), operation instructions, links to the github page and a video of the project.

You do not need to duplicate documentation between the github README and the Hackster page. The github README should focus on the software and the Hackster page should focus on the physical build of the project.

Everyone needs to bring their projects to class on Thursday 04/06.