ECE 3301 "Introduction to Microcontrollers" Project Requirement

1. **Project objective**

One of the major requirements for this course is a project that allow students to present their understanding of the course learning outcomes by controlling a real life application using microcontrollers. Each group can choose any application they are interested in and use microcontrollers to control one or more processes within this application.

2. **Project deliverables**

This is a hands-on project; students should provide the following deliverables by the end of the project:
   o   An assembled hardware demonstration of the application and the control system. The students should be able to demonstrate the control system of an application and the capabilities of the microcontroller to control different parameters of the system (e.g. sensors, actuators, temperature, and pressure).
   o   The source code of the control system program and identifying in the report the integrated development environment (IDE) used to develop the code.
   o   A project technical report presenting the project design, development, testing and running procedures according to the guidelines in section 5.

3. **Project types (These are examples and it is encouraged to come up with different project ideas)**

- Pressure control
- Temperature control
- Level Control
- Humidity control
- Charging system
- Autonomous RC control
- UAV control
- Game controller
- Valve controller

4. **Project proposal**

- A project proposal (Word format) is required to be submitted by the due date posted on the Blackboard.
- In the proposal, the following items should be included:
   o   Project Title
   o   Group Number
   o   Team Members
   o   Project Summary.
   o   Project Objectives

5. **Project report**

- The report (Word format) must be submitted by the due date posted on the Blackboard.
- The format of the report:
  - Minimum 12 and Maximum 15 pages are required.
  - Margins should be 1.25 inches left and right and 1 inch top and bottom.
  - Spacing should be single line. Page number is required.
  - The heading is upper case, at the left margin, and boldfaced. The text is below the heading at the left margin.
  - Text should be in a 12-point Times New Roman font and left-right alignment.
  - Tables and figures should be in a 12-point Times New Roman font, centered, and numbered sequentially and titled individually.
- The project report should include:
  - Title page
  - Abstract
  - Table of contents
  - Introduction (a summary of project objectives)
  - Experimental methodology
  - Experimental results
  - Summary of challenges and how they were solved
  - Conclusions
  - References
- Examples of the reference writing
  - Article or Chapter in an Edited Book
    Author, A. A., & Author, B. B. (Year of publication). Title of chapter. In A. A. Editor & B. B. Editor (Eds.), *Title of book* (pages of chapter). Location: Publisher.
  - Article in journal paginated by volume

  Harlow, H. F. (1983). Fundamentals for preparing psychology journal articles. *Journal of Comparative and Physiological Psychology, 55*, 893-896.
  - Article in a magazine
  Henry, W. A., III. (1990, April 9). Making the grade in today's schools. *Time, 135*, 28-31
  - Edited book with an author or authors
  Plath, S. (2000). *The unabridged journals.* K. V. Kukil (Ed.). New York, NY: Anchor.
  - Article from an online periodical
  Author, A. A., & Author, B. B. (Date of publication). Title of article. *Title of Online Periodical, volume number* (issue number if available). Retrieved from
  http://www.someaddress.com/full/url/
- Use IEEE format for references.
- The submitted report shall be a word document (.docx) or Latex document (.tex) associated with a PDF Latex output.
- Grading policy
  - The amount of work accomplished: 60%
  - The organization of the project report: 20%
  - The usefulness of the project and the degree of relation to real life applications: 20%

By following the above rules, the instructor has the right to grade students' report at his own discretion.