

Syllabus For ECE 309L

Course: Control System Laboratory

Instructor: Tarek Elsharhawy
Room: 9-327,
Email: taelsharhawy@cpp.edu

Office Phone: (909) 869-2551

Office Hours: Tuesday & Thursday (8:00 – 9:00 AM)
Monday & Wednesday (3:00 – 4:00 PM)

Textbook & References: Control System Engineering, by Norman S. Nise.
Project Handouts & Documents (Blackboard)

Prerequisite: ECE 309

General Procedures: *All CPP university policies, procedures and standards apply in regards (but not limited to) academic integrity, plagiarism, conduct, grading, etc.*

Course Description: DC motor rotational speed control (unloaded & loaded) project utilizing National Instrument myDAQ package and its associated Lab View software Package.

Recommended major hardware components list is as follows:

- | | |
|--|--------------|
| 1- Cylindrical brushed DC Gear motor with encoder. | (Students) |
| 2- Motor Control chip / driver. | (Students) |
| 3- NI myDAQ & associated software (Lab View Student Version) | (Instructor) |

The students in the lab will be divided into project groups. Each group shall consist of 2 (two) or more students. The group will assign tasks for each student during the course of the project as the group see appropriate. It is the responsibility of each student to familiarize himself/herself with all concepts of the project such as control system design, modeling, system development, system tuning and project management, etc.

I will have a brief verbal discussion “one on one” with each student regarding the weekly design task to determine each student’s compliance with the project schedule and tasks (participation grade).

Lab Documents

Lab documents (1-8) will be posted on blackboard according to proposed schedule described below. The lab procedure files will be one of the project reference materials. Students are not required to submit the pre-lab requirements indicated in these files. The only project submittals required are described in the “**Grading System & Proposed Schedule**” section in this document. However, it is each student’s responsibility to know the materials included in these documents including the pre-lab requirements.

Hardware

Recommended hardware component (Motor & Motor driver) will be posted on blackboard for each student’s reference. I strongly recommend that each group should not order any hardware component part until the group completes its design (System Schematics / Wiring Diagram).

Software

Lab documents (1-8) will be posted on blackboard according to proposed schedule described above. These documents will include various software modules and links to tutorials that should help each student to get familiar with lab view software. In addition, the final software files needed to run the control system project will be also posted on blackboard in due time.

Furthermore, it is the responsibility of each student to analyze the final software files and understand the functionality of each block thoroughly. This thorough software analysis and understanding will be discussed during my verbal discussions and will be part of the participation grade.

Grading System & Proposed Schedule:

- Participation Grade (Project Verbal discussions)		20 %
- System Block Diagram (Individual, Note 2)	Due Week 2	10 %
- System Schematics / Wiring Diagram (Note 1 &3)	Due Week 3	10 %
- System I/O Verifications (Note 1)	Due In Class Week 4	10 %
- Project Progress Report 1 (individual)	Due Week 4	0 %
- Project Setup / Start testing (Note 1)	Due In Class Week 5	10 %
- System Tuning Method 1	Due In Class Week 6	PG
- System Tuning Method 2	Due In Class Week 7	PG
- Project Progress Report 2 (individual)	Due Week 7	10%
- System Tuning Method 3	Due In Class Week 8	PG
- Project Final Demo (w/o Load & w/ Load), (Note 1)	Due In Class Week 9	10%
- Final Project Report (individual)	Due Week 10	10%
- Project Quiz	TBD	10%

* **Due Week X** : Indicates submittals are due 5:00 pm the calendar day prior to class session.

* **Due In Class Week X** : Indicates instructor's signature required by the end of class period.

* **PG** : Indicates Participation Grade.

Notes:

- 1- Collective presentation, individual submittal on blackboard.
- 2- Multiple attempts (2), last graded attempt will be used in grading; first attempt must be on time on order to qualify for the multiple attempt learning strategy.
- 3- Multiple attempts (4), last graded attempt will be used in grading; first attempt must be on time on order to qualify for the multiple attempt learning strategy.

Reports

The first progress report will not be recorded but will be graded and discussed collectively and individually. Then I will lecture on the report format required for this class for the second and third reports. Upon grading the second report, I will discuss each report with each student individually to provide individual guidance regarding the report. These reports will serve as the student reference during the quarter. By the end of the quarter, each student should be able to write a technical report according to the engineering industry acceptable standards.

Engineering Practices

As I have indicated verbally during my first meeting presentation, I will run the class like an engineering group. I will establish on blackboard under the **"Discussion Board"** item technical threads. This way we can all share and discuss various technical issues we may face and what technical solutions or suggestions we may have. I strongly suggest that we all utilize it.

I strongly recommend and encourage technical discussions regarding the project and assignments. However, I do expect that once the student is formalizing the assignments, he/she will do that individually.

In addition, this project resembles very closely the same project conducted during 309L the last few quarters. However, I have modified the software and the hardware slightly in a way that allows me to detect previous versions. Please be aware of any one trying to provide you with previous versions of project documents such as (but not limited to) block diagram, schematics, software, etc.