

### Instructor

Isuru Godage, Ph.D.

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### Lab Hours

Fr 3:00PM – 4:30PM Room 930 in CDM Building or via ZOOM

(<https://depaul.zoom.us/j/93214049676?pwd=L1B4a0tTNFhMaEREWWY5TjVxNHR5dz09>)

### Course Web Page

This syllabus, as well as the class lecture notes, homework assignments, and other links, are available on D2L. Please check the D2L news/discussion forum regularly.

### Course Description

This course, CSE 393, focuses on the development of a proposal and preliminary studies for building a cyber-physical system. The coursework starts with an exploration of the physical application context and an investigation of the problems in the area and possible solutions. Students, working in groups, will identify a specific problem to be solved or goal to be achieved via automation using a cyber-physical system and develop the system requirements. Through related literature reviews, students will then analyze the physical processes involved and develop mathematical models that describe them. These models are expected to be as sophisticated as possible (via modeling physical properties such as friction, damping, and processing and communication delays, etc.) to emulate the true nature of the processes. Utilizing these comprehensive numerical models, students will systematically develop the algorithms and design the control systems that empirically validate the solution of the problems or achievement of the desired goals. In most cases, students will also develop and validate prototypes of crucial subsystems of the proposed system design. The actual development, implementation, system integration of the design into a complete cyber-physical system will be achieved in the follow-up course, CSE 394.

### Course Objectives

In this course, students will:

- Students will apply particular concepts from readings, lectures, etc. to an analysis of lived experiences in the settings provided by the course
- Students will use the experiences provided by the course to construct and articulate the impact

of their experience on their understanding of course content

- Students will demonstrate an understanding of the ethics appropriate to their experiential settings
- Students will synthesize the ideas and experiences provided by the course to inform their personal, academic and/or professional pursuits and be able to articulate the process.

### Prerequisites:

Students must also have taken CSE 333 and CSE 352 (or Instructor approval). Also, students must have passed these courses or have been waived out of them. If you have any questions, refer to the Instructor.

### Important:

- This course is student-centric, project-based, and hands-on where students get to analyze, derive, simulate, implement, and test a complete cyber-physical system. Students are strongly advised to take part in the group activities and weekly discussions with the faculty member to report progress and sort out challenges.
- Projects are group activities. Each group has two/three members. Please find a group member by the end of the first meeting. Let the Instructor know if you have difficulties getting into a group before the second meeting.
- Once formed, you cannot change groups.
- Assignments should be completed individually.
- Students enrolled in this course will have access to CPSE lab. Please handle the equipment in the CPSE lab with care.

### Course Format

The course outlines the material you will need to understand the fundamental concepts covered during course, including:

- Meeting (1.5 hrs/week).
- Weekly lab and homework assignments.
- Resources such as videos, and code files via D2L.
- Self-Assessment resources on D2L, including lecture questions/answers, and unit quizzes/solutions, to assess your progress and understanding.

### Textbooks

**Engineering Ethics, concepts and cases, 6<sup>th</sup> Edition** by Charles E. Harris, Michael S. Pritchard, and Michael J. Rabins, 2018.

### Grading

The course grade is apportioned as follows:

- |                    |     |
|--------------------|-----|
| • Homework         | 35% |
| • Progress reports | 10% |

- Project report 50%
- Participation 5%

**Homework:** Homework (PDF version, no hard copies will be provided in class) will be available on D2L. Complete the homework and submit by the deadline indicated in the assignment. Homework involves reading the chapters specified by the advisor and completing the writing assignments indicated.

**Progress reports:** The groups are expected to upload reports that outline the weekly progress on the project. The report should detail the type of progress with evidence (simulation results, pictures etc.) and the challenges faced and how they were overcome. The reports have to be uploaded on D2L before the weekly meeting with the faculty advisor. The template for lab reports is available on D2L.

**Final report:** The students are expected to submit a project report that details the progress throughout the course. The template for lab reports is available on D2L.

**Participation:** Your participation in the weekly meetings will be considered for participation. In addition, individual contribution, continued progress toward the final project (via weekly progress reports) will also play a part in this category.

The grading rubric for normalized marks:

A	A-	B+	B	B-	C+
95-100	91-94	88-90	85-87	81-84	77-80
C	C-	D+	D	F	I
73-76	69-72	65-68	61-64	0-60	*

\* **Incomplete:** An incomplete grade is given only for an exceptional reason such as a death in the family, a severe illness, etc. Any such reason must be documented. Any incomplete request must be made at least two weeks before the final and approved by the Dean of CDM. Any consequences resulting from a poor grade for the course will not be considered as valid reasons for such a request.

**To do well in this course:** To do well in this course, the student is expected to work 8-10 hours a week on the project. You should meet the advisor on a weekly basis and continuously make progress towards your final project. It is essential that you sort out any challenges you are facing immediately during weekly meetings by talking to the Instructor promptly if you have any problems.

## Policies

### **Deadlines for adds, drops, and withdraws**

See the deadlines in <https://www.depaul.edu/university-catalog/academic-handbooks/undergraduate/university-information/Pages/academic-calendar.aspx>

## **Changes to Syllabus**

This syllabus is subject to change as necessary during the quarter. If a change occurs, it will be thoroughly addressed during class, posted under Announcements in D2L and sent via email.

## **Online Course Evaluations**

Evaluations are a way for students to provide valuable feedback regarding their Instructor and the course. Detailed feedback will enable the Instructor to continuously tailor teaching methods and course content to meet the learning goals of the course and the academic needs of the students. They are a requirement of the course and are critical to continue to provide students with the highest quality of teaching. The evaluations are anonymous; the Instructor and administration do not track who entered what responses. A program is used to check if the student completed the evaluations, but the evaluation is separate from the student's identity. Since 100% participation is our goal, students are sent periodic reminders over three weeks. Students do not receive reminders once they complete the evaluation. Students complete the evaluation online in [CampusConnect](#).

## **Academic Integrity and Plagiarism**

This course will be subject to the university's academic integrity policy; the following is an excerpt from the policy. More information is available at <http://academicintegrity.depaul.edu/>. If you have any questions, be sure to consult with the Instructor.

## **Academic Policies**

All students are required to manage their class schedules each term in accordance with the deadlines for enrolling and withdrawing, as indicated in the University Academic Calendar. Information on enrollment, withdrawal, grading, and incompletes can be found at <http://www.cdm.depaul.edu/Current%20Students/Pages/PoliciesandProcedures.aspx>

## **Students with Disabilities**

Students who feel they may need an accommodation based on the impact of a disability should contact me in private as early as possible in the quarter (preferably within the first week of class), to discuss their specific needs, and make sure that you have contacted the [Center for Students with Disabilities \(CSD\)](#). All discussions will remain confidential.