System Dynamics (#3333158-97)

(Grad-Level Course / Fall Term)

Instructor

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Course Description

- The main objective of this course is to understand how to model a multi-domain dynamic system.
- Bond graph method is employed for modeling purposes + 20Sim software for simulations.

Textbook

- D. Karnopp, D. Margolis, R. Rosenberg, *System Dynamics: Modeling, Simulation, and Control of Mechatronics Systems*, 5th Ed., Wiley, 2012.

Evaluation & Grading

- Final Exam (in-class) (%40)
- Project (%40)
- Assignment (%20)

Syllabus

#	Topic
1	Introduction to Dynamical Systems
2	Multiport System & Bond Graph
3	Bond Graph Elements
4	Multi-domain System Modeling
5	State Space Representation
6	20SIM Software Training
7	Multiport Fields & Junction Structures
8	Mechanical system with nonlinear geometry
9	Thermo-fluid System & Pseudo Bond Graph
10	Energy-based Model Order Reduction
11	Project Presentation
12	Final exam