

Course Outline
SE 420: Digital Control Systems
Term: Fall 2026

Instructor: Dušan M. Stipanović

Lectures: Tuesdays and Thursdays 8.00-9:20am in 206 Transportation Building and via Canvas

Office hours: Tuesdays 9:20am-10:20am in 105 Transportation Building and via Zoom

Email: dusan@illinois.edu

Phone: 217-244-0907

Course material: Canvas (<https://canvas.illinois.edu>)

Lab Instructor: Daniel J. Block

Email: d-block@illinois.edu

Lab location and hours: 3075 ECE Building, MW 2:00-4:50pm

Teaching Assistant: Abbas Bataleblu

Email: abbasb2@illinois.edu

Text: *Lecture Notes* are available in pdf via Canvas (<https://canvas.illinois.edu>).

Topics:

- Introductory Digital Control
- Discrete Systems Analysis
- Sampled-Data Systems
- Discrete Equivalents
- Design Using Transform Techniques
- Design Using State-Space Methods
- Discrete-Time Systems: Special Topics related to training of Neural Networks and Machine Learning. Supplemental material for this topic is the book “*Difference Equations and Machine Learning*.” This book can be downloaded for free from this link: <https://link.springer.com/book/10.1007/978-3-032-00910-4>

Grade composition (subject to changes):

- One midterm exam on Thursday 10/15/2026, 15%.
- Final exam: 30%.
- Homework assignments: 35%.
- Lab assignments: 20%.

General information: Each lecture will be recorded and posted on Canvas. OneNote lecture notes will be created in OneNote and posted on Canvas (in addition to the lecture notes). Homework will be assigned every other week. Late assignment submissions will not be accepted, in general.