ECE 356 Syllabus
Systems and Control
Fall 2014

Instructor: Dr. Sareh Taebi
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Office Phone: 618-453-7034

Credits and contact hours: 3 credits, three 50-minute sessions per week
Office Hours: M-W-F; 3:00-4:50 pm; and/or by appointment
Lecture: ENGR A-420; MWF, 2:00 – 2:50 pm

Prerequisites: ECE-315 and ECE-355

TA: Nasibe Zohrabi
TA Email: zohrabi@siu.edu

1- Course Description:

Introduction: This course introduces important concepts in the analysis and design of control systems. The students are expected to have fulfilled the following prerequisites: introductory courses on differential equations, Laplace transforms, vector matrix analysis, circuit analysis, and mechanics. Control theories commonly used today are classical control theory (also called conventional control theory), modern control theory, and robust control theory. This course presents comprehensive treatments of the analysis and design of control systems based on the classical control theory and modern control theory.

Outline and goals of the course: This course is organized into 9 chapters. The outline of each chapter is summarized as follows:

- Chapter 1: Presents an introduction to the control engineering.
- Chapter 2: Deals with mathematical modeling of control systems that are described by linear differential equations.
- Chapter 3: State-space expressions of differential equation systems are derived.
- Chapter 4: Characteristics of feedback Control Systems are derived.
- Chapter 5: The performance of feedback control systems are analyzed.
- Chapter 6: Presents stability analysis based on Routh’s stability criterion and the Hurwitz stability criterion is briefly discussed.
- Chapter 7: Treats the root-locus method of analysis and design of control systems. Details of the design of control systems using lead compensators, lag compensators, are lag–lead compensators are presented in this chapter.
- Chapter 8: Presents the frequency-response method of analysis and design of control systems.
- Chapter 9: Discusses PID controllers and modified ones such as multidegrees-of-freedom PID controllers. The PID controller has three parameters; proportional gain, integral gain, and derivative gain.
2- **Text book(s), title, author, and year:**

**References or other supplemental materials:**

3- **Grading/Evaluation:**

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<thead>
<tr>
<th>Important Information</th>
<th>Max. Grades</th>
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<tbody>
<tr>
<td>Midterm tests</td>
<td>25%</td>
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<tr>
<td>Final</td>
<td>35%</td>
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<tr>
<td>Homeworks</td>
<td>25%</td>
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<tr>
<td>Quiz+Attendance</td>
<td>15%</td>
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<td>Total:</td>
<td>100%</td>
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**Final Grades Policy:**
- **A:** 88 - 100%
- **B:** 78 - 87%
- **C:** 68 - 77%
- **D:** 58 - 67%
- **F:** 0 - 57%

4- **Classroom and Exams Policies:**

A. **Attendance Policy:** Attendance will be taken at random throughout the semester, and it will be counted toward the final grade. Students are responsible for all announcements made in class and/or posted to D2L.

B. **Late Homework/Missed Exams:** Late homework will be accepted under certain conditions. If an exam is missed for a legitimate reason, a grade will be assigned based on the remaining homework/exams.

C. **Mobile Technology Policy:** All devices in a student’s possession should be set so that they will not cause a disturbance within the classroom. During an exam or quiz, students may not use any device with communication abilities.