California State University, Chico  
Department of Mechanical and Mechatronic Engineering and Advanced Manufacturing  

Fall 2020  
MECA 482: Control System Design  

Instructors: Serkan Inceoglu, PhD  
sinceoglu@csuchico.edu  

Lectures:  
Section 2: MWF 1-1:50 pm  
Zoom Link: Check the Blackboard page for the link  

Student Hours:  
Friday 2-3 pm  
Zoom Link:  
https://csuchico.zoom.us/j/91540043660?pwd=QVU3OUNqSU9XbDVzQjNtRFlloaXRVdz09  

Prerequisites  
EECE 211, MATH 260. Recommended: MECA 380, MECH 320; either CSCI 111 or MECH 208  

Course Usage of Blackboard Learn  
The course syllabus and other material will be posted on Blackboard Learn. You are responsible for regularly checking the online resources, which is accessed through the Chico State Portal.  

Course Objectives  
1. Learn to specify performance criteria for control systems  
2. Design controllers to meet specifications  

Course Outcomes  
1. Apply Laplace transforms to solve differential equations  
2. Model mechanical and electrical components  
3. Convert models from time domain to frequency domain  
4. Convert models from time domain to state space form  
5. Convert from state space representation to transfer function representation  
6. Apply Mason’s rule to create a single-input-single-output representation of a system  
7. Apply Laplace transformation technique to perform time response analysis of a system  
8. Perform stability analysis of a system  
9. Perform Root Locus analysis of a system  
10. Perform frequency response analysis of a system
Textbook

Assignments and Grading
*Tentative rubric is as follows:*
Attendance, Conduct, and Participation (10%)
Quiz (20%)
Homework (20%)
Midterm (25%)
Final Exam (25%)

Late Homework Submissions
Homework submission made up to two days past due are considered late and will not be graded on full grade. Any submission thereafter will not be accepted.

Makeup exam
Unless it is about a serious health problem, no excuse will be accepted for a makeup exam. If you miss an exam/homework due to legitimate reasons (health, accident, etc), you need to let me know immediately and provide a supporting document for requesting a makeup. There is no guarantee that makeup exam will be the same in rigor as the original exam.

Course Topics / Tentative Schedule

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<th>Week</th>
<th>Date</th>
<th>Topic</th>
<th>Chapters</th>
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<tr>
<td>Week 1</td>
<td>08/24 - 08/28</td>
<td>Introduction</td>
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<td>Week 2</td>
<td>08/31 - 09/04</td>
<td>Modeling in Frequency Domain</td>
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<td>Week 3</td>
<td>09/07 - 09/11</td>
<td>Modeling in Frequency Domain (9/7 Labor Day - No Class)</td>
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<td>Week 4</td>
<td>09/14 - 09/18</td>
<td>Modeling in Time Domain</td>
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<td>Week 5</td>
<td>09/21 - 09/25</td>
<td>Modeling in Time Domain</td>
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<td>Week 6</td>
<td>09/28 - 10/02</td>
<td>Review &amp; Midterm 1</td>
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<td>Week 7</td>
<td>10/05 - 10/09</td>
<td>Time Response</td>
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<tr>
<td>Week 8</td>
<td>10/12 - 10/16</td>
<td>Time Response</td>
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<td>Week 9</td>
<td>10/19 - 10/23</td>
<td>Reduction of Multiple Subsystems</td>
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<td>Week 10</td>
<td>10/26 - 10/30</td>
<td>Stability (11/11 Veterans Day - No Class)</td>
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<td>Week 11</td>
<td>11/02 - 11/06</td>
<td>Steady-State Error</td>
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<td>Week 12</td>
<td>11/09 - 11/13</td>
<td>Root Locus Techniques</td>
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<td>Week 13</td>
<td>11/16 - 11/20</td>
<td>Review &amp; Midterm 2</td>
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<td>Week 14</td>
<td>11/23 - 11/27</td>
<td>Thanksgiving Break</td>
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<td>Week 15</td>
<td>11/30 - 12/04</td>
<td>Frequency Response Techniques</td>
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<td>Week 16</td>
<td>12/07 - 12/11</td>
<td>Dead week</td>
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<td>Week 17</td>
<td>12/14 - 12/18</td>
<td>Final Exam</td>
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Virtual Lectures and Exams: All lectures and exams will be online via Zoom. It is important that all students participate the discussions. I highly recommend that you turn your camera on during the lecture. During exams, all students will have to turn their cameras on and position it such that your honest and proper conduct can be documented.

Dropping and Adding
Students are responsible for understanding the policies and procedures about add/drops, academic renewal, etc., found in the CSU Chico University Catalog. You should be aware of the new deadlines and penalties for adding and dropping classes.

Classroom Protocol
During class, please do not engage in any activities that are not related to the class, e.g. personal web surfing, online shopping, e-mail, Facebook, etc.

University Policies and Campus Resources

Academic Integrity
Students are expected to be familiar with the University's Academic Integrity Policy. Your own commitment to learning, as evidenced by your enrollment at California State University, Chico, and the University's Academic Integrity Policy requires you to be honest in all your academic course work. Faculty members are required to report all infractions to the Office of Student Judicial Affairs (Office of Student Conduct, Rights & Responsibilities). The policy on academic integrity and other resources related to student conduct can be found on the Student Judicial Affairs (Office of Student Conduct, Rights & Responsibilities) web site.

Student Services
Student services are designed to assist students in the development of their full academic potential and to motivate them to become self-directed learners. Students can find support for services such as skills assessment, individual or group tutorials, subject advising, learning assistance, summer academic preparation and basic skills development. Student services information can be found on the current students page of the CSU Chico web site.

Americans with Disabilities Act
If you need course adaptations or accommodations because of a disability or chronic illness, or if you need to make special arrangements in case the building must be evacuated, please make an appointment with me as soon as possible, or see me during office hours. Please also contact Accessibility Resource Center (ARC) as they are the designated department responsible for approving and coordinating reasonable accommodations and services for students with disabilities. ARC will help you understand your rights and responsibilities under the Americans with Disabilities Act and provide you further assistance with requesting and arranging accommodations.

Accessibility Resource Center
530-898-5959, Student Services Center 170, arcdept@csuchico.edu
Student Learning Center
The mission of the Student Learning Center (SLC) is to provide services that will assist CSU, Chico students to become independent learners. The SLC prepares and supports students in their college course work by offering a variety of programs and resources to meet student needs. The SLC facilitates the academic transition and retention of students from high schools and community colleges by providing study strategy information, content subject tutoring, and supplemental instruction. The University Writing Center has been combined with the Student Learning Center. You can also visit the Student Learning Center web site.