

## ECE421 Spring 2011

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Textbook: Modern Control Engineering, 5th Edition, K. Ogata, Prentice  
Hall, 2010, Chapters 1,2, 5 - 7.

1:30-2:45 Tuesday and Thursday, Rm 2053 David King Hall

1. Tuesday Jan. 25 Introduction 1
2. Thursday Jan 27 Introduction and Block diagrams 1, 2
3. Tuesday Feb 1 First-order systems 5
4. Thursday Feb 3 Block diagrams 2
5. Tuesday Feb 8 Second-order systems 5
6. Thursday Feb 10 Second-order systems 5
7. Tuesday Feb 15 Second-order systems 5
8. Thursday Feb 17 Types of control actions 5
9. Tuesday Feb 22 Stability analysis with the Routh array 5
10. Thursday Feb 24 Steady-state error 5
11. Tuesday Mar 1 Steady-state error 5
12. Thursday Mar 3 Test 1, Chapters 1, 2, and 5
13. Tuesday Mar 8 Introduction to pole movement, the root locus 6
14. Thursday Mar 10 Root locus 6
15. Tuesday Mar 22 Root locus 6
16. Thursday Mar 24 Introduction to compensator design 6
17. Tuesday Mar 29 Compensator design using root locus 6
18. Thursday Mar 31 Compensator design using root locus 6
19. Tuesday April 5 Compensator design using root locus 6
20. Thursday April 7 Polar plots and the Nyquist stability criterion 7
21. Tuesday April 12 Review of Bode plots 7
22. Thursday April 14 Test 2 Chapters 6 and 7
23. Tuesday April 19 Relative stability, gain and phase margins 7
24. Thursday April 21 Gain and phase margins 7
25. Tuesday April 26 Compensator design using Bode plots, phase lag 7
26. Thursday April 28 Compensator, complete phase lag, begin phase lead 7
27. Tuesday May 3 Compensator design, complete phase lead 7
28. Thursday May 5 Compensator design, phase lead-lag combination 7

Final Exam Thursday May 12, 1:30 to 4:15 am,  
Office Hrs Tuesday 12:00 to 1:15 and Wednesday 4:5:15

## **HOMEWORKS and Due Dates**

1. Tuesday Feb 1 B 2.4
2. Tuesday Feb 8 B 2.1, 2.2, 2.3, 5.1
3. Tuesday Feb 15 B 5.2, 5.3, 5.5, 5.9, 5.12, 5.13
4. Tuesday Feb 22 B 5.15, 5.20, 5.21, 5.22, 5.23, 5.24
5. Tuesday Mar 1 B 5.26, 5.27, 5.28
6. Tuesday Mar 8 B 6.1, 6.2, 6.5, 6.6
7. Tuesday Mar 22 B 6.11, 6.12a, 6.14, 6.18
8. Tuesday Mar 29 B 6.19, 6.20
9. Tuesday April 5 B 6.21, 6.23, 6.28
10. Tuesday April 12 B 7.16, 7.18, 7.24, 7.25
11. Tuesday April 19 B 7.31, 7.34
12. Tuesday April 26 B 7.33, 7.34

For project 1 assignments, go to [ece.gmu.edu](http://ece.gmu.edu), then click on people, faculty by name, then click on Guy Beale under faculty emiriti, then syllabi from previous semesters, then Spring '06, ECE421, finally projects.

## **Important Dates**

Thursday Mar 3 Test 1  
Thursday, Mar 24 Project 1  
Thursday, Apr 14, Test 2  
Thursday Apr 28, Project 2  
Thursday May 12, Final Exam

## **Grading**

Test 1	25%
Test 2	25%
Homework	10%
Project 1	5%
Project 2	5%
Exam	30%