Microwave Engineering II  
University of Massachusetts Amherst  
ECE 585

Instructor  
Do-Hoon Kwon  
Electrical and Computer Engineering  
University of Massachusetts  
Amherst, MA 01003  
Telephone: (413) 545-3851  
dhkwon@ecs.umass.edu

Office Hours  
Tu, Th 2:15–3:00PM and by appointment

Course Objectives
In this course, students should acquire the following skills. He/She should be able to:
1. Understand the theoretical principles underlying microwave devices and networks
2. Design microwave components such as power dividers, hybrid junctions, microwave filters, ferrite devices, and single-stage microwave transistor amplifiers
3. Improve skills in written communication, through a project report
4. Understand and quantify the effects of noise characteristics of microwave systems
5. Quantify the signal and noise characteristics of microwave systems, and relate them to the design process

Prerequisites
ECE 584, Microwave Engineering I or equivalent

Teaching Assistant
Mauricio Sanchez-Barbetty, msanchez@ecs.umass.edu (Office Hour: 1:00–2:00PM on Mondays at Marcus 5E)

Course Website
http://www.ecs.umass.edu/ece585

Textbook

References

Course Requirements
Graded homeworks, one CAD filter design project, one midterm exam, and a final exam.
Grading Policy

- Homework: 20%
- Filter Design Project: 10%
- Midterm Exam: 35%
- Final Exam: 35%

Homework assignments are due at the beginning of the class period on the due date. Late homeworks will NOT be accepted.

Course Topics
1. Power dividers, directional couplers (Ch. 7) [6 lectures]
2. Microwave filters (Ch. 8) [8 lectures]
3. Ferrimagnetic components (Ch. 9) [5 lectures]
4. Noise and distortion (Ch. 10) [5 lectures]
5. Amplifier basics (Ch. 11) [4 lectures]

Computer Requirements
Computer tools may be used for design problems in homework assignments. Ansoft Designer SV (http://www.ansoft.com/ansoftdesignersv), AWR Microwave Office, or any other equivalent microwave software package may be used.

Program Outcomes
For undergraduate majors taking this course, the five objectives are related in part to ten broad capabilities (ABET Program Outcomes) that we expect for all our BS graduates in the EE and CSE programs. These are related as shown in the table below.

<table>
<thead>
<tr>
<th>Program Outcomes</th>
<th>Course Objective</th>
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<tbody>
<tr>
<td>1. Well grounded in the fundamental concepts of mathematics, physics, chemistry, computer science, and engineering science</td>
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<tr>
<td>2. Able to identify, formulate, and solve problems in ECE</td>
<td>Y Y Y Y Y</td>
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<td>3. Able to design and conduct experiments, and to analyze and interpret measured data</td>
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<td>4. Capable of designing analog and digital systems, components, and processes to meet desired needs</td>
<td>N Y N N Y</td>
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<td>5. Proficient in using modern engineering techniques and computing tools for engineering practice</td>
<td>N Y N N N</td>
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<tr>
<td>6. Experience in engineering teamwork and in solving technically diverse problems</td>
<td>N N N N Y</td>
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<td>7. Able to communicate effectively orally and in writing, and through symbolic and graphical expression</td>
<td>N N Y N N</td>
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<td>8. Aware of professional and ethical responsibilities as engineers</td>
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<td>9. Aware of the impact of ECE technology and decisions on society</td>
<td>N N N N Y</td>
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<td>10. Motivated about the importance of lifelong learning and professional development</td>
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