ELEC 67B Course Outline as of Fall 2009

CATALOG INFORMATION

Dept and Nbr: ELEC 67B   Title: ADVANCED MICROWAVE
Full Title: Advanced Microwave Systems and Devices
Last Reviewed: 11/5/1997

Units		Course Hours per Week		Nbr of Weeks	Course Hours Total	
Maximum	4.00	Lecture Scheduled	3.00	17.5	Lecture Scheduled	52.50
Minimum	4.00	Lab Scheduled	2.00	10	Lab Scheduled	35.00
		Contact DHR	1.00		Contact DHR	17.50
		Contact Total	6.00		Contact Total	105.00
		Non-contact DHR	0		Non-contact DHR	0

Total Out of Class Hours: 105.00   Total Student Learning Hours: 210.00

Title 5 Category: AA Degree Applicable
Grading: Grade Only
Repeatability: 00 - Two Repeats if Grade was D, F, NC, or NP
Also Listed As:
Formerly:

Catalog Description:
Continuation of Elec 67A with emphasis on Swept Frequency Techniques, Spectral Analysis, and Modern Microwave devices and practice including GasFET, HEMT, and YIG circuits.

Prerequisites/Corequisites:
Course Completion of ELEC 167 (or ELEC 67A)

Recommended Preparation:

Limits on Enrollment:

Schedule of Classes Information:
Description: Continuation of 67A with emphasis on Swept Frequency Techniques, Spectral Analysis & Modern Microwave devices & practice including GasFET, HEMT & YIG circuits. (Grade Only)
Prerequisites/Corequisites: Course Completion of ELEC 167 (or ELEC 67A)
Recommended:
Limits on Enrollment:
Transfer Credit:

Repeatability: Two Repeats if Grade was D, F, NC, or NP

ARTICULATION, MAJOR, and CERTIFICATION INFORMATION:

AS Degree:	**Area**	Effective:	Inactive:
CSU GE:	**Transfer Area**	Effective:	Inactive:
IGETC:	**Transfer Area**	Effective:	Inactive:

CSU Transfer: Effective: Inactive:

UC Transfer: Effective: Inactive:

CID:

Certificate/Major Applicable:
Certificate Applicable Course

COURSE CONTENT

Outcomes and Objectives:
  The student will be able to:
1. make repeatable swept frequency measurements of SWR, IL, & Gain.
2. identify and repair common microwave system problems.
3. construct microwave circuitry.
4. calculate noise temperature, noise figure, & signal to noise ratios.
5. define "S" parameters.
6. demonstrate system faults using a TDR.
7. align, track, and calculate microwave antenna system performance.
8. calculate communication system performance.
9. identify the operation of GasFET's, HEMT's, IMPATT's & YIG devices and current devices.
10. use a network analyzer and service monitor.

Topics and Scope:

1. Swept frequency measurement, theory and techniques.
2. Swept power sources.
3. Passive microwave components.
4. Insertion loss & gain measurements.
5. TIME domain reflectometry.
6. VSWR & return loss measurements.
7. "S" parameters.
8. Attenuators, couplers & pads.
9. Network analysis theory & techniques.
10. STRIPLINE, microstriplines, co planer lines & slot lines.
11. Controlled electron microwave devices.
12. Solid state microwave devices:

    a. GAS Fet's HEMT's, GUNNDIODES, IMPATT'S, Transistor Oscillators, Amplifiers, and YIG circuits.
13. Spectral analysis theory and techniques.
14. Noise effects and measurements.
15. Waveguide vs coaxial systems in microwave work systems:
    a. low noise microwave amplifiers
    b. radar & pulse modulated systems
    c. point to point communication systems
    d. satellite communication systems
16. Microwave antenna systems.
LABORATORY WORK:
1. SWEPT frequency insertion loss measurements.
2. SWEPT frequency SWR & return loss measurements.
3. Time domain reflectometry.
4. Precision measurements & repeatability.
5. Spectral analysis, methods, & equipment.
6. SWEPT frequency gain measurements.
7. Microwave construction techniques.
8. Microwave oscillator evaluation.
9. Low noise amplifier evaluation, gain, B.W. operational adjustments.
10. Connector installation techniques & testing.
11. Antenna gain measurement techniques.
12. Satellite system alignments & dish tracking.
13. Radar systems.
14. Micro electronic microwave techniques.

Assignment:

Homework and other exercises from text manual.

Methods of Evaluation/Basis of Grade:

Writing: Assessment tools that demonstrate writing skills and/or require students to select, organize and explain ideas in writing.

None, This is a degree applicable course but assessment tools based on writing are not included because problem solving assessments are more appropriate for this course.	Writing 0 - 0%

Problem Solving: Assessment tools, other than exams, that demonstrate competence in computational or non-computational problem solving skills.

Homework problems, Lab reports, Quizzes, Exams	Problem solving 20 - 40%

Skill Demonstrations: All skill-based and physical demonstrations used for assessment purposes including skill performance exams.

Class performances, Performance exams		Skill Demonstrations 10 - 30%

Exams: All forms of formal testing, other than skill performance exams.

Multiple choice, True/false, Matching items, Completion		Exams 35 - 60%

Other: Includes any assessment tools that do not logically fit into the above categories.

None		Other Category 0 - 0%

Representative Textbooks and Materials:
INTRODUCTION TO MICROWAVE TECHNOLOGY by Monaco.