

**ELEC 67A Course Outline as of Fall 2004****CATALOG INFORMATION**

Dept and Nbr: ELEC 67A Title: MICROWAVE COMMUNICATIONS

Full Title: Microwave Communications

Last Reviewed: 3/9/2020

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	6	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:**

An introductory course in theory and practice of transmission lines, microwave devices, and microwave circuits. Included is basic use of Smith Chart solutions of transmission line problems. Laboratory work includes the operation of slotted lines, power meters, attenuators, standing wave meters, chart recorders and basic single frequency power and voltage standing wave ratio (VSWR) measurement techniques.

**Prerequisites/Corequisites:**

Course Completion of ELEC 61 OR Course Completion of ELEC 71B

**Recommended Preparation:****Limits on Enrollment:****Schedule of Classes Information:**

Description: Introduction to theory and practice of microwave transmission lines, devices, and circuits. Course includes basic use of Smith Chart solutions of transmission line problems. (Grade Only)

Prerequisites/Corequisites: Course Completion of ELEC 61 OR Course Completion of ELEC

71B

Recommended:

Limits on Enrollment:

Transfer Credit: CSU;

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

## **ARTICULATION, MAJOR, and CERTIFICATION INFORMATION:**

<b>AS Degree:</b>	<b>Area</b>			Effective:	Inactive:
<b>CSU GE:</b>	<b>Transfer Area</b>			Effective:	Inactive:
<b>IGETC:</b>	<b>Transfer Area</b>			Effective:	Inactive:
<b>CSU Transfer:</b>	Transferable	Effective:	Fall 1981	Inactive:	Fall 2009
<b>UC Transfer:</b>		Effective:		Inactive:	

**CID:**

**Certificate/Major Applicable:**

Certificate Applicable Course

## **COURSE CONTENT**

### **Outcomes and Objectives:**

Upon completion of this course the student will be able to:

1. Analyze microwave systems through the use of Smith Charts.
2. Construct wave guides and microwave transmission lines.
3. Measure various microwave parameters such as VSWR (voltage standing wave ratio), power and transit time.
4. Identify characteristics and equipment used in microwave circuits.
5. Correctly use various types of microwave equipment, such as slotted lines, frequency meters, slide screw tuners, and directional couplers.

### **Topics and Scope:**

- I. Fundamentals of processing frequencies located in the microwave spectrum
  - A. Measurement of microwave transit times
  - B. Signal generators such as Klystrons
  - C. Construction and use of microwave transmission lines
  - D. Construction, mechanical integrity and use of wave guides
  - E. Various antenna systems
- II. Theory, Maintenance, and Use of microwave test and measurement equipment
  - A. VSWR meter
    1. applications
    2. how to use
  - B. Power meter
    1. applications
    2. how to use

### C. Smith Charts

1. as a recording device for microwave data and parameters
2. how to use

### D. Frequency meters

1. applications
2. how to use

### Assignment:

1. Textbook reading, 20 pages per week.
2. Collect, analyze, and validate data against spec sheets and by calculations.
3. Write lab reports.
4. Skill demonstrations, including hookup of circuitry and equipment based on specifications.
5. Use Smith Charts to record microwave data and parameters.
6. Quizzes (2-4); midterm and final exam, including evaluation of hands-on activities.

### 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

Problem solving  
15 - 30%

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

Class performances, Performance exams, Evaluation of hands-on activities (performance).

Skill Demonstrations  
15 - 30%

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

Short answer.

Exams  
40 - 70%

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

None

Other Category  
0 - 0%

**Representative Textbooks and Materials:**

Microwave Radio Transmission Design Guide. Artech House Microwave Library, 1999.