

Administrative Master Syllabus

Course Information

Course Title	Solid State Circuits
Course Prefix, Num. and Title	CETT 1341 - Solid State Circuits
Division	Technology & Business
Department	Electronics Engineering Technology
Course Type	WECM Course
Course Catalog Description	A study of various semiconductor devices incorporated in circuits and their applications. Emphasis on circuit construction, measurements, and analysis. Multistage transistor amplifiers, common collector circuits, power amplifiers, amplifier class A, B, and C configurations, FET circuits, thyristors, amplifier frequency response, and basic linear operational amplifier circuits.
Pre-Requisites	Credit for CETT 1429
Co-Requisites	None

Semester Credit Hours

Total Semester Credit Hours (SCH): Lecture Hours:	3:3:1
Lab/Other Hours	
Equated Pay Hours	3.5
Lab/Other Hours Breakdown: Lab Hours	1
Lab/Other Hours Breakdown: Clinical Hours	0
Lab/Other Hours Breakdown: Practicum Hours	0
Other Hours Breakdown	0

Approval Signatures

Title	Signature	Date
Division Chair:	David Kucera, Technology & Business Division Chair	08-01-2023

Additional Course Information

Topical Outline: Each offering of this course must include the following topics (be sure to include information regarding lab, practicum, and clinical or other non-lecture instruction).

The following performance will be expected of any student completing this course with a passing grade. There is no absolute time limit on the performance of these objectives, unless noted, but the grade received by the student will depend, in part, on the relative speed and precision of the student's performance in these tasks. Where subjective evaluations are indicated, the instructor will make these judgments based on his or her knowledge of the skills required to place a graduate with the expectation of successful on-job performance.

The student will be expected to show understanding of the following in written examination or laboratory demonstration:

AC Models

- Coupling versus Bypass Capacitors
- AC/DC Analysis
- Small Signal Operation and AC Resistance Voltage Amplifiers
- Common Emitter Amplifiers and Voltage Gain Predicted Gain and Simplified Analysis
- Swamped and Cascaded Amplifiers Power Amplifiers
- AC Load Line and Signal Limits
- Class A Operation
- Power Rating, AC Saturation and Cutoff
- Thermal Resistance Emitter Followers
- Common Collector Amplifiers
- Maximum Output and Cascading
- Class B Operation
- Output Impedance and Voltage Regulation Communications Circuits
- Class C Operation
- Frequency Multipliers
- Harmonics
- Noise
- AM and FM circuits
- Frequency Effects
- Collector Bypass Circuits
- Miller's Theorem
- High Frequency Analysis
- Voltage Gain Outside the Midband
- Field Effect Transistors
- The Junction Field Effect Transistor (JFET)
- Transconductance Curves and JFET Approximations
- MOSFETs Data Sheets
- FET Circuits
- FET Curves and Transconductance
- JFET Amplifiers
- JFET Analog Switch
- MOSFETs
- JFET Applications

Course Learning Outcomes:

Learning Outcomes – Upon successful completion of this course, students will: Construct, analyze, test, and troubleshoot circuits containing various semiconductor devices. **Methods of Assessment:**

- Exams
- Homework
- Labs/Quizzes
- Reassessed in Capstone Experience: CETT 2349 Final Project course

Required text(s), optional text(s) and/or materials to be supplied by the student: An appropriate printed electronics text covering Solid State Devices. Example-Electronics Principles by Malvino.

Suggested Course Maximum:

30 lecture 20 laboratory

List any specific or physical requirements beyond a typical classroom required to teach the course.

Lecture facilities for 30 students. Laboratory facilities for 20 students must include 10 bench positions each with a digital meter, logic probe, 50 MHz oscilloscope and probes, breadboarding facility with power supply and signal generator, and a stock of basic circuit components.

Course Requirements/Grading System: Describe any course specific requirements such as research papers or reading assignments and the generalized grading format for the course.

Evaluation of Performance:

Course grades will be determined by the percentage of course objectives for which the student can demonstrate mastery and by attendance. Mastery of course objectives will be determined by written examinations, physical soldering exams, an attendance grade as described in the Departmental Policy handout, a daily work grade which will include graded homework, graded laboratory work, and a comprehensive final exam.

Approximate Grade Evaluation Summary: Major tests 60%
Attendance 10%
Lab reports, homework, and quizzes 15%
Final examination 15%

Grade Scale:

90 to 100:..... A
80 to 89:..... B
70 to 79:..... C
60 to 69:..... D
0 to 59: F



Curriculum Checklist:

- Administrative General Education Course** (from ACGM, but not in WCJC Core) – No additional documents needed.
- Administrative WCJC Core Course.** Attach the Core Curriculum Review Forms
 - Critical Thinking
 - Communication
 - Empirical & Quantitative Skills
 - Teamwork
 - Social Responsibility
 - Personal Responsibility
- WECM Course** -If needed, revise the Program SCANS Matrix and Competencies Checklist