Course Title - Solid State Circuits  
Course Prefix and Number - CETT 1341  
Department – Electronics Eng. Tech.  
Division - Technology and Business  
Course Type: (check one)  
☐ Academic General Education Course (from ACGM – but not in WCJC Core)  
☐ Academic WCJC Core Course  
☒ WECM course (This course is a Special Topics or Unique Needs Course: Y ☒ or N ☐)  

Semester Credit Hours #: Lecture hours#: Lab/Other Hours #: 3:3:1  
Equated Pay hours for course – 3.5  

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.

Prerequisites/Co Requisites - Credit for CETT 1429
I. Topical Outline – Each offering of this course must include the following topics (be sure to include information regarding lab, practicum, 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 perform the following tasks 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

II. Course Learning Outcomes

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<tr>
<th>Course Learning Outcome</th>
<th>Methods of Assessment</th>
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| Upon successful completion of this course, students will: | • Exams  
• Homework  
• Labs  
• Quizzes  
• Reassessed in Capstone Experience: CETT 2349 Final Project course |
| • Construct, analyze, test, and troubleshoot circuits containing various semiconductor devices, | |

III. Required Text(s), Optional Text(s) and/or Materials to be Supplied by Student.
An appropriate printed electronics text covering Solid State Devices. Example-Electronics Principles 7th by Malvino.

IV. Suggested Course Maximum – 30 lecture 15 laboratory

V. List any specific spatial or physical requirements beyond a typical classroom required to teach the course.
Lecture facilities for 30 students. Laboratory facilities for 18 students must include 9 bench positions each with a digital meter, logic probe, 20 MHz oscilloscope and probes, breadboarding facility with power supply and signal generator, and a stock of basic AC circuit components.
VI. 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 as stated in the Departmental Policy sheet provided to the student. Mastery of course objectives will be determined by written examinations, 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:

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Major tests</td>
<td>60%</td>
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<tr>
<td>Attendance</td>
<td>10%</td>
</tr>
<tr>
<td>Lab reports, homework, and quizzes</td>
<td>15%</td>
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<tr>
<td>Comprehensive Final examination</td>
<td>15%</td>
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</tbody>
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Grade Scale:
- 90 to 100: A
- 80 to 89: B
- 70 to 79: C
- 60 to 69: D
- 0 to 59: F

VII. Curriculum Checklist

☐ - Academic General Education Course (from ACGM – but not in WCJC Core)
   No additional documentation needed

☐ - Academic WCJC Core Course
   Attach the Core Curriculum Checklist, including the following:
   - Basic Intellectual Competencies
   - Perspectives
   - Exemplary Educational Objectives

☒ - WECM Courses
   If needed, revise the Program SCANS Matrix & Competencies Checklist.