**Course Title** - Linear Integrated Circuits  
**Course Prefix and Number** - CETT 1457  
**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  
- [X] WECM course (This course is a Special Topics or Unique Needs Course: **Y** or **N**)  

**Semester Credit Hours # : Lecture hours # : Lab/Other Hours #**  
4:3:3  

**Equate Pay hours for course – 4.5**  

**Course Catalog Description** - A study of the characteristics, operations, stabilization, testing, and feedback techniques of linear integrated circuits. Application in computation, measurements, instrumentation, and active filtering.

**Prerequisites/Co Requisites** - Credit for CETT 1405 and CETT 1429  

<table>
<thead>
<tr>
<th>List Lab/Other Hours</th>
<th>Lab Hours</th>
<th>Clinical Hours</th>
<th>Practicum Hours</th>
<th>Other (list)</th>
</tr>
</thead>
</table>

**Prepared by** David Kucera  
**Reviewed by Department Head** David Kucera  
**Accuracy verified by Division Chair** David Kucera  
**Approved by Dean or Vice President of Instruction** Leigh Ann Collins  

**Date** 05/15/15 05/20/15 05/20/15 12/3/15
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:

Frequency Effects
  Amplifier frequency response
  Decibel power gain
  Decibel voltage gain
  Bode plots
  Miller effect
  Bandwidth

Differential Amplifiers
  DC analysis
  AC analysis
  Input characteristics of an OP-Amp
  Common mode gain
  Bandwidth

Operational Amplifiers
  The 741
  Inverting
  Non-inverting
  Applications
  Linear ICs

Negative Feedback
  Types
  VCVS voltage gain
  ICVS amps
  VCIS amplifier
  Bandwidth

Linear Op-Amp Circuits
  Inverting
  Non-inverting
  Differential amplifiers
  Instrumentation amplifiers
  Summing amplifiers
Current boosters
Voltage controller sources
Automatic gain control

Active Filters
   Ideal response
   Passive filters
   First order stages
   Higher order filters
   Low pass
   High pass
   Band pass

Nonlinear circuits
   Comparators
   Integrators
   Waveform generators
   Differentiator

Oscillators
   Wein bridge
   Colpitts oscillator
   LC oscillators
   Crystal
   555 timer
   PLL

II. Course Learning Outcomes

<table>
<thead>
<tr>
<th>Course Learning Outcome</th>
<th>Methods of Assessment</th>
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<tbody>
<tr>
<td>Upon successful completion of this course, students will:</td>
<td></td>
</tr>
<tr>
<td>Construct and troubleshoot circuits containing linear integrated circuits</td>
<td>• Exams</td>
</tr>
<tr>
<td></td>
<td>• Homework</td>
</tr>
<tr>
<td></td>
<td>• Labs</td>
</tr>
<tr>
<td></td>
<td>• Quizzes</td>
</tr>
<tr>
<td></td>
<td>• Reassessed in Capstone Experience: CETT 2349 Final Project course</td>
</tr>
</tbody>
</table>

III. Required Text(s), Optional Text(s) and/or Materials to be Supplied by Student.
A printed text covering appropriate material such as Electronics Principles by Malvino and Bates.

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, bread boarding 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>
</tr>
<tr>
<td>Attendance</td>
<td>10%</td>
</tr>
<tr>
<td>Lab reports, homework, and quizzes.</td>
<td>15%</td>
</tr>
<tr>
<td>Comprehensive Final examination</td>
<td>15%</td>
</tr>
</tbody>
</table>

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.