



**Course Information**

<b>Course Title</b>	Linear Integrated Circuits
<b>Course Prefix, Num. and Title</b>	CETT 1457 Linear Integrated Circuits
<b>Division</b>	Technology and Business
<b>Department</b>	Electronics Engineering Technology
<b>Course Type</b>	WECM Course
<b>Course Catalog Description</b>	A study of the characteristics, operations, stabilization, testing, and feedback techniques of linear integrated circuits. Application in computation, measurements, instrumentation, and active filtering.
<b>Pre-Requisites</b>	Credit for CETT 1405 and CETT 1429
<b>Co-Requisites</b>	None

**Semester Credit Hours**

<b>Total Semester Credit Hours (SCH): Lecture Hours:</b>	4:3:3
<b>Lab/Other Hours</b>	
<b>Equated Pay Hours</b>	4.5
<b>Lab/Other Hours Breakdown: Lab Hours</b>	3
<b>Lab/Other Hours Breakdown: Clinical Hours</b>	0
<b>Lab/Other Hours Breakdown: Practicum Hours</b>	0
<b>Other Hours Breakdown</b>	0

**Approval Signatures**

<b>Title</b>	<b>Signature</b>	<b>Date</b>
<b>Prepared by:</b>		
<b>Department Head:</b>		
<b>Division Chair:</b>		
<b>Dean/VPI:</b>		
<b>Approved by CIR:</b>		

# 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 in the following 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
- Integrated Circuits

## 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 bridg
- Colpitts oscillator
- LC oscillators Crystal
- 555 timer
- PLL

### Course Learning Outcomes:

#### Learning Outcomes – Upon successful completion of this course, students will:

Construct and troubleshoot circuits containing linear integrated circuits

#### Methods of Assessment:

- Exams
- Homework
- Labs
- Quizzes
- Reassessed in capstone experience CETT 2349

### Required text(s), optional text(s) and/or materials to be supplied by the student:

A printed text covering appropriate material such as Electronics Principles by Malvino and Bates.

### Suggested Course Maximum:

20 lecture, 20 laboratory

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

Lecture facilities for 20 students. Laboratory facilities for 20 students must include 10 bench positions each with a digital meter, logic probe, 50 MHz oscilloscope and probes, bread boarding 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%

Version: 3/20/2019

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