



**Purpose:** It is the intention of this Administrative-Master Syllabus to provide a general description of the course, outline the required elements of the course and to lay the foundation for course assessment for the improvement of student learning, as specified by the faculty of Wharton County Junior College, regardless of who teaches the course, the timeframe by which it is instructed, or the instructional method by which the course is delivered. It is not intended to restrict the manner by which an individual faculty member teaches the course but to be an administrative tool to aid in the improvement of instruction.

**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
- 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**

**Equated 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.

List Lab/ Other Hours
Lab Hours 3
Clinical Hours
Practicum Hours
Other (list)

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

**Prepared by** David Kucera

**Date** 05/15/15

**Reviewed by Department Head** David Kucera

**Date** 05/20/15

**Accuracy verified by Division Chair** David Kucera

**Date** 05/20/15

**Approved by Dean or Vice President of Instruction** Leigh Ann Collins

**Date** 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
- 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 bridge  
 Colpitts oscillator  
 LC oscillators  
 Crystal  
 555 timer  
 PLL

**II. Course Learning Outcomes**

Course Learning Outcome	Methods of Assessment
<p><b>Upon successful completion of this course, students will:</b></p> <p>Construct and troubleshoot circuits containing linear integrated circuits</p>	<ul style="list-style-type: none"> <li>• Exams</li> <li>• Homework</li> <li>• Labs</li> <li>• Quizzes</li> <li>• Reassessed in Capstone Experience: CETT 2349 Final Project course</li> </ul>

**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:

Major tests .....	60%
Attendance.....	10%
Lab reports, homework, and quizzes. ....	15%
Comprehensive 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

**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.