Wharton County Junior College

Administrative - Master Syllabus
COVER SHEET

***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 - 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

List Lab/ Other Hours
Lab Hours 1
Clinical Hours
Practicum Hours
Other (list)

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

Prepared by David Kucera ***Date*** 06/20/12

Reviewed by department head David Kucera ***Date*** 06/20/12

Accuracy verified by Division Chair David Kucera ***Date*** 08/03/12

Approved by Dean of Vocational Instruction or Vice President of Instruction Lac ***Date*** 11-9-12

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

Course Learning Outcome	Method of Assessment
Analyze circuit operation with various semiconductor device applications; and measure, test, and troubleshoot circuits containing various semiconductor devices	Assessed in Capstone Experience: CETT 2370 Final Project course.

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:

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

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.