College of San Mateo
Course Outline

☐ New Course
☐ Update/No change
☒ Course Revision (Minor)
☐ Course Revision (Major)

Date: February 10, 2011

Department: ELEC **Number:** 112

Course Title: Advanced Electronics Applications **Units:** 3.0

Hours/Term: **Lecture:** 32 **Lab:** 48 **Homework:** 64 **By Arrangement:**

Length of Course

☒ Semester-long
☐ Short course (Number of weeks___)
☐ Open entry/Open exit

Grading

☒ Letter
☐ Credit/No Credit
☐ Grade Option (letter or Pass/No Pass)

Faculty Load Credit (To be completed by Division Office; show calculations.)**:**
32/16 + .7*48/16 = 2 + 2.1 = 4.1 FLC

1. **Prerequisite** (Attach Enrollment Limitation Validation Form.)

ELEC 111 or equivalent; ELEC 231; concurrent enrollment in or completion of ELEC232; completion of ENGL 828 or ESL 400 or equivalent OR appropriate skill level as indicated by the English or ESL placement test or other measures.

2. **Corequisite** (Attach Enrollment Limitation Validation Form.)

3. **Recommended Preparation** (Attach Enrollment Validation Form.)

None

4. **Catalog Description** (Include prerequisites/corequisites/recommended preparation.)

Minimum of thirty-two lecture hours and forty-eight lab hours per term. **Prerequisite:** ELEC 111 or equivalent; ELEC 231; concurrent enrollment in or completion of ELEC 232, completion of ENGL 828 or ESL 400 or equivalent OR appropriate skill level as indicated by the English or ESL placement test or other measures.
Continuation of ELEC 111. Introduction to more advanced electrical/electronics circuits. Includes AC circuit concepts, resonance and filter circuits, amplifiers and oscillators; examination of electric power and energy; exploration of relays and motors; further development in using electronic test equipment. Emphasizes laboratory experiments and techniques. A materials fee in the amount shown in the *Schedule of Classes* is payable upon registration (AA, CSU).

5. **Class Schedule Description** (Include prerequisites/corequisites/recommended preparation.)

Minimum of thirty-two lecture hours and forty-eight lab hours per term. Introduction to more advanced electrical/electronics circuits. Includes AC circuit concepts, resonance and filter circuits, amplifiers and oscillators; examination of electric power and energy; exploration of

relays and motors; further development in using electronic test equipment. Emphasizes laboratory experiments and techniques. **A materials fee of $__is payable upon registration**. **Prerequisite:** ELEC 111 or equivalent; ELEC 231; concurrent enrollment in or completion of ELEC 232, completion of ENGL 828 or ESL 400 or equivalent OR appropriate skill level as indicated by the English or ESL placement test or other measures. **Corequisite:** Concurrent enrollment in or completion of ELEC 232. (AA, CSU)

6. Student Learning Outcomes (Identify 1-6 expected learner outcomes using active verbs.)

Upon successful completion of the course, the student will be able to:

1. briefly define the following terms: electron theory; conductors and insulators; voltage, current, resistance, power; electrical energy consumption, kilowatt-hour meter; resistor color-code;
2. demonstrate competent use of a scientific calculator to determine the following: series and parallel circuit values; DC and AC voltages and currents; metric prefixes and conversion factors;
3. perform calculations involving Ohm's Law, Watt's Law and series/parallel/series-parallel circuits; Kirchhoff's Circuit Laws;
4. demonstrate proficient skill in the use of laboratory equipment: power supplies, analog and digital multimeters, function generators and oscilloscopes;
5. define and calculate the following AC values: AC power; peak-peak, peak, rms, effective, and average values; frequency, period, and wavelength;
6. define the following terms pertaining to electric power; power, energy and power transmission; residential wiring system; three-phase power;
7. define the following terms related to inductance and capacitance: inductive reactance (XL); capacitive reactance (Xc); RLC circuit; impedance (Z); resonance; timing, filtering, coupling and tuning;
8. explain the purpose and function of the following semiconductor devices: transistors; thyristors; integrated circuits;
9. demonstrate the use of semiconductor devices in the following circuits: amplifiers; oscillators; power control;
10. observe and interpret transistor characteristics in typical amplifier, oscillator, and power control circuits;
11. describe the operation of typical electromechanical devices and controllers: relays; motors; motor controllers; and processor-based controllers;
12. apply concepts learned to a working electronic system: AM/FM radio, amplifiers, oscillators, and power control (example: motor speed control)

7. Course Objectives (Identify specific teaching objectives detailing course content and activities. *For some courses, the course objectives will be the same as the student learning outcomes. If this is the case, please simply indicate this in this section).*

Same as above

8. Course Content (Brief but complete topical outline of the course that includes major subject areas [1-2 pages]. Should reflect all course objectives listed above. In addition, you may attach a sample course syllabus with a timeline.)

1. review the following terms: electron theory; conductors and insulators; voltage, current, resistance, power; electrical energy consumption, kilowatt-hour meter; resistor color-code; (objective 1)

2. review the use of a scientific calculator to determine the following: series and parallel circuit values; DC and AC voltages and currents; metric prefixes and conversion factors; (objectives 2, 3)
3. review calculations involving Ohm's Law, Watt's Law and series/parallel/ series-parallel circuits; Kirchhoff's Circuit Laws; (objectives 2, 3)
4. continue to develop skills in the use of laboratory equipment: power supplies, analog and digital multimeters, function generators and oscilloscopes; (objective 4)
5. review and calculate the following AC values: AC power; peak-peak, peak, rms, effective, and average values; frequency, period, and wavelength; (objective 5)
6. define the following terms pertaining to electric power; power, energy and power transmission; residential wiring system; three-phase power;
7. define the following terms related to inductance and capacitance: inductive reactance (XL); capacitive reactance (Xc); RLC circuit; impedance (Z); resonance; timing, filtering, coupling and tuning; (objective 7)
8. explain the purpose and function of the following semiconductor devices: transistors; thyristors; integrated circuits; (objective 8)
9. demonstrate the use of semiconductor devices in the following circuits: amplifiers; oscillators; power control; (objective 8, 9, 10)
10. observe and interpret transistor characteristics in typical amplifier, oscillator, and power control circuits; (objective 8, 9, 10)
11. describe the operation of typical electromechanical devices and controllers: relays; motors; motor controllers; and processor-based controllers;
12. apply concepts learned to a working electronic system: AM/FM radio, amplifiers, oscillators, and power control (objective 14)

9. Representative Instructional Methods (Describe instructor-initiated teaching strategies that will assist students in meeting course objectives. Include examples of out-of-class assignments, required reading and writing assignments, and methods for teaching critical thinking skills.)

a. Lectures
b. Handouts
c. Homework assignments from the textbook
d. Videos
e. Computer based training activities
f. Lab activities

10. Representative Methods of Evaluation (Describe measurement of student progress toward course objectives. Courses with required writing component and/or problem-solving emphasis must reflect critical thinking component. If skills class, then applied skills.)

a. Quizzes
b. Examinations
c. Homework assignments
d. CBT results
e. Lab activities

11. Representative Text Materials (With few exceptions, texts need to be current. Include publication dates.)

Petruzella. Essentials of Electronics. Second Edition. Copyright 2001.

CSM. ELEC 112 Advanced Electronics Applications: Laboratory Manual and Supplemental Handouts.

Prepared by: _____
(Signature)

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