



**Course Information**

<b>Course Title</b>	Research and Project Design
<b>Course Prefix, Num. and Title</b>	CETT 2349 Research and Project Design
<b>Division</b>	Technology and Business
<b>Department</b>	Electronics Engineering Technology
<b>Course Type</b>	WECM Course
<b>Course Catalog Description</b>	Principles of electrical/electronic design encompassing schematics, wiring diagrams, materials lists, operating characteristics, completion schedules, and cost estimates. The student will be required to plan and develop a project consisting of research, design, layout, construction and operation of an electrical-mechanical project. A formal written report and a demonstration and presentation of process and results are required. This course is intended to provide a Capstone experience for graduating Electronics Engineering Technology students.
<b>Pre-Requisites</b>	Electronics Engineering Technology major expecting completion of all Electronics courses in the current semester
<b>Co-Requisites</b>	None

**Semester Credit Hours**

<b>Total Semester Credit Hours (SCH): Lecture Hours:</b>	3:2:2
<b>Lab/Other Hours</b>	
<b>Equated Pay Hours</b>	3
<b>Lab/Other Hours Breakdown: Lab Hours</b>	2
<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 perform the following tasks in written examination or laboratory demonstration:

- Week 1 : Introductions and Project consideration
- Week 2 : Begin project design
- Week 3 : Complete design with all documentation and schedules. Week 4 : Preliminary design..
- Week 5 : Obtain parts/assemble on breadboard. Week 6 : Obtain parts/assemble prototype
- Week 7 : Prototype testing
- Week 8 : Design refinement
- Week 9-13: Build hardware and test assembly
- Week 14-15: Final functionality tests and documentation collection
- Week 16 : Project and all documentation Due.

### Course Learning Outcomes:

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

- Build a project using the principles of the electrical/electronic design process
- Write an operations procedure of an electrical/electronic project
- Demonstrate the operation or function of an electrical/electronic project
- Use Critical thinking
- Apply verbal and written communication
- Work as a team
- Apply project management skills
- Show responsibility and ethical work habits
- Apply technical knowledge and skills

#### Methods of Assessment:

All outcomes are assessed by a standardized departmental rubric

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

Departmental handouts, Internet, library, and data book references

### 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, a comprehensive stock of electronic components, soldering irons, cutting, and drilling equipment.

**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%

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