University of Hawaii Maui College
ETRO 296 - Special Projects in ECET

1. **Course Alpha. Please click on the ? to the right for help.**

   ETRO

2. **Course Number. Please click on the ? to the right for help.**

   296

3. **Course Title/Catalog Title. Please click on the ? to the right for help.**

   Special Projects in ECET

4. **Number of Credits. Please click on the ? to the right for help.**

   3

5. **Contact Hours/Type. Please click on the ? to the right for help.**

   - Hour lecture/lab (4)

6. **Course Description. Please click on the ? to the right for help.**

   Develops special topics in electronic and digital computer technology. Creates, designs, and builds an electronics and computer engineering technology capstone student project. Investigates required schematics, components, and devices for the project. Includes programming, testing, troubleshooting, and characterization. Demonstrates, explains, and presents project goals, milestones, and results.

7. **Pre-Requisites. Please click on the ? to the right for help.**

   ETRO 140 and ETRO 201 and MATH 119 or 135 (or higher), all with grade C or better; or consent.

8. **Co-requisites.**

   None.

9. **Recommended Preparation.**

   None.

10. **Is this a cross-listed course? Please click on the ? to the right for help.**

    NO

11. **Reason for Proposal. Why is this course being proposed or modified? This question requires specific information as part of the explanation. Please click on the ? to the right for help.**

    The math pre-requisite has changed: MATH 119 replaces MATH 107 to better prepare ECET students for math in the BAS ENGT degree program.

12. **Effective Semester and Year. For new or modified courses, the effective year is one year from the semester proposed. For example, if proposed in Spring 2012, the effective semester is Spring 2013. Please click on the ? to the right for help.**

    Fall 2015

13. **Grading Method. What grading methods may be used for this course? Please click on the ? to the right for help.**

    - Standard (Letter,Cr/NCr,Audit) (0)

14. **Is this course repeatable for credit? How often can this course be counted toward a degree or certificate? Please click on the ? to the right for help.**

    NO

15. **Course Student Learning Outcomes (SLOs). DO NOT ENTER TEXT IN THE TEXT BOX BELOW. Click on the yellow button "COURSE LEARNING OUTCOMES" and enter in that screen. Please click on the ? to the right for help.**

Course SLO/Competency	Describe research tools used	Identify sources of designs, devices, circuits, and parts needed in a project	Describe the purpose of Data Books and other references	Design, build, test or service and program a project	Describe the purpose engineering notebook and engineering reports	Prepare a written report for your project and present it to the class	Research a current topic in technology and present a technical update to the class	Understand the importance of providing good customer service
Analyze special topics in technology that are of current interest.			☑	☑		☑		
Analyze and test electronic and computer building block circuits including devices, subsystems and systems to create a useful product or service.	☑	☑		☑				
Research and develop a project and present a final report and completed project by a given date.	☑		☑		☑	☑	☑	☑
Use test equipment to troubleshoot circuits.	☑			☑				

Course SLO/PSLO	Analyze, design, and implement electro-optic systems, control systems, instrumentation systems, communication systems, computer systems, or power systems;	Apply project management techniques to electrical/electronic(s) and computer systems	Demonstrate critical engineering technology skills and experiences such as: making existing technology operate, creating/selecting new technology, troubleshooting, calibrating, characterizing, and optimizing;	Demonstrate engineer's way of thinking, analyzing technology as systems;	Demonstrate engineer professional skills such as communication and managing projects;	Demonstrate proficiency in the general education college core requirements: creativity, critical thinking, oral and written communication, information retrieval, quantitative reasoning;	Demonstrate a respect for diversity and a knowledge of contemporary professional, societal and global issues;	Commit to quality, timeliness, and continuous improvement.	Utilize appropriate mathematics at the level of algebra and trigonometry to solve technical problems;
Analyze special topics in technology that are of current interest.	☑		☑						☑
Analyze and test electronic and computer building block circuits including devices, subsystems and systems to create a useful product or service.		☑		☑					
Research and develop a project and present a final report and completed project by a given date.		☑		☑	☑	☑	☑	☑	☑
Use test equipment to troubleshoot circuits.			☑						

16. Course Competencies. DO NOT ENTER TEXT IN THE TEXT BOX BELOW. Click on the yellow button "COURSE COMPETENCIES/ISSUES/SKILLS" and enter text in that screen. Course competencies are smaller, simpler tasks that connect to and facilitate the SLOs.

Competency
Describe research tools used
Identify sources of designs, devices, circuits, and parts needed in a project

Describe the purpose of Data Books and other references
Design, build, test or service and program a project
Describe the purpose engineering notebook and engineering reports
Prepare a written report for your project and present it to the class
Research a current topic in technology and present a technical update to the class
Understand the importance of providing good customer service

17. Recommended Course Content and Timeline. The course content facilitates the course competencies. Course content may be organized by weeks, units, topics or the like.

Content
1 week Introduction to digital electronics and digital hardware design
1-2 weeks Project topics review; research resources and methods
1-2 weeks Submit project outline, approval by instructor. Current topics and technical publications
1-2 weeks Current topics and project design. Students present topics and project design
1-3 weeks Students present topics and project construction
1-2 weeks High technology on Maui and Hawaii. Educational and technology
1-2 weeks Project testing and troubleshooting
1-2 weeks Project reports presented and testing
1-2 weeks Project reports presented and projects must be finished

18. Program Learning Outcomes. DO NOT ENTER TEXT IN THE TEXT BOX BELOW. Click on the yellow button "PLOs" and enter text in that screen. Program Student Learning Outcomes (PLOs) supported by this course. If you are not a "program" use the Liberal Arts PLOs, view them by clicking on ? icon to the right.

Program SLO
Analyze, design, and implement electro-optic systems, control systems, instrumentation systems, communication systems, computer systems, or power systems;
Apply project management techniques to electrical/electronic(s) and computer systems
Demonstrate critical engineering technology skills and experiences such as: making existing technology operate, creating/selecting new technology, troubleshooting, calibrating, characterizing, and optimizing;
Demonstrate engineer's way of thinking, analyzing technology as systems;
Demonstrate engineer professional skills such as communication and managing projects;
Demonstrate proficiency in the general education college core requirements: creativity, critical thinking, oral and written communication, information retrieval, quantitative reasoning;
Demonstrate a respect for diversity and a knowledge of contemporary professional, societal and global issues;
Commit to quality, timeliness, and continuous improvement.
Utilize appropriate mathematics at the level of algebra and trigonometry to solve technical problems;

19. College-wide Academic Student Learning Outcomes (CASLOs). FIRST, fill out the CASLO grid located in the UHMC tab above. Click on the HELP icon for tips on determining support for the CASLOs and indicate your choices below by clicking on the box in front of each supported CASLO. NOTE: Our campus does not use the Preparatory Level, Level 1 and Level 2 designations in the chart below.

☑	**Creativity** - Able to express originality through a variety of forms. ☑ Preparatory Level
☑	**Critical Thinking** - Apply critical thinking skills to effectively address the challenges and solve problems. ☑ Preparatory Level
☑	**Information Retrieval and Technology** - Access, evaluate, and utilize information effectively, ethically, and responsibly. ☑ Preparatory Level
☑	**Oral Communication** - Practice ethical and responsible oral communications appropriately to a variety of audiences and purposes.

	☑ Preparatory Level
☑	**Quantitative Reasoning** - Synthesize and articulate information using appropriate mathematical methods to solve problems of quantative reasoning accurately and appropriately. ☑ Preparatory Level
☑	**Written Communication** - Write effectively to convey ideas that meet the needs of specific audiences and purposes. ☑ Preparatory Level

GenED SLO
Creativity - Able to express originality through a variety of forms.
Critical Thinking - Apply critical thinking skills to effectively address the challenges and solve problems.
Information Retrieval and Technology - Access, evaluate, and utilize information effectively, ethically, and responsibly.
Oral Communication - Practice ethical and responsible oral communications appropriately to a variety of audiences and purposes.
Quantitative Reasoning - Synthesize and articulate information using appropriate mathematical methods to solve problems of quantative reasoning accurately and appropriately.
Written Communication - Write effectively to convey ideas that meet the needs of specific audiences and purposes.

20. Linking. CLICK ON CHAIN LINK ICON IN UPPER RIGHT HAND CORNER TO BEGIN LINKING. Please click on the ? to the right for help.

21. Method(s) of delivery appropriate for this course. Please click on the ? to the right for help.

- Classroom/Lab (0)
- Other, explain (0)

On the project site.

22. Text and Materials, Reference Materials, and Auxiliary Materials. Please click on the ? to the right for help.

Materials: none

Others: Engineering notebook

Parts and devices as needed for project

23. Maximum enrollment. Please click on the ? to the right for help.

24

24. Particular room type requirement. Is this course restricted to particular room type? Please click on the ? to the right for help.

YES

This course needs a lab that has all the equipment required to carry out the experiments for the project (like KAA 217).

25. Special scheduling considerations. Are there special scheduling considerations for this course? Please click on the ? to the right for help.

YES

This course must fit the ECET AS degree course scheduling.

26. Are special or additional resources needed for this course? Please click on the ? to the right for help.

Electronics equipment: power supplies, function generators, oscilloscopes. Ohmmeters, ammeters, voltmeters. Solder stations and breadboards. Electronic components. C omputers.

Software packages: Multisim, Microsoft Project.

Parts and devices as needed for the project.

27. Does this course require special fees to be paid for by students? Please click on the ? to the right for help.

NO

28. Does this course change the number of required credit hours in a degree or certificate? Please click on the ? to the right for help.

No.

29. Course designation(s) for the Liberal Arts A.A. degree and/or for the college's other associate degrees. Please click on the ? to the right for help.

Degree	Program	Category
Associate in Arts:	Liberal Arts	LE - Elective LE - Elective
AS:	ECET - All	PR - Program Requirement
AAS:		
BAS:		
Developmental/ Remedial:		

30. Course designation(s) for other colleges in the UH system.

This course transfers as an elective.

31. Indicate the year and page # of UHMC catalog referred to. For new or modified courses, please indicate the catalog pages that need to be modified and provide a sheet outlining those changes.

Referred catalog and modifications: pages 45 and 113 in UHMC's 2014-2015 general catalog.

32. College-wide Academic Student Learner Outcomes (CASLOs). Please click on the HELP icon for more information.

Standard 1 - Written Communication **Write effectively to convey ideas that meet the needs of specific audiences and purposes.**		
Outcome 1.1 - Use writing to discover and articulate ideas.		1
Outcome 1.2 - Identify and analyze the audience and purpose for any intended communication.		1
Outcome 1.3 - Choose language, style, and organization appropriate to particular purposes and audiences.		2
Outcome 1.4 - Gather information and document sources appropriately.		3
Outcome 1.5 - Express a main idea as a thesis, hypothesis, or other appropriate statement.		3
Outcome 1.6 - Develop a main idea clearly and concisely with appropriate content.		3
Outcome 1.7 - Demonstrate a mastery of the conventions of writing, including grammar, spelling, and mechanics.		1
Outcome 1.8 - Demonstrate proficiency in revision and editing.		1
Outcome 1.9 - Develop a personal voice in written communication.		1
Standard 2 - Quantitative Reasoning **Synthesize and articulate information using appropriate mathematical methods to solve problems of quantative reasoning accurately and appropriately.**		
Outcome 2.1 - Apply numeric, graphic, and symbolic skills and other forms of quantitative reasoning accurately and appropriately.		3
Outcome 2.2 - Demonstrate mastery of mathematical concepts, skills, and applications, using technology when appropriate.		3
Outcome 2.3 - Communicate clearly and concisely the methods and results of quantitative problem solving.		3
Outcome 2.4 - Formulate and test hypotheses using numerical experimentation.		3
Outcome 2.5 - Define quantitative issues and problems, gather relevant information, analyze that information, and present		3

results.		
Outcome 2.6 - Assess the validity of statistical conclusions.		2
Standard 3 - Information Retrieval and Technology. Access, evaluate, and utilize information effectively, ethically, and responsibly.		
Outcome 3.1 - Use print and electronic information technology ethically and responsibly.		2
Outcome 3.2 - Demonstrate knowledge of basic vocabulary, concepts, and operations of information retrieval and technology.		2
Outcome 3.3 - Recognize, identify, and define an information need.		2
Outcome 3.4 - Access and retrieve information through print and electronic media, evaluating the accuracy and authenticity of that information.		2
Outcome 3.5 - Create, manage, organize, and communicate information through electronic media.		2
Outcome 3.6 - Recognize changing technologies and make informed choices about their appropriateness and use.		2
Standard 4 - Oral Communication Practice ethical and responsible oral communications appropriately to a variety of audiences and purposes.		
Outcome 4.1 - Identify and analyze the audience and purpose of any intended communication.		1
Outcome 4.2 - Gather, evaluate, select, and organize information for the communication.		2
Outcome 4.3 - Use language, techniques, and strategies appropriate to the audience and occasion.		2
Outcome 4.4 - Speak clearly and confidently, using the voice, volume, tone, and articulation appropriate to the audience and occasion.		1
Outcome 4.5 - Summarize, analyze, and evaluate oral communications and ask coherent questions as needed.		2
Outcome 4.6 - Use competent oral expression to initiate and sustain discussions.		2
Standard 5 - Critical Thinking Apply critical thinking skills to effectively address the challenges and solve problems.		
Outcome 5.1 - Identify and state problems, issues, arguments, and questions contained in a body of information.		3
Outcome 5.2 - Identify and analyze assumptions and underlying points of view relating to an issue or problem.		3
Outcome 5.3 - Formulate research questions that require descriptive and explanatory analyses.		2
Outcome 5.4 - Recognize and understand multiple modes of inquiry, including investigative methods based on observation and analysis.		2
Outcome 5.5 - Evaluate a problem, distinguishing between relevant and irrelevant facts, opinions, assumptions, issues, values, and biases through the use of appropriate evidence.		3
Outcome 5.6 - Apply problem-solving techniques and skills, including the rules of logic and logical sequence.		3
Outcome 5.7 - Synthesize information from various sources, drawing appropriate conclusions.		2
Outcome 5.8 - Communicate clearly and concisely the methods and results of logical reasoning.		2
Outcome 5.9 - Reflect upon and evaluate their thought processes, value system, and world views in comparison to those of others.		2
Standard 6 - Creativity Able to express originality through a variety of forms.		
Outcome 6.1: Generate responses to problems and challenges through intuition and non-linear thinking.		2
Outcome 6.2: Explore diverse approaches to solving a problem or addressing a challenge.		2
Outcome 6.3: Sustain engagement in activities without a preconceived purpose.		2
Outcome 6.4: Apply creative principles to discover and express new ideas.		2
Outcome 6.5: Demonstrate the ability to trust and follow one's instincts in the absence of external direction		2
Outcome 6.6: Build upon or adapt the ideas of others to create novel expressions or new solutions.		2