

ECE 5465 (Proposed): Advanced Microcomputers

Course Description

An investigation of current microcomputer structures with emphasis on hardware implementation of I/O, direct memory access, interrupts, memory, and microprogramming.

Prior Course Number: ECE 765

Transcript Abbreviation: Adv Microcomp

Grading Plan: Letter Grade

Course Deliveries: Classroom

Course Levels: Undergrad, Graduate

Student Ranks: Junior, Senior, Masters, Doctoral

Course Offerings: Spring

Flex Scheduled Course: Never

Course Frequency: Every Year

Course Length: 14 Week

Credits: 3.0

Repeatable: No

Time Distribution: 3.0 hr Lec

Expected out-of-class hours per week: 6.0

Graded Component: Lecture

Credit by Examination: No

Admission Condition: No

Off Campus: Never

Campus Locations: Columbus

Prerequisites and Co-requisites: Prereq: 5362, or 662 and 694A, or Grad standing in Engineering.

Exclusions: Not open to students with credit for 765.

Cross-Listings:

Course Rationale: Existing course.

The course is required for this unit's degrees, majors, and/or minors: No

The course is a GEC: No

The course is an elective (for this or other units) or is a service course for other units: Yes

Subject/CIP Code: 14.0902

Subsidy Level: Doctoral Course

Programs

Abbreviation	Description
CpE	Computer Engineering
EE	Electrical Engineering

Course Goals

Learn the architecture of an advanced microprocessor and microcontroller
Learn to evaluate and use peripheral support devices such a memory, parallel ports, serial ports, real time clocks
Learn how to design large-scale embedded microprocessor and microcontroller based systems
Learn how to develop advanced software to control real-time embedded systems including interrupts and exception handling

Course Topics

Topic	Lec	Rec	Lab	Cli	IS	Sem	FE	Wor
Architecture, programmer's model, and application of a 16/32 bit microprocessor.	8.0							
Assembly language programming.	4.0							
Interrupt and exception handling	5.0							
I/O support devices and interfacing	7.0							
Memory types and applications: static, dynamic, DMA	3.0							
Introduction to a modern microcontroller(s)	8.0							
Design examples	6.0							

Representative Assignments

Homework problems corresponding to lecture material. Interface designs, interface program assembler code, and code segments.
Interfacing project using modern simulation tools.

Grades

Aspect	Percent
Midterm Exam(s)	25%
Homework/Projects	20%
Microcomputer Architecture Paper	10%
Quizzes	15%
Final Exam	30%

Representative Textbooks and Other Course Materials

Title	Author
<i>(recommended) Microcomputer Systems Design: 68000 Hardware, Software</i>	Alan Clements

ABET-EAC Criterion 3 Outcomes

Course Contribution		College Outcome
***	a	An ability to apply knowledge of mathematics, science, and engineering.
*	b	An ability to design and conduct experiments, as well as to analyze and interpret data.
***	c	An ability to design a system, component, or process to meet desired needs.
	d	An ability to function on multi-disciplinary teams.
***	e	An ability to identify, formulate, and solve engineering problems.
	f	An understanding of professional and ethical responsibility.
*	g	An ability to communicate effectively.
	h	The broad education necessary to understand the impact of engineering solutions in a global and societal context.
*	i	A recognition of the need for, and an ability to engage in life-long learning.
	j	A knowledge of contemporary issues.

Course Contribution		College Outcome
***	k	An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

Additional Notes or Comments

update rereqs, exclusion, goals and topics to match university format.
updated text info, 5/10/17, CED

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