

CALIFORNIA STATE UNIVERSITY CHANNEL ISLANDS

COURSE MODIFICATION PROPOSAL

Courses must be submitted by October 15, 2010, and finalized by the end of the fall semester to make the next catalog (2011-12) production

DATE (CHANGE DATE EACH TIME REVISED): 7/5/11

PROGRAM AREA(S): COMPUTER SCIENCE

Directions: All of sections of this form must be completed for course modifications. Use **YELLOWED** areas to enter data. All documents are stand alone sources of course information.

1. Course Information.

[Follow accepted catalog format.] (Add additional prefixes if cross-listed)

OLD

Prefix COMP Course# 462 Title Embedded Systems Units (3)
3 hours lecture per week
[] hours blank per week

X Prerequisites: Comp 350 and Comp 362

[] Consent of Instructor Required for Enrollment

Corequisites: []

Catalog Description (Do not use any symbols): Covers the design of embedded systems. This includes the analysis of small computer systems designed for robotic mechanisms and common appliances such as cell phones and other hand held devices. Topics include the design, implementation and testing of software used in such systems with special attention paid to maximizing the use of limited computational resources and the need for event-driven real time system responses.

General Education Categories []
[] Lab Fee Requested

Graded
[] CR/NC

X A - F

[] Repeatable for up to [] units
Total Completions []

Course Level:
X Undergraduate
[] Post-bac/Credential
[] Graduate

[] Optional (Student's choice)

[] Multiple Enrollment in same semester

NEW

Prefix COMP Course# 462 Title Embedded Systems Units (3)
2 hours lecture per week
1 hour laboratory per week

X Prerequisites: Comp 350 and Comp 362 or consent of the instructor.

[] Consent of Instructor Required for Enrollment

Corequisites: []

Catalog Description (Do not use any symbols): Covers the design of embedded systems. This includes the analysis of small computer systems designed for robotic mechanisms and common appliances such as cell phones and other hand held devices. Topics include the design, implementation and testing of software used in such systems with special attention paid to maximizing the use of limited computational resources and the need for event-driven real time system responses.

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Graded
[] CR/NC

X A - F

[] Repeatable for up to [] units
Total Completions []

Course Level:
X Undergraduate
[] Post-bac/Credential
[] Graduate

[] Optional (Student's choice)

[] Multiple Enrollment in same semester

2. Mode of Instruction (Hours per Unit are defaulted)

Hegis Code(s) _____
(Provided by the Dean)

Existing

Proposed

	Units	Hours Per Unit	Benchmark Enrollment	Graded		Units	Hours Per Unit	Benchmark Enrollment	Graded	CS No. (filled out by Dean)
Lecture	<u>3</u>	<u>1</u>	<u>24</u>	y	Lecture	<u>2</u>	<u>1</u>	<u>24</u>	y	[]
Seminar	[]	<u>1</u>	[]	[]	Seminar	[]	<u>1</u>	[]	[]	[]
Lab	[]	<u>3</u>	[]	[]	Lab	<u>1</u>	<u>3</u>	<u>24</u>	y	[]
Activity	[]	<u>2</u>	[]	[]	Activity	[]	<u>2</u>	[]	[]	[]
Field Studies	[]	[]	[]	[]	Field Studies	[]	[]	[]	[]	[]
Indep Study	[]	[]	[]	[]	Indep Study	[]	[]	[]	[]	[]
Other blank	[]	[]	[]	[]	Other blank	[]	[]	[]	[]	[]

3. Course Attributes:

General Education Categories: All courses with GE category notations (including deletions) must be submitted to the GE website: <http://summit.csuci.edu/geapproval>. Upon completion, the GE Committee will forward your documents to the Curriculum Committee for further processing.

A (English Language, Communication, Critical Thinking)

- A-1 Oral Communication
- A-2 English Writing
- A-3 Critical Thinking

B (Mathematics, Sciences & Technology)

- B-1 Physical Sciences
- B-2 Life Sciences – Biology
- B-3 Mathematics – Mathematics and Applications
- B-4 Computers and Information Technology

C (Fine Arts, Literature, Languages & Cultures)

- C-1 Art
- C-2 Literature Courses
- C-3a Language
- C-3b Multicultural

D (Social Perspectives)

E (Human Psychological and Physiological Perspectives)

UDIGE/INTD Interdisciplinary

Meets University Writing Requirement

Meets University Language Requirement

American Institutions, Title V Section 40404: Government US Constitution US History
Refer to website, Exec Order 405, for more information: <http://senate.csuci.edu/comm/curriculum/resources.htm>

Service Learning Course (Approval from the Center for Community Engagement must be received before you can request this course attribute).

4. Justification and Requirements for the Course. *[Make a brief statement to justify the need for the course]*

OLD

Embedded systems encompass software that resides on small computers that control appliances, cars, telephones as well as robots. Very often, the software has to respond to events that occur in real-time, so it introduces hard deadlines on the timing of responses so the system has to be written in a way that allows fulfilling such time-critical applications. The controllers constitute very specific programming environments that include gateways to control manipulators and sensors. This course will teach the students how to write effective programs in such environments, how to debug and deploy them and how to manage their lifecycles

- Requirement for the Major/Minor
- X Elective for the Major/Minor
- Free Elective

NEW

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- Free Elective

Submit Program Modification if this course changes your program.

5. Student Learning Outcomes. (List in numerical order. You may wish to visit resource information at the following website: <http://senate.csuci.edu/comm/curriculum/resources.htm>)

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

OLD

Sketch the key components of embedded system software
Identify, reference and analyze embedded systems industry standards

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Sketch the key components of embedded systems hardware
 Select the appropriate software architecture for an embedded system design
 Produce software designs that use computer ports effectively
 Produce working software used as "drivers" for embedded systems
 Identify and sketch the key components of a real time embedded system
 Identify and sketch the key components of a robotic controller
 Produce working software that adds some elements of intelligence to a robot.

Sketch the key components of embedded systems hardware
 Select the appropriate software architecture for an embedded system design
 Produce software designs that use computer ports effectively
 Produce working software used as "drivers" for embedded systems
 Identify and sketch the key components of a real time embedded system
 Identify and sketch the key components of a robotic controller
 Produce working software that adds some elements of intelligence to a robot.

6. Course Content in Outline Form. (Be as brief as possible, but use as much space as necessary)

OLD

- * Principles of real-time systems
- * Fundamental hardware concepts
- * Microprocessors
- * Device drivers
- * Embedded operating systems
- * Fundamentals of robotics
- * Handling touch sensors
- * Handling vision
- * Controlling manipulators
- * Math for robots
- * Self-orientation
- * Multi-robot environment

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Does this course content overlap with a course offered in your academic program? Yes ☐ No ☒ X
 If YES, what course(s) and provide a justification of the overlap.

Does this course content overlap a course offered in another academic area? Yes ☐ No ☒ X
 If YES, what course(s) and provide a justification of the overlap.

Overlapping courses require Chairs' signatures.

7. Cross-listed Courses (Please note each prefix in item No. 1)

- A. List cross-listed courses (Signature of Academic Chair(s) of the other academic area(s) is required).
- B. List each cross-listed prefix for the course:
- C. Program responsible for staffing:

8. References. [Provide 3-5 references]

OLD Embedded Systems Architecture: A Comprehensive Guide for Engineers and Programmers, Tammy Noergaard, Spring 2001

An Embedded Software Primer, David E. Sloan, Addison-Wesley Professional 1999

Buiding Robots with Lego Mindstorms: The Ultimate Tool for Mindstorms Maniacs, Mario Ferrari, Giulio Ferrari, Ralph Hempel, Syngress, 2001

Creative Projects with Lego Mindstorms, Benjamin Erwin, Addison-Wesley Professional, 2001

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9. Tenure Track Faculty qualified to teach this course.

All Computer Science Faculty

10. Requested Effective Date or First Semester offered: Fall 2012

11. New Resource Requested: Yes ☐ No ☒

If YES, list the resources needed.

A. Computer Needs (data processing, audio visual, broadcasting, other equipment, etc.)

☐

B. Library Needs (streaming media, video hosting, databases, exhibit space, etc.)

☐

C. Facility/Space/Transportation Needs:

☐

D. Lab Fee Requested: Yes ☐ No ☐ (Refer to the Dean's Office for additional processing)

E. Other. ☐

12. Indicate Changes and Justification for Each. [Check all that apply and follow with justification. Be as brief as possible but, use as much space as necessary.]

☐ Course title

☐ Prefix/suffix

☐ Course number

☐ Units

☐ Staffing formula and enrollment limits

☒ Prerequisites/Corequisites

☐ Catalog description

☒ Mode of Instruction

☐ Course Content

☐ Course Learning Outcomes

☐ References

☐ GE

☐ Other ☐

☐ Reactivate Course

Justification: 1. Formalizes the ability of the instructor to waive pre-requisites. Students in the Minor in Robotics Engineering, for which this is a required course, may have equivalent industry experience.

2. Significant projects are an important focus of the course. In order for students to succeed in the course there needs to be significant instructor assistance in a hands-on manner. A scheduled laboratory provides the time for this.

13. Will this course modification alter any degree, credential, certificate, or minor in your program? Yes ☐ No ☒

If, YES attach a program update or program modification form for all programs affected.

Priority deadline for New Minors and Programs: **October 4, 2010** of preceding year.

Priority deadline for Course Proposals and Modifications: **October 15, 2010.**

Last day to submit forms to be considered during the current academic year: **April 15th.**

Peter Smith

6/21/11

Proposer(s) of Course Modification

Date

Type in name. Signatures will be collected after Curriculum approval.

Approval Sheet

Course: COMP 462

If your course has a General Education Component or involves Center affiliation, the Center will also sign off during the approval process.

Multiple Chair fields are available for cross-listed courses.

Program Chair		
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Signature

Date

Program Chair		
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Signature

Date

Program Chair		
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Signature

Date

General Education Chair		
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Signature

Date

Center for Intl Affairs Director		
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Signature

Date

Center for Integrative Studies Director		
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Signature

Date

Center for Multicultural Engagement Director		
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Signature

Date

Center for Civic Engagement and Service Learning Director		
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Signature

Date

Curriculum Chair		
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Signature

Date

Dean of Faculty		
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Signature

Date