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Curriculum Proposal

Please type or select the requested information. Print completed forms, add appropriate paper attachments, and route through MSU's curricular process for recommendations and decisions.

College: Science, Engineering and Technology
Department: Computer Science
Program: Computer Science
Type of Change Proposed: COURSE PROPOSALS / New Course
Title Current:
Title Proposed: Machine Structures and Programming Lab
24-Char. Abbrev: Machine Struct/Prog Lab

(Check all that apply):
☒ Undergraduate
☐ Graduate
CIP # 11.010104

Proposal # 383
Effective Date of Change:
Academic Year 06-07
(For Office Use Only)

Course Designator and Number	Number of Credits
CS 221	1

(if applicable)

Include a course or program description for the Bulletin (30-40 words maximum for courses, 100 for programs):

This laboratory course complements CS 220, offering students hands-on programming experience to reinforce assembly language programming concepts. Topics include number systems; instruction formats, addressing modes and their use; and parameter passing techniques including the use of a stack frame.
Coreq: CS 220 F, S

Rationale or Justification for change:

CS 220 is to be divided into a 3-credit lecture and a 1-credit lab. This new course is the 1-credit lab, intended for Computer Science students to take concurrently with CS 220. EE/CE students will take an appropriate laboratory course from the EE/CE curriculum.

For General Education or Cultural Diversity Courses Only

General Education Course:

GE Category #	GE Category Name (Maximum of 3 Categories)
	N/A
	N/A
	N/A

? For Writing Intensive Courses, attach a description of the kind and quantity of writing.
? For Upper Division Courses, include a description of the respects in which it is broad and general rather than narrow and specific, and so suitable as GE.

Cultural Diversity Course:

(Please check one.)

☐ **Core** (At least 75% devoted to topics of race, gender, sexual orientation, age, class, and disabilities as they occur in United States Society.)

☐ **Related** (At least 25% devoted to the above topics or to a global perspective on topics related to African American, Asian, Hispanic, and Native American inhabitants of the United States.)

Attach paper copies of the following:
a. Syllabus or course outline.
b. Course's student learning outcomes associated with each GE competency or CD designation.
c. List of strategies to be used to assess students' achievement of each GE competency or CD designation.

For New Courses

(Check all that apply:)
☐ Course is an elective.
☒ Course is required for program
☒ Pre- or Co-requisites: Coreq: CS 220
☒ Other courses are being changed or eliminated. (Explain.) This is the lab component of CS 220. The lab is being separated o so that EE/CE majors can continue to take CS 220, but take a more hardware-specific lab appropriate for their major.
☐ Course content or title is similar to courses in other departments. (Attach copy of letter of agreement with other program(s) contacted. Indicate the nature of the discussions and/or resolution of differences or potential conflicts.)

Instructional Type: Lab
Grading Format: ☒ Grade ☐ P/N

Course will be offered:
☒ Fall Semester
☒ Spring Semester
☐ Summer Session

Attach paper copies of the following:
a. Syllabus or course outline.
b. Course's student learning outcomes.
c. A list of resources required to offer and support this course.
d. A description of how teaching this course will affect department staffing.
e. If 400/500 level course, an explanation of added expectations of graduate students.

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Curriculum Proposal

*****Signature Page*****

Department

✓ Recommended (Category/ies_____)

__ Not Recommended (Category/ies_____)

Department Chair — Date: 2/28/07

Comments:

College Curriculum Committee

X Recommended (Category/ies_____)

__ Not Recommended (Category/ies_____)

Committee Chair — Date: 3/29/07

Comments:

College Dean

✓ Recommended (Category/ies_____)

__ Not Recommended (Category/ies_____)

Dean — Date: 3/30/07

Comments:

General Education Subcommittee

__ Recommended (Category/ies_____)

__ Not Recommended (Category/ies_____)

General Education Subcommittee Chair — Date

Comments:

Undergraduate Curriculum and Academic Policy Committee

__ Recommended (Category/ies_____)

__ Not Recommended (Category/ies_____)

UCAP Faculty Chair — Date

Comments:

Faculty Association Graduate Committee

__ Recommended

__ Not Recommended

Faculty Association Graduate Chair — Date

Comments:

Graduate Dean

__ Recommended

__ Not Recommended

Graduate Dean — Date

Comments:

Academic Affairs Council

__ Recommended (Category/ies_____)

__ Not Recommended (Category/ies_____)

Assistant Vice President — Date

Comments:

Senior Vice President and Vice President for Academic Affairs

__ Approved (Category/ies_____)

__ Not Approved (Category/ies_____)

Sr. Vice President / Vice Pres. Academic Affairs — Date

Comments:

CS 221: Machine Structures and Programming Lab (1 credit)

Course Description:
This laboratory course complements CS 220, offering students hands-on programming experience to reinforce assembly language programming concepts. Topics include number systems and their rules for arithmetic; basic central processing unit (CPU) organization, instruction formats, addressing modes and their use with a variety of data structures; and parameter passing techniques including the use of a stack frame.

2 lab hours per week.

Corequisites: CS 220

Proposed Text:
Introduction to Assembly Language Programming: For Pentium and RISC Processors, 2nd edition, by Sivarama Dandamudi, Springer, 2004.

Schedule of Topics:

1. Using the programming tools: the editor, MASM, and Link. (1 wk)
2. Writing your first Pentium Assembler program (2 wks)
3. Obtaining keyboard characters. (2 wks)
4. Memory architecture and addressing modes. (1 wk)
5. Video Hardware programming (2 wks)
6. Input and output programming (1 wk)
7. Direct access to video memory and memory mapped displays. (2 wks)
8. Programming the interrupt system (2 wks)
9. Serial communications (1 wk)
10. Disk operations. (1 wk)

Student Outcomes.
Students who complete this course will be able to:

1) Describe the basic architecture of a modern microprocessor
2) Express numbers in the decimal, binary, and hexadecimal number systems
3) Describe the implementation of two's complement number representation on typical machines
4) Describe typical methods used to encode standard data types so that they may be stored and manipulated at the machine level.
5) Demonstrate methods of accessing information in machine memory using direct or indirect addressing schemes.
6) Describe how modern microprocessors interface with externally-connected hardware and I/O devices.
7) Be well acquainted with the stack (LIFO) data structure and use stack instructions and stack frames where appropriate at the machine level.
8) Demonstrate how to set up standard data structures (such as arrays) in computer memory and explain how these structures are accessed at the machine level.
9) Translate high-level programming languages (HLLs) and their source statements to corresponding machine language

Grades will be assigned based on exams and assignments.

Required Resources & Departmental Staffing:

Resources currently in place within the department, the college, and the university library will support this new course. No new resources are required.

There is no impact on staffing requirements.