

07153



Minnesota State University, Mankato HOLD and CLEAR buttons only compatible with Acrobat V. 4 and 5 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.

		(Check all that apply):		Proposal #	300
College:	Science, Engineering and Technology	<input checked="" type="checkbox"/>	Undergraduate	Effective Date of Change:	
Department:	Computer Science	<input checked="" type="checkbox"/>	Graduate	Academic Year	06-07
Program:	Computer Science	CIP # 11.010104		(For Office Use Only)	
Type of Change	COURSE PROPOSALS		Course Designator and Number		
Proposed:	New Course		Number of Credits		
Title Current:					
Title Proposed:	Operating Systems: Design & Implementation		CS 460/560		
24-Char. Abbrev:	Op Systems Des & Imp		3		
			(if applicable)		

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

This course studies historical and current concepts and implementations of computer operating systems. Basic operating systems topics include processes, interprocess communication, interprocess synchronization, deadlock, memory allocation, segmentation, paging, resource allocation, scheduling, file systems, storage, devices, protection, security, and privacy.

Pre: CS 210 and CS 320

Spring

Reason for change:

This is part of the CS program redesign and includes material from COMS 460.

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.

Attach paper copies of the following:

- Syllabus or course outline.
- Course's student learning outcomes associated with each GE competency or CD designation.
- List of strategies to be used to assess students' achievement of each GE competency or CD designation.

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.)

For New Courses

(Check all that apply):	Instructional Type:	Lecture	Course will be offered:
<input type="checkbox"/> Course is an elective.	Grading Format:	<input checked="" type="checkbox"/> Grade <input type="checkbox"/> P/N	<input type="checkbox"/> Fall Semester
<input checked="" type="checkbox"/> Course is required for program		Computer Science	<input checked="" type="checkbox"/> Spring Semester
<input checked="" type="checkbox"/> Pre- or Co-requisites:		Prerequisites: CS 210 and CS 320	<input type="checkbox"/> Summer Session
<input type="checkbox"/> Other courses are being changed or eliminated. (Explain.)			

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.)

Attach paper copies of the following:

- Syllabus or course outline.
- Course's student learning outcomes.
- A list of resources required to offer and support this course.
- A description of how teaching this course will affect department staffing.
- If 400/500 level course, an explanation of added expectations of graduate students.



Minnesota State University, Mankato
Curriculum Proposal

Signature Page

Department

Recommended (Category/ies _____)
 Not Recommended (Category/ies _____)

David A. Agli 10/17/06
Department Chair Date

Comments:

College Curriculum Committee

Recommended (Category/ies _____)
 Not Recommended (Category/ies _____)

Kenn C. Chon 11/2/06
Committee Chair Date

Comments:

College Dean

Recommended (Category/ies _____)
 Not Recommended (Category/ies _____)

John J. [Signature] 11/6/06
Dean Date

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 _____)

[Signature] 1-31-07
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 _____)

[Signature] 2/9/07
Assistant Vice President Date

Comments:

Senior Vice President and Vice President for Academic Affairs

Approved (Category/ies _____)
 Not Approved (Category/ies _____)

[Signature] 2/13/07
Sr. Vice President / Vice Pres. Academic Affairs Date

Comments:

CS 460: Operating Systems Design and Implementation (3 credits)

Course Description:

This course will provide an understanding of the historical and current concepts and implementations of computer operating systems. This course covers basic operating systems concepts including processes, interprocess communication, interprocess synchronization, deadlock, memory allocation, segmentation, paging, resource allocation, scheduling, file systems, storage, devices, protection, security, and privacy.

3 lecture hours per week.

Prerequisites: CS 210, CS 320

Proposed Text:

Operating Systems: Internals and Design Principles, 5th Edition by William Stallings; Prentice Hall, 2004.

Schedule of Topics:

- 1) Processes (~ 2.5 wks)
- 2) Threads (~ 2.5 wks)
- 3) Deadlock (~ 2.5 wks)
- 4) Scheduling (~ 2.5 wks)
- 5) Memory Management (~ 2.5 wks)
- 6) I/O (~ 1 wk)
- 7) File Systems (~ 1.5 wks)

Student Outcomes:

Students who complete this course will be able to:

- 1) Describe the major differences between generic batch, interactive, real-time, and timesharing operating systems.
- 2) Describe the basic issues of concurrency (synchronization, mutual exclusion), using processes and threads as basic units.
- 3) Analyze and construct correct solutions for common concurrent programming problems.
- 4) Describe how the various interrupt handlers process interrupts and effect state changes.
- 5) Calculate average wait time, turnaround time, and throughput for processes using various scheduling algorithms.
- 6) Design and implement mutual exclusion routines that use software only, machine instructions, and semaphores.
- 7) Describe the four necessary conditions for deadlock to occur. Produce a directed resource graph and use graph reduction to determine if deadlock exists.
- 8) Use Bankers Algorithm to determine safe resource allocation.
- 9) Evaluate paging algorithms for efficiency using page fault frequencies.
- 10) Evaluate disk scheduling algorithms by calculating total seek times.
- 11) Compare the various protection and security measures used by major operating systems.

Added Expectations of Graduate Students

- 1) Graduate students will be held to a higher standard in all coursework, including assignments and exams.
- 2) Graduate students will also be expected to perform in depth and thorough independent investigation of the subject matter.

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.