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.

<table>
<thead>
<tr>
<th>College: Science, Engineering and Technology</th>
<th>Proposal #: 324</th>
</tr>
</thead>
<tbody>
<tr>
<td>Department: Computer Science</td>
<td>Effective Date of Change:</td>
</tr>
<tr>
<td>Program: Computer Science</td>
<td>2007-07</td>
</tr>
<tr>
<td>CIP #: 11.010104</td>
<td>(For Office Use Only)</td>
</tr>
</tbody>
</table>

Type of Change: COURSE PROPOSALS

Proposed: New Course

Title: Advanced Programming Practices


Course Designator: CS 480/580

Number of Credits: 3

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

This course covers advanced programming for general-purpose software development. Topics include tools and processes appropriate for employing object-oriented designs and programming within a significant software development environment and advanced data structures and algorithms, graphical user interfaces, and software development processes.

Pre: CS 300 and CS 380

This is part of the CS program redesign. Offerings of course electives will be on a two-year variable rotation.

***For General Education or Cultural Diversity Courses Only***

**General Education Course:**

<table>
<thead>
<tr>
<th>GE Category #</th>
<th>GE Category Name (Maximum of 3 Categories)</th>
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<tbody>
<tr>
<td>N/A</td>
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<td>N/A</td>
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</table>

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:

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***

<table>
<thead>
<tr>
<th>Instructional Type: Lecture</th>
<th>Course will be offered:</th>
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<tr>
<th>(Check all that apply:)</th>
<th>Grading Format:</th>
<th>Course will be offered:</th>
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</thead>
<tbody>
<tr>
<td>Course is an elective.</td>
<td>Grade</td>
<td>Fall Semester</td>
</tr>
<tr>
<td>Course is required for program</td>
<td>P/N</td>
<td>Spring Semester</td>
</tr>
<tr>
<td>Pre- or Co-requisites: Computer Science</td>
<td></td>
<td>Summer Session</td>
</tr>
<tr>
<td>Prerequisites: CS 300 and CS 380</td>
<td></td>
<td></td>
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</tbody>
</table>

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:

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.

Revised September 2002
Minnesota State University, Mankato
Curriculum Proposal

***Signature Page***

Department
✓ Recommended
__ Not Recommended

Comments:

College Curriculum Committee
✓ Recommended
__ Not Recommended

Comments:

College Dean
✓ Recommended
__ Not Recommended

Comments:

General Education Subcommittee
✓ Recommended
__ Not Recommended

Comments:

Undergraduate Curriculum and Academic Policy Committee
✓ Recommended
__ Not Recommended

Comments:

Faculty Association Graduate Committee
✓ Recommended
__ Not Recommended

Comments:

Graduate Dean
✓ Recommended
__ Not Recommended

Comments:

Academic Affairs Council
✓ Recommended
__ Not Approved

Comments:

Senior Vice President and Vice President for Academic Affairs
✓ Approved
__ Not Approved

Comments:

Revised September 2002
CS 480: Advanced Programming Practices (3 credits)

Course Description:
The course provides the student with advanced instruction in programming with an object oriented programming language. The course objective is proficiency in the use of object oriented constructs for general purpose software development. The student will be introduced to tools and processes appropriate for employing object-oriented designs and programming within a significant software development environment. Students will acquire advanced knowledge and experience with object-oriented programming, data structures and algorithms, graphical user interfaces, and software development processes.

3 lecture hours per week.

Prerequisites: CS 300 and CS 380

Proposed Text:

Schedule of Topics:
1) Object Oriented Language Fundamentals (~ 1 wk)
2) Objects and Classes (~ 2 wks)
3) Concurrency (~ 2 wks)
4) Graphical User Interfaces (~ 2 wks)
5) Advanced Data Structures and Algorithms (~ 2 wks)
6) Software Engineering Practices (~ 2 wks)
7) Personal Software Process and Refinement (~ 2 wks)
8) Enacting and Analyzing Software Processes (~ 2 wks)

Student Outcomes:
Students who complete this course will be able to:
1) Apply good software engineering practices in the design and development of object-oriented programs.
2) Accurately measure software size and effort using statistical methods.
3) Apply the Personal Software Process by to develop detailed, accurate, and reliable software engineering plans.
4) Follow a development plan by tracking progress and identifying resource, schedule, and quality problems.
5) Describe the concepts and features of object-oriented programming.
6) Apply knowledge of information hiding, inheritance, and polymorphism to design and implement classes.
7) Describe the common graphical components used in GUI design by designing and implementing an application using GUI input and output.
8) Describe the key concepts and application of concurrent programming. Design and implement a multithreaded program.
9) Gain additional experience in designing, analyzing, and implementing data structures and algorithms.

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.