UNIVERSITY OF MARY WASHINGTON – PROGRAM CHANGE PROPOSAL

Electronically submit this completed form with attachments to the Chair of the College Curriculum Committee.

<table>
<thead>
<tr>
<th>COLLEGE (check one):</th>
<th>Arts and Sciences</th>
<th>Business</th>
<th>Education</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proposal Submitted By:</td>
<td>Ian Finlayson</td>
<td>Date Prepared: October 11, 2012</td>
<td></td>
</tr>
<tr>
<td>Department /Program:</td>
<td>Computer Science</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: for any program change entailing the addition any new courses, or revisions to existing courses, separate proposal for those course actions must also be submitted.

PROPOSAL TO CHANGE EXISTING PROGRAM (check one of the following)

- Revise requirements for existing major [X]
- Revise requirements for a concentration within an existing major
- Revise requirements for an existing degree program
- Revise requirements for existing certificate program
- Revise requirements for existing minor

Implementation Date: FALL semester, year: Fall 2013

REQUIRED ATTACHMENTS FOR CHANGES TO EXISTING PROGRAMS:

1. Rationale statement (Why is this program change needed? What purposes will it serve?)
2. Impact Statement (Provide details about the Library, space, budget, technology, and impacts created by this program change. Supporting statements from the Library, IT Department, etc. evaluating the resource impact and feasibility of the program change are required.)
3. Catalog Copy (Provide the existing Catalog Description and the complete statement of the proposed new Catalog description that reflects the program changes)

PROPOSAL TO CREATE PROGRAM NOT REQUIRING STATE ACTION (check one of the following)

- New concentration within existing major
- New minor
- New Major but NOT a new degree*

*Use ONLY for interdisciplinary majors that will be grouped as part of the “Special Majors/General Liberal Arts and Sciences” degree (CIP Code 24.0101) or reported as a BLS degree (CIP Code 24.0199)

Implementation Date (semester and year):

REQUIRED ATTACHMENTS FOR NEW PROGRAMS NOT REQUIRING STATE APPROVAL:

1. Rationale statement (Why is this additional program needed? What purposes will it serve?)
2. Impact Statement (Provide details about the Library, space, budget, technology, and impacts created by this program change. Supporting statements from the Library, IT Department, etc. evaluating the resource impact and feasibility of adding the new program are required.)
3. Catalog Copy (Provide the complete Catalog Description for the proposed new program)

Department Chair Approval: Jennifer Polack-Wahl Date: 10/31/12
CCC Chair Approval: Bradley Hansen Date: 11/9/12
Dean Approval: Richard Finkelstein Date: 12/1/12
UCC Chair Approval: Date: 

*Provost Approval: Date: 

*Required only in cases of proposals for new concentrations, new minors, or new majors that do not involve a new degree
Proposal to Change the Requirements for the Computer Science Major

October 11, 2012

Contents

1 Rationale Statement 1
2 Impact Statement 2
3 Transition Plan 2
4 Current Major Requirements 3
5 Proposed Major Requirements 6

1 Rationale Statement

The primary requirement change being proposed is to require the Software Engineering course, CPSC 430, for all Computer Science majors. In the existing major requirements, students can elect whether to take this course, an individual study (CPSC 491), or an internship (CPSC 499). CPSC 430 introduces students to techniques for designing computer software, managing large-scale software projects, and provides experience in working with groups on an extended project.

While individual studies and internships are certainly good experiences for any student, we feel that the material in the software engineering course is important for all computer science majors. The majority of graduates with a computer science degree will work in software development where having a working knowledge of software design techniques and project management, and having experience developing a sizable software project with a team will be very valuable.
This change will be made for the traditional computer science track, as well as the computer information systems (CIS) track, but not for the geographic information systems (GIS) track. The rationale for omitting the GIS track is that GIS development is typically not done on such a large scale as most other types of software development. As such, having the software engineering course will be of less necessity to those students.

This change also fixes a couple of spelling errors in the current requirements.

2 Impact Statement

There will be practically no impact of this program change on any university resources. Most students already take the software engineering course, so it is already frequently offered.

3 Transition Plan

This change would go into effect at the start of the 2013 academic year when the next academic catalog is printed. Students who have declared a major in computer science prior to this point will still have the option of graduating under the existing catalog, so they will be able to substitute CPSC 491 or CPSC 499 in place of CPSC 430. New computer science majors, however, will be required to take CPSC 430.
4 Current Major Requirements

Computer Science Major Requirements
Students who major in Computer Science may choose from three concentrations: the Traditional Program, the Computer Information Systems Concentration, or the Geographic Information Systems Concentration.

1. The Traditional Program.
Students study the classic discipline of Computer Science, with emphasis on the theoretical foundation and practical applications of computers and computer software. Courses explore such subjects as system architecture, object-oriented design, and computational theory, in addition to the rich mathematical underpinnings that support these topics. Graduates are well-equipped to solve problems in a broad spectrum of application areas and begin satisfying careers as software engineers, system architects, or application developers.

Computer Science: Traditional Program 40 credits as follows:

A. The following required courses: Computer Science 220, 230, 305, 326, 330, 350, 401, and 405.

B. One course chosen from Mathematics 300 or 312 or 351.

C. One course chosen from Computer Science 430 or 491 (3 credits) or 499 (3 credits).

D. One course, minimum three credits, in Computer Science numbered 400 or higher (except Computer Science 499) that was not used to satisfy any of the preceding requirements. Computer Science 491 fulfills this requirement if said course is at least three credits.

E. One course, minimum three credits, in Computer Science or Mathematics numbered 300 or higher that was not used to satisfy any of the preceding requirements. Computer Science 391, 491, or 499 fulfills this requirement if said course is at least three credits.

A maximum of 3 credits of Computer Science 499 can be counted toward the Computer Science major. Note that Mathematics 122 (Calculus II) is a prerequisite for Computer Science 326 and should be taken before the junior year. Also, note that Computer Science 125 is a prerequisite for Computer Science 305 and 326 and should be taken before the junior year.

2. The Computer Information Systems Concentration in Computer Science.
This combines the foundations of Computer Science with an applied approach to application development and computing in a business environment. It offers our students an avenue to consider the use of computing as it applies to problems in business and related fields. Together with courses in economics, decision support, and accounting, this alternative focuses on how technology applies in an organizational setting. Graduates are well-positioned for careers as software developers, systems analysts, network and systems administrators, project leaders, database administrators, or business analysts.
Computer Science: CIS Concentration 43 credits as follows:

A. The following required courses: Computer Science 220, 230, 310, 330, 350; Business Administration 132; Economics 200 or higher; and Mathematics 200.

B. One course chosen from Business Administration 300 or 353.

C. One course chosen from Computer Science 414 or 448.

D. One course chosen from Computer Science 430 or 491 (3 credits) or 499 (3 credits).

E. One course, minimum three credits, in Computer Science numbered 400 or higher (except Computer Science 499) that was not used to satisfy any of the preceding requirements. Computer Science 491 fulfills this requirement if said course is at least three credits.

F. One course, minimum three credits, in Computer Science, Business Administration or Mathematics numbered 300 or higher that was not used to satisfy any of the preceding requirements. Computer Science 391, 491, or 499 fulfills this requirement if said course is at least three credits.

A maximum of 3 credits of Computer Science 499 can be counted toward the Computer Science major. Note that Computer Science 125 is a prerequisite to Computer Science 414 and should be taken before the junior year. Business Administration 131 is a prerequisite for Business Administration 132.

3. The Geographic Information Systems Concentration in Computer Science.
The GIS concentration combines the foundations of Computer Science with specialized study of geospatial information systems. This program is designed to address the need for customized desktop and web-based applications related to business, geospatial intelligence, education, health care, and numerous other employment fields. The field encompasses integrated hardware, software, and database systems that are capable of capturing, storing, analyzing, and displaying geographic information.

Computer Science: GIS Concentration 41 credits as follows:

A. The following required courses: Computer Science 220, 230, 330, 350; GISC 351 and 450.

B. One course selected from: GISC 220 or Geography 250 or Environmental Science/Geology 205.

C. One course selected from: GISC 440 or 460 or 471 or 491.

D. One course, minimum three credits, in Computer Science numbered 400 or higher (except Computer Science 499) that was not used to satisfy any of the preceding requirements. Computer Science 491 fulfills this requirement if said course is at least three credits.
E. Two courses, minimum six credits, in Computer Science numbered 300 or higher that was not used to satisfy any preceding requirements. Computer Science 391, 491, or 499 fulfills this requirement if said course is at least three credits.

F. One course, minimum 3 credits, chosen from Computer Science 430 (4 credits), 491, or 499. A maximum of 3 credits of CPSC 499 can be counted toward the CPSC major.

Computer Science Minor Requirements (20 credits):

Any Computer Science course, of at least 3 credits, numbered 100 or higher; Computer Science 220 and 230; any three (3) Science courses numbered 300 or above, for a total of at least 9 credits.
5 Proposed Major Requirements

Computer Science Major Requirements

Students who major in Computer Science may choose from three concentrations: the Traditional Program, the Computer Information Systems Concentration, or the Geographic Information Systems Concentration.

1. The Traditional Program.
Students study the classic discipline of Computer Science, with emphasis on the theoretical foundation and practical applications of computers and computer software. Courses explore such subjects as system architecture, object-oriented design, and computational theory, in addition to the rich mathematical underpinnings that support these topics. Graduates are well-equipped to solve problems in a broad spectrum of application areas and begin satisfying careers as software engineers, system architects, or application developers.

Computer Science: Traditional Program 40 credits as follows:

A. The following required courses: Computer Science 220, 230, 305, 326, 330, 350, 401, 405 and 430.

B. One course chosen from Mathematics 300 or 312 or 351.

C. One course, minimum three credits, in Computer Science numbered 400 or higher (except Computer Science 499) that was not used to satisfy any of the preceding requirements. Computer Science 491 fulfills this requirement if said course is at least three credits.

D. One course, minimum three credits, in Computer Science or Mathematics numbered 300 or higher that was not used to satisfy any of the preceding requirements. Computer Science 391, 491, or 499 fulfills this requirement if said course is at least three credits.

A maximum of 3 credits of Computer Science 499 can be counted toward the Computer Science major. Note that Mathematics 122 (Calculus II) is a prerequisite for Computer Science 326 and should be taken before the junior year. Also, note that Computer Science 125 is a prerequisite for Computer Science 305 and 326 and should be taken before the junior year.

2. The Computer Information Systems Concentration in Computer Science.
This combines the foundations of Computer Science with an applied approach to application development and computing in a business environment. It offers our students an avenue to consider the use of computing as it applies to problems in business and related fields. Together with courses in economics, decision support, and accounting, this alternative focuses on how technology applies in an organizational setting. Graduates are well-positioned for careers as software developers, systems analysts, network and systems administrators, project leaders, database administrators, or business analysts.
Computer Science: CIS Concentration 43 credits as follows:

A. The following required courses: Computer Science 220, 230, 310, 330, 350, 430; Business Administration 132; Economics 200 or higher; and Mathematics 200.

B. One course chosen from Business Administration 300 or 353.

C. One course chosen from Computer Science 414 or 448.

D. One course, minimum three credits, in Computer Science numbered 400 or higher (except Computer Science 499) that was not used to satisfy any of the preceding requirements. Computer Science 491 fulfills this requirement if said course is at least three credits.

E. One course, minimum three credits, in Computer Science, Business Administration or Mathematics numbered 300 or higher that was not used to satisfy any of the preceding requirements. Computer Science 391, 491, or 499 fulfills this requirement if said course is at least three credits.

A maximum of 3 credits of Computer Science 499 can be counted toward the Computer Science major. Note that Computer Science 125 is a prerequisite to Computer Science 414 and should be taken before the junior year. Business Administration 131 is a prerequisite for Business Administration 132.

3. The Geographic Information Systems Concentration in Computer Science.
The GIS concentration combines the foundations of Computer Science with specialized study of geospatial information systems. This program is designed to address the need for customized desktop and web-based applications related to business, geospatial intelligence, education, health care, and numerous other employment fields. The field encompasses integrated hardware, software, and database systems that are capable of capturing, storing, analyzing, and displaying geographic information.

Computer Science: GIS Concentration 41 credits as follows:

A. The following required courses: Computer Science 220, 230, 330, 350; GISC 351 and 450.

B. One course selected from: GISC 220 or Geography 250 or Environmental Science/Geology 205.

C. One course selected from: GISC 440 or 460 or 471 or 491.

D. One course, minimum three credits, in Computer Science numbered 400 or higher (except Computer Science 499) that was not used to satisfy any of the preceding requirements. Computer Science 491 fulfills this requirement if said course is at least three credits.

E. Two courses, minimum six credits, in Computer Science numbered 300 or higher that was not used to satisfy any preceding requirements. Computer Science 391, 491, or 499 fulfills this requirement if said course is at least three credits.
F. One course, minimum 3 credits, chosen from Computer Science 430 (4 credits), 491, or 499.
A maximum of 3 credits of CPSC 499 can be counted toward the CPSC major.

Computer Science Minor Requirements (20 credits):

Any Computer Science course, of at least 3 credits, numbered 100 or higher; Computer Science 220 and 230; any three (3) Science courses numbered 300 or above, for a total of at least 9 credits.