TRANSMITTAL for UNDERGRADUATE PROGRAMS: Changes or Proposals

INFORMATION

1. Program title: Computer Science (Cs)
2. Department(s): Computer Science And Information Systems (Csis)
3. College(s): Cbe
4. Proposal prepared by: Hossein Najafi Date: 12/3/2012

5. Check all that apply:
   - [ ] New program
   - [ ] Change in course name
   - [x] Change in Major
   - [ ] Change in course content
   - [x] Existing program
   - [x] Change in number of credits
   - [x] Change in Minor
   - [x] Change in Emphasis/Option

6. Other Programs/Departments Consulted (Requires letters of support from all Departments or Programs substantially affected):
   1. Math
   2. Geography
   3. Geography
   4. Geography

7. Date of Implementation: Fall Semester 2013 Year

8. Have all courses in this program been approved? Yes [x] No [ ] If “No,” which ones?

9. Attach Request Narrative. (Include description of program before and after proposed changes).

UNIT APPROVALS: Requires signatures of all Departments Chairs and Deans whose programs will be affected by the changes or proposal. Signature lines for the affected Departments and Colleges (Noted in 6 above), are on the back of this form. These signatures should be obtained prior to review by all other shared governance levels.

<table>
<thead>
<tr>
<th>Signature</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Department Chair</td>
<td>2/8/13</td>
</tr>
<tr>
<td>College Curriculum Cmtn. Chair</td>
<td>2/8/13</td>
</tr>
<tr>
<td>Dean of College</td>
<td>2/11/13</td>
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<tr>
<td>University Curriculum Cmtn. Chair</td>
<td>3/12/13</td>
</tr>
<tr>
<td>Academic Policy &amp; Programs Cmtn. Chair</td>
<td>4/2/13</td>
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<tr>
<td>Faculty Senate Chair</td>
<td>4/2/13</td>
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<tr>
<td>Provost / Vice Chancellor</td>
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<tr>
<td>Chancellor</td>
<td>4/2/13</td>
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NOTE: The master copy of this transmittal and accompanying documents must be filed in the Provost’s office upon final approval. The Provost’s office will notify all appropriate administrative offices [Registrar, Dean(s), and Department Chair(s)] of approvals and necessary actions to implement changes.

Rev. 11/08
TRANSMITTAL for UNDERGRADUATE PROGRAMS: Changes or Proposals

DEPARTMENT & COLLEGE APPROVAL SIGNATURES

Department Chair ________________________________ Signature ____________________________ Date 12/5/2012

College Curriculum Cmtt. Chair ____________________________

Dean of College ____________________________

__________________________________________________________

Department Chair ________________________________ Signature ____________________________

College Curriculum Cmtt. Chair ____________________________

Dean of College ____________________________

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Department Chair ________________________________ Signature ____________________________

College Curriculum Cmtt. Chair ____________________________

Dean of College ____________________________

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Rev. 11/08
Proposal for Revision of the Computer Science and Information Systems Curriculum – The Computer Science (CS) Program Option
Hossein Najafi, Anthony Varghese

Rationale

_Benchmark:_ The Association for Computing Machinery (ACM) is the principal organization of computer scientists and members of computing-related fields. Once per decade, the ACM releases a report on undergraduate computing curriculum with recommendations for programs that grant degrees in computer science. Due to the fast changing nature of the discipline, ACM also releases an Interim Review Recommendation approximately once every five years.

The committees generating such reports are composed of computer science educators from across the discipline at research universities, liberal arts colleges, and other types of schools. The UWRF Computer Science and Information Systems (CSIS) Department takes the ACM recommendations seriously and attempts to keep its curriculum in line with the most recent guidelines. The last time the CSIS department revised its CS program was in 2008, based on _ACM 2008 guidelines_ (ACM 2008 guidelines). The revisions presented here are aimed to align the CS program with the _ACM 2013 Review_ (ACM 2013 guidelines).

The following areas were identified by the department for revision to better align the program with the new ACM 2013 guidelines:

* _Project Experience:_ It is recommended that graduates should be involved in at least one substantial project.

* _Program flexibility:_ Given the diverse nature of the discipline, program flexibility both at the required core and electives is recommended.

Curricular Revision Recommendations based on ACM 2013 Guidelines

_Project Experience:_ To address the recommendation on project experience, the department is proposing the following changes:

- Convert CSIS 484 into a 3 credits Senior Capstone Course

- Make Internship semi-required. Students will be required to either complete an internship or take the CSIS 484 capstone course.

_Program flexibility:_ To address the recommendation on project flexibility, the department is proposing the following changes:

- Make CSIS 425 an elective course, instead of required.

- Make Internship semi-required. Students will be required to either complete an internship or take the CSIS 484 capstone course. This offers flexibility, since many students used the internship as one of their electives, leaving only 3 credits of true electives.

- Change the directed electives requirements to state “To be selected from 200-400 CSIS-CS option courses (excludes CSIS 215). In consultation with their advisor, students may take up to 3 credits from CSIS 423 or CSIS 440, Math 346, Math 347 or GIS 250.”

- Change the math requirement from “Math166, Math 236” to “Math156 or Math 166, Math 236”.

1
Current CSIS Major – CS Program Option Requirements
Total Credits: 55

A. Required Courses: 40 Cr. hrs.
   a. CSIS 161 Programming I 3 Cr.
   b. CSIS 162 Programming II 3 Cr.
   c. CSIS 225 Web Development I 3 Cr.
   d. CSIS 235 Object Oriented Programming 3 Cr.
   e. CSIS 237 Data Structure and Algorithm 3 Cr.
   f. CSIS 247 Introduction to Computer Networks 3 Cr.
   g. CSIS 248 Operating Systems Programming 3 Cr.
   h. CSIS 333 Database Management Systems 3 Cr.
   i. CSIS 343 Software Engineering & Capstone Project 3 Cr.
   j. CSIS 355 Computer Organization and Assembly Language 3 Cr.
   k. CSIS 425 Multi-Tier Web-Enabled Software Systems 3 Cr.
   l. CSIS 429 Operating Systems and System Programming 3 Cr.
   m. CSIS 435 Computer and Information Security 3 Cr.
   n. CSIS 484 Seminar (writing intensive) 1 Cr.

A. Directed Electives: 6 Cr. hrs.
   a. To be selected from 200-400 CSIS courses in consultation with adviser.

B. Required supporting courses: 9 Cr. hrs.
   a. Math 166, Math 236 8 Cr total
   b. CBE 100, CBE 300 1 Cr. total
Proposed CSIS Major – CS Program Option Requirements

Total Credits: 56-57

A. Required Courses: 39 Cr. hrs.

a. CSIS 161 Programming I 3 Cr.
b. CSIS 162 Programming II 3 Cr.
c. CSIS 225 Web Development I 3Cr.
d. CSIS 235 Object Oriented Programming 3 Cr.
e. CSIS 237 Data Structure and Algorithm 3 Cr.
f. CSIS 247 Introduction to Computer Networks 3 Cr.
g. CSIS 248 Operating Systems Programming 3 Cr.
h. CSIS 333 Database Management Systems 3 Cr.
i. CSIS 343 Software Engineering & Capstone Project 3 Cr.
j. CSIS 355 Computer Organization and Assembly Language 3 Cr.
k. CSIS 429 Operating Systems and System Programming 3 Cr.
l. CSIS 435 Computer and Information Security 3 Cr.
m. CSIS 484 Capstone Seminar, or CSIS 379 Internship in Computer Science 3 Cr.

C. Directed Electives: 9 Cr. hrs.

a. To be selected from 200-400 CSIS-CS option courses (excludes CSIS 215). In consultation with their advisor, students may take up to 3 credits from CSIS 423 or CSIS 440, Math 346, Math 347 or GIS 250.

D. Required supporting courses: 8-9 Cr. hrs.

a. Math 156 or Math 166, Math 236 7-8 Cr total
b. CBE 100, CBE 300 1Cr. total
Current CSIS Minor – CS Program Option Requirements
Total Credits: 32

A. Required Courses: 18 Cr. hrs.

a. CSIS 161 Programming I 3 Cr.
b. CSIS 162 Programming II 3 Cr.
c. CSIS 235 Object Oriented Programming 3 Cr.
d. CSIS 247 Introduction to Computer Networks 3 Cr.
e. CSIS 333 Database Management Systems 3 Cr.
f. CSIS 355 Computer Organization and Assembly Language 3 Cr.

B. Directed Electives: 6 Cr. hrs.

a. To be selected from 200-400 CSIS courses in consultation with adviser.

C. Required supporting courses: 8 Cr. hrs.

a. Math 166, Math 236
Proposed CSIS Minor – CS Program Option Requirements
Total Credits: 31-32

A. Required Courses: 18 Cr. hrs.
   a. CSIS 161 Programming I 3 Cr.
   b. CSIS 162 Programming II 3 Cr.
   c. CSIS 225 Web Development I 3 Cr.
   d. CSIS 235 Object Oriented Programming 3 Cr.
   e. CSIS 247 Introduction to Computer Networks 3 Cr.
   f. CSIS 333 Database Management Systems 3 Cr.

E. Directed Electives: 6 Cr. hrs.
   a. To be selected from 200-400 CSIS courses in consultation with adviser (excludes CSIS 215). In consultation with their advisor, students may take up to 3 credits from CSIS 423 or CSIS 440, Math 346, Math 347 or GIS 250.

F. Required supporting courses: 7-8 Cr. hrs.
   a. Math 156 or Math 166, Math 236 8 Cr total
Dear Alex,

You should be receiving a package with Computer Science and Information Systems program changes that were approved by the CBE curriculum committee last Friday. The following are a couple of emails from the Math and Geography chairs in support of these changes.

Please let me know if you need any other supporting documents or have any questions about the proposed changes. I like to attend the meeting in case there are questions from the committee. Please let me know when we are on the agenda.

Regards,

Hossein Najafi, PhD  
Computer Science and Information Systems Department, Chair  
University of Wisconsin, River Falls  
410 S. 3rd St.  
River Falls, WI 54022  
715-425-3335

Geography Support email:

Hossein,

On behalf of the Geography and Mapping Sciences Department, we have discussed your proposed changes for the CSIS CS and IS majors. We support and recommend the inclusion of GEOG 250 – Introduction to GIScience in these majors. We look forward to working with your students.

Sincerely,

Charlie

Charles P. Rader, Ph.D.  
Professor  
Department of Geography and Mapping Sciences  
University of Wisconsin – River Falls  
410 S. 3rd Street  
River Falls, WI 54022  
715-425-3264 (Office)  
715-425-0643 (Fax)  
charles.p.rader@uwrf.edu

Math support email:
From: Robert Coffman <robert.l.coffman@uwrf.edu>
Date: Wednesday, December 5, 2012 2:42 PM
To: Hossein Najafi <hossein.najafi@uwrf.edu>
Subject: RE: CSIS program changes

Hi Hossein,

From talking things over with some of my staff, I would say that the Math Department is willing to support your proposal. I will say, however, that the department does have some concerns. In particular, a number of your CS majors are also math minors, which is a logical combination. As such, then, these CS majors/ math minors have to take MATH 167 to fulfill a requirement for the math minor. If a student starts out in CS by taking MATH 156 and then decides to become a math minor, then he or she ABSOLUTELY MUST take MATH 166 before taking MATH 167. In all of the collective institutional memory of all the staff on our department, no one can recall of even a single student successfully completing MATH 167 coming directly out of MATH 156 without first taking MATH 166.

As such, then, you will need to advise your students carefully if they have any designs on becoming math minors. (Hopefully, the ones that take MATH 156 to fulfill your major requirement will, by self-selection, also be very unlikely to become math minors.)

Respectfully submitted,

Bob Coffman, Chair
Department of Mathematics
University of Wisconsin - River Falls
(715) 425-3326
Hi Jim,

Per my promise, I’m writing you a message to include some comments made by Math regarding the current program change requested by CSIS.

The CSIS Department currently requests:
Change the math requirement from “Math 166, Math 236” to “Math 156 or Math 166, Math 236” for CS majors (bottom of page 1, on the narrative CSIS Major -- CS-option program changes).

Here’s why Math has concerns: If approved as requested, this would allow a CS major to graduate with merely Math 156 & Math 236. Key issue here: Math 156 is a 3-credit, ‘high school level’ Calculus class. The other, Math 166, is a 4-credit, significantly more rigorous, ‘college level’ Calculus class.

1) By not being required to take Math 166, potentially many of the approx. 150 CS majors will never be exposed to a rigorous Calculus class. Such a class (and more) is needed in many engineering fields close to or part of Computer Science (computer engineering, computer graphics, robotics, etc.). Also, this could weaken our CS majors’ credentials in the eyes of a grad school’s admission person.

2) UWRF would become the first institution among the 13 UW-System (4 year degree) schools to lower their math requirements for CS majors below the standard ‘Calc I & Discrete Mathematics’ combo. Most schools actually require their CS majors to take significantly more math courses.

At our UCC meeting of last Friday I conveyed these (and other) concerns to Hossein Najafi, the CSIS Department Chair, and I recommended that he addresses them in front of APP.
Someone from Math can put together a more elaborate document with other potential problems related to the requested change. But there may be no use for one if, (per Hossein), the CSIS is thinking of dropping this request from their program change.

Please let me know if you have any questions.

Best,

Alex