February 9, 2011

MEMORANDUM

TO: Steve Halperin
   Dean, College of Computer, Mathematical and Natural Sciences

FROM: Elizabeth Beise
       Associate Provost for Academic Planning and Programs

SUBJECT: Proposal to Modify the Curriculum of the BS in Computer Science (PCC log no.10037).

On February 4, 2011, the Senate PCC committee approved your proposal to modify the curriculum of the BS in Computer Science. A copy of the approved agreement is attached.

The change is effective Fall 2011. The College should ensure that the change is fully described in the Undergraduate Catalog and in all relevant descriptive materials, and that all advisors are informed.

MDC/

Enclosure

cc: David Salness, Chair, Senate PCC Committee
    Sarah Bauder, Office of Student Financial Aid
    Reka Montfort, University Senate
    Erin Howard, Data Administration
    Donna Williams, Institutional Research & Planning
    Anne Turkos, University Archives
    Linda Yokoi, Office of the Registrar
    James Dietz, Undergraduate Studies
    Paul Smith, College of Computer, Mathematical and Natural Sciences
    Larry Davis, Computer Science
THE UNIVERSITY OF MARYLAND, COLLEGE PARK
PROGRAM/CURRICULUM/UNIT PROPOSAL

- Please email the rest of the proposal as an MSWord attachment to pcc-submissions@umd.edu.
- Please submit the signed form to the Office of the Associate Provost for Academic Planning and Programs, 1119 Main Administration Building, Campus.

College/School: College of Computer, Mathematical and Natural Sciences
Please also add College/School Unit Code-First 8 digits: 01203000

Department/Program: Department of Computer Science
Please also add Department/Program Unit Code-Last 7 digits: 1300501

Type of Action:
Curriculum change

Summary of Proposed Action:
The Department of Computer Science proposes that two courses be added to the options from which Computer Science students can choose for their Upper Level Computer Science Requirements. In Area 2, Information Processing, students would now have the option of including an existing course (CMSC 423 - Bioinformatic Algorithms, Databases and Tools). In Area 3, Software Engineering and Programming Languages, students would now have the option of including a course (CMSC 436 - Programming Handheld Systems) which is being made a permanent course after several semesters as a Special Topics offering. Course descriptions are below:

CMSC 423 Bioinformatic Algorithms, Databases, and Tools
An introduction to the main algorithms, databases, and tools used in bioinformatics. Topics may include assembly and analysis of genome sequences, reconstructing evolutionary histories, predicting protein structure, and clustering of biological data. Use of scripting languages to perform analysis tasks on biological data. No prior knowledge of biology is assumed.

CMSC 436 Programming Handheld Systems
Fundamental principles and concepts that underlie the programming of handheld systems, such as mobile phones, personal digital assistants, and tablet computers. Particular emphasis will be placed on concepts such as limited display size, power, memory and CPU speed; and new input modalities, where handled systems differ substantially from non-handheld systems, and thus require special programming tools and approaches. Students will apply these concepts and principles in the context of an existing handset programming platform.

=====================================================================
APPROVAL SIGNATURES - Please print name, sign, and date. Use additional lines for multi-unit programs.

1. Department Committee Chair _____________________ Nov 2, 2010
2. Department Chair _______________________________ 11-10-2010
3. College/School PCC Chair ____________________________ 12/10/10
4. Dean ____________________________
5. Dean of the Graduate School (if required) ____________________________
6. Chair, Senate PCC ____________________________ 2/4/11
7. University Senate Chair (if required) ____________________________
8. Senior Vice President for Academic Affairs & Provost ____________________________ 2/9/2011
Proposal
The Department of Computer Science proposes allowing two new courses to count toward the BS degree.

Rationale
As Computer Science is a constantly- and quickly-evolving discipline, the department must continually evaluate what is the best and most essential information for our students to have to continue to be the innovators of the field, versus what topics are transitory and/or short-lived. None of the proposed course changes will change the number of credits required in the Computer Science Curriculum, they would only broaden the options our students have to complete the existing requirements.

CMSC 423, Bioinformatic Algorithms, Databases and Tools has been taught here at the University of Maryland for several years by several different faculty, and has been used as an Upper Level Computer Science Elective by Computer Science students before now. As Bioinformatics is growing in application and importance in the field of Computer Science, it is appropriate that the course now be used as an option in the Information Processing Area of Concentration.

CMSC 436, Programming Handheld Systems, has been developed in the last year, and taught for the last two semesters with a platform-specific (either iPhone or Android) focus. It is clear that handheld devices will be, in their continually-evolving forms, a common element of everyday life in the future. As programming these devices offers its own unique challenges new to the field of Computer Science, it is appropriate that the course be included as a permanent option in the Software Engineering and Programming Languages Area of Concentration.

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<tr>
<th>Current Requirements</th>
<th>Proposed Requirements</th>
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<tr>
<td><strong>Students select 5 courses from at least 3 of the Areas of Concentration below (requirement remains the same)</strong></td>
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<tr>
<td><strong>Area 1: Systems (up to 2 courses)</strong></td>
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<td>CMSC 411</td>
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<td><strong>Area 2: Information Processing (up to 2 courses)</strong></td>
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<td>or CMSC 427</td>
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<td><strong>Area 3: Software Engineering and Programming Languages (up to 2 courses)</strong></td>
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<td>CMSC 430</td>
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<td><strong>Area 4: Theory (up to 2 courses)</strong></td>
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<td>CMSC 451</td>
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<td>or CMSC 456</td>
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<td><strong>Area 5: Numerical Analysis (up to 1 course)</strong></td>
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<td>CMSC 460</td>
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Current Full Requirements for the Major

The course of study for a Computer Science major must include all of the following requirements:

1. A grade of C or better in each of the following courses:

   a. CMSC 131 or a score of 5 on A version of the JAVA Advanced Placement exam or a score of 4 or 5 on the AB version of the JAVA Advanced Placement exam or an acceptable score on the appropriate Department exemption examination, which is to be taken at the time of entry into the program.

   b. CMSC 132 or acceptable score on the appropriate Department exemption examination, which is to be taken at the time of entry into the program.

   c. CMSC 216 or acceptable score on the appropriate Department exemption examination, which is to be taken at the time of entry into the program.

   d. CMSC 250 or acceptable score on the appropriate Department exemption examination, which is to be taken at the time of entry into the program.

   e. At least 27 credit hours at the 300-400 levels. These must include CMSC 330, CMSC 351, and at least 15 credit hours from the following CMSC courses with no more than two courses from a single category:

      Computer Systems: Up to two of 411, 412, 414, 417
      Information Processing: 420, one of 421 or 424 or 426 or 427
      Software Engineering/Programming Languages: Up to two of 430, 433, 434, 435
      Algorithms and Computation Theory: 451, one of 452 or 456
      Numerical Analysis*: One of 460 or 466.

   *Note: Courses in Numerical Analysis require MATH 240 and 241 as additional prerequisites. Students without either of these prerequisites must choose their 15 credit hours from the remaining courses in the other four areas.

3. MATH 140 and 141. A STAT course which has MATH 141 (or a more advanced mathematics course) as a prerequisite, and one other MATH, STAT, or AMSC course which has MATH 141 (or a more advanced mathematics course) as a prerequisite. A grade of C or better must be earned in each of the courses. No course that is cross-listed as CMSC may be counted in this requirement.

4. A minimum of 12 additional credit hours of 300-400 level courses in one discipline outside of computer science with an average grade of C or better. No course that is cross-listed as CMSC may be counted in this requirement. Note: The following general guidelines should be observed when selecting courses for this upper level supporting sequence:

   a. Courses must have all the same four-letter acronym

   b. Each course should be a minimum of 3 credits.

   c. Only 1 special topics or independent study course (such as courses numbered 498 or 499) may be used. Any variations must be approved by the Undergraduate Program Director. No course used to fulfill another requirement (other than CORE Advanced Studies) can be counted in this requirement.
Proposed Full Requirements (changes shown in italics):

The course of study for a Computer Science major must include all of the following requirements:

1. A grade of C or better in each of the following courses:
   
a. CMSC 131 or a score of 5 on A version of the JAVA Advanced Placement exam or a score of 4 or 5 on the AB version of the JAVA Advanced Placement exam or an acceptable score on the appropriate Department exemption examination, which is to be taken at the time of entry into the program.

b. CMSC 132 or acceptable score on the appropriate Department exemption examination, which is to be taken at the time of entry into the program.

c. CMSC 216 or acceptable score on the appropriate Department exemption examination, which is to be taken at the time of entry into the program.

d. CMSC 250 or acceptable score on the appropriate Department exemption examination, which is to be taken at the time of entry into the program.

e. At least 27 credit hours at the 300-400 levels. These must include CMSC 330, CMSC 351, and at least 15 credit hours from the following CMSC courses with no more than two courses from a single category:

   Computer Systems: Up to two of 411, 412, 414, 417
   Information Processing: 420, one of 421 or 423 or 424 or 426 or 427
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   Information Processing: 420, one of 421 or 423 or 424 or 426 or 427
   Software Engineering/Programming Languages: Up to two of 430, 433, 434, 435, 436
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   Software Engineering/Programming Languages: Up to two of 430, 433, 434, 435, 436
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   c. Only 1 special topics or independent study course (such as courses numbered 498 or 499) may be used. Any variations must be approved by the Undergraduate Program Director. No course used to fulfill another requirement (other than CORE Advanced Studies) can be counted in this requirement.

Transition to new curriculum

As soon as approved, student may count these two courses to the major as indicated above.