



Proposal to the Senate Educational Policy Committee

PROPOSAL TITLE:

Establish a Combined Bachelor of Science in Computer Science and Master of Computer Science in the Department of Computer Science, College of Engineering

SPONSOR:

Dr. Rob Rutenbar
Department Head, Computer Science
(217) 333-3373
rutenbar@illinois.edu

COLLEGE CONTACT:

Victoria Coverstone
Associate Dean, Graduate and Professional Programs, College of Engineering
(217) 265-4560
vcc@illinois.edu

BRIEF DESCRIPTION:

The Department of Computer Science requests a new combined Bachelor of Science in Computer Science and Master of Computer Science (B.S.-M.C.S.) degree. Students enrolled in the combined degree program will take a total of 120 hours to complete the B.S. degree and 32 hours (pending approval of the proposal EP.13.18, Revision to the Master of Computer Science (M.C.S.) Degree) to complete the M.C.S. degree.

Program Requirements (see Appendix A for more detail)

The B.S. program in Computer Sciences is comprised of 128 hours of coursework. The M.C.S. program in Computer Science is comprised of 32 hours of coursework. The combined B.S.-M.C.S. degree program would shorten the B.S. degree requirements to 120 credit hours; allowing students enrolled in this program to count three courses and at most 12 credit hours of CS 400-level coursework required for the B.S. degree toward fulfillment of the 12 to 16 credit hour Breadth Requirement of the M.C.S. degree. This combined program takes advantage of a common set of courses that can be applied towards completion of both the M.C.S. program and the B.S. program requirements. CS 400-level courses taken to fulfill this requirement must be taken for graduate credit.

Students in this combined degree program, who have approval from their advisor, may be allowed to complete additional CS graduate-level courses beyond the requirements for their bachelor's degree and transfer up to 12 graduate credit hours of eligible coursework to their M.C.S. degree. This will enable students to complete the combined degree program in

approximately five years; shortening the time to complete the two degrees by at least one semester.

Admission to the Program

- To be eligible for admission, students must be in their junior year (normally at least 90+ credit hours, including those in progress, and at least one year of undergraduate coursework remaining).
- Students in the B.S. in Computer Science program will be considered for provisional admission to the B.S.-M.C.S program as follows:
 - Students who hold a 3.2 or higher technical GPA and a 3.0 or higher overall GPA will receive automatic admission upon request.
 - Students whose technical GPA is less than 3.2, but at least 3.0, and whose overall GPA is at least 3.0 may apply through an application process administered by the Department's Graduate Academic Office.
- Admissions to this program will occur both in the fall and spring term. The application deadline for spring term will be October 15th and for fall term will be March 15th.
- Applications for this program will be reviewed by a subgroup of the Computer Science Department's admission committee, and students accepted into the program will be given "provisional admission".
- Students granted provisional admission will be moved to full admission status once they have completed all of their undergraduate course requirements, including at least three of the four courses required by the Breadth Requirement of the M.C.S. degree, and completed an application for admission to the Graduate College. Once accepted, students will be issued letters of admission through the Graduate College's Admission Office, and they will be transferred to the separate curriculum code that will be established for the combined degree program. Students who have been formally admitted to the combined degree program will be considered graduate students beginning with the next semester and will be assessed with graduate tuition rates.
- Students admitted to this combined program must maintain an overall 3.0 GPA in order to remain in the program.

Program Implementation

- The Computer Science Department's Graduate Academic Office will be responsible for implementing and overseeing this program.
- Students admitted to the combined program will receive both the B.S. and the M.C.S. degree once all requirements for the combined degree program have been completed.
- Students in this combined program must satisfy the university's minimum undergraduate residence requirements of at least 60 semester hours at the University of Illinois at Urbana-Champaign and the one semester minimum graduate residence requirement.
- Students will be required to complete their bachelor's degree within four years from the time they started (two years for transfer students).

- Students will start to earn graduate level credits once they have officially been admitted into the Graduate College. In some cases, students who are in their final semester of their senior year and have less than 12 credit hours remaining for their B.S. degree requirements may take additional 400 or 500 level courses (beyond the three of four Breadth Requirement courses) that are transferred to their graduate degree.

JUSTIFICATION:

The Department of Computer Science proposes the establishment of a combined B.S. in Computer Science and M.C.S. that may be completed in five years for the following reasons:

- Students enrolled in the College of Engineering Computer Science curriculum who maintain an excellent academic performance, as described above, will be eligible to apply for this program. The existence of a combined program will encourage good students to plan early for graduate school and stay one more year to complete their master's.
- The combined program will provide a smooth integration of bachelor's and master's studies and will continue to provide the same breadth and depth of coverage for all the required courses of the existing B.S. and M.C.S. program.
- The combined program will enable the department to identify its excellent students early in their academic careers and will constitute a mechanism for early introduction to the master's program, with the goal of increasing the number of our students leaving with a master's degree.
- The combined program will send much needed, qualified master's graduates into the workplace six months to a year sooner, on average, than is the case with students who earn separate degrees.
- The combined program will likely attract superior high school graduates to our department, whom we would otherwise lose to peer institutions with similar combined B.S.-M.C.S. degrees.

BUDGETARY AND STAFF IMPLICATIONS:

- Additional staff and dollars needed:* No additional staff or dollars are anticipated. Currently we have approximately 100 students in the program with a target growth of 30 to 40 bachelor's students who will join this program over the next few years. With the current staff, we can manage the anticipated growth.
- Internal reallocation (e.g., change in class size, teaching loads, student-faculty ratio, etc.):* No internal reallocations are anticipated due to reducing the number of credit hours in elective courses.
- Effect on course enrollment in other units and explanation of discussions with representatives of those departments:* Minimal. Since graduate enrollments will go up, each of the many available CS course electives may see minor increases in enrollment. Some of these courses are cross-listed with other departments. We have attached letters from those departments which regularly teach any of these courses.
- Impact on the University Library:* No impact on the University Library is anticipated. (Letter is attached.)

E. *Impact on computer use, laboratory use, equipment, etc.:* None. Graduate student use of computer laboratories in the M.C.S program is minimal. There is no use of research laboratories.

DESIRED EFFECTIVE DATE:

Fall 2013

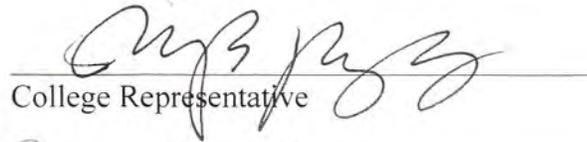
STATEMENT FOR THE PROGRAMS OF STUDY CATALOG:

See Appendix A.

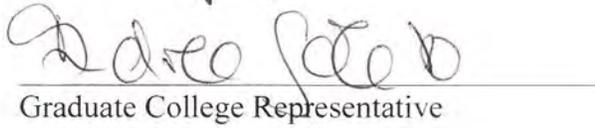
CLEARANCES:


Unit Representative

2/1/13
Date


College Representative

2/1/13
Date


Graduate College Representative

3/25/13
Date

Provost Representative

Date

Educational Policy Committee Representative

Date

Appendix A: Statement for Programs of Study Catalog

Combined B.S.-M.C.S. Engineering Degree Programs

Computer Science

The five-year B.S.-M.C.S. program in Computer Science combines two degrees: a B.S. in Computer Science with an M.C.S. (non-thesis) in Computer Science. Current Illinois Computer Science students enrolled in the College of Engineering who are in their junior year (normally at least 90 credit hours, including those in progress, and at least one year of undergraduate coursework remaining) who maintain superior academic performance are eligible to apply for this program. Students admitted to the program will receive both degrees once all requirements for the 5-year B.S.-M.C.S. degree program have been successfully completed, but will be permitted to participate in the B.S. degree graduation ceremony with their class if they have completed the equivalent 128 credit hours.

Course Requirements

B.S. Component (120 hours plus three 400-level courses for 9-12 graduate hours):

- Same required courses as the traditional B.S. degree with the minimum hours required – not counting technical electives taken for graduate credit (see below) – reduced from 128 to 120.
- Coursework shared by the B.S. and M.C.S. components must include three courses and at most 12 credit hours of 400-level CS courses required for the B.S. which also count towards the Breadth coursework requirement of the M.C.S. component, all which must be taken for graduate credit. (Students must take the graduate section of the courses if offered and are strongly encouraged to take the 4-hour section if available). The CS Graduate academic advisor will assist students in mapping out this coursework.
- Illinois undergraduate student minimum residence requirement satisfied.
- Overall grade point average (GPA) of 3.0 maintained through completion of B.S. component of the program.

M.C.S. Component (minimum 24 additional credit hours):

- Identical to the traditional M.C.S. program but with the majority of the Breadth Requirement satisfied while still classified as undergraduate (though held to the standards of a graduate student). A total of ~~36~~32 hours (including the shared coursework) are required.
- Satisfy Illinois' graduate student minimum residence requirement.
- Overall GPA of 3.00 must be maintained through completion of M.C.S. component of the program.

Admission

For deadlines and procedures, consult the department Web site. Current Illinois Computer Science students who are in their junior year (normally at least 90 credit hours,

including those in progress, and at least one year of undergraduate coursework remaining) with an overall GPA of at least 3.0 and a technical GPA 3.0 may apply for provisional admission to the program. The 5-year program is highly competitive. Students provisionally admitted to the program:

- are assigned a graduate academic advisor when admitted.
- must maintain an overall GPA of 3.0 through completion of the B.S. component of the degree to remain in the program.
- may register for graduate courses and earn graduate hours credit, with approval from their graduate academic advisor, if they have less than 12 credit hours remaining ~~no more than 10 hours left~~ in their B.S. component.
- must earn at least 120 hours of undergraduate credit, 9 hours of graduate credit (in the Breadth Requirement courses), and satisfy all B.S. requirements to be officially admitted to the Graduate College.

Upon successful completion of the B.S. component (including grades of B- or better in the Breadth Requirement coursework), and an overall GPA of at least 3.00 in all graduate coursework, students:

- must apply and be officially admitted into the Graduate College.
- will be issued letters of admission from the Office of Admissions and Records and the Computer Science Department, at which time they will be considered graduate students and assessed graduate tuition the following semester.
- must continue to maintain a graduate GPA of 3.00 or better in order to remain in the combined program.

Withdrawal

Students may withdraw from the program at any time by notifying the Office of the Associate Dean for Undergraduate Programs and the Assistant Director of CS Graduate Programs. Students who do not complete all 5-year B.S.- M.C.S. degree program requirements may, upon request, have all graduate hours earned, including the Breadth Requirement coursework, converted to undergraduate hours and applied toward a traditional B.S. degree in Computer Science. Students reverted back to the B.S. degree program must earn the minimum number of hours and satisfy all degree requirements of whichever version of the B.S. curriculum is appropriate. Graduate credit not used to fulfill the B.S. degree requirements will remain on the transcript and may, at some future point, be considered for transfer to another degree program.

Appendix B. Course Lists for *Breadth Requirement*

Breadth Requirement Courses (Proposed)

Architecture, Compilers, Parallel Computing

- CS 420—Parallel Progrmg: Sci & Engrg
- CS 426—Compiler Construction
- CS 431—Embedded Systems
- CS 433—Computer System Organization
- CS 435—Intro to VLSI Systems Design
- CS 462—Logic Design
- CS 526—Advanced Compiler Construction
- CS 533—Parallel Computer Architecture
- CS 536—Fault-Tolerant Dig Syst Design

Artificial Intelligence

- CS 440—Artificial Intelligence
- CS 443—Introduction to Robotics
- CS 446—Machine Learning
- CS 543—Computer Vision
- CS 546—Machine Learning in NLP
- CS 548—Models of Cognitive Processes
- CS 549—Seminar in Cognitive Science

Databases, Information Systems, Bioinformatics

- CS 410—Text Information Systems
- CS 411—Database Systems
- CS 412—Introduction to Data Mining
- CS 466—Introduction to Bioinformatics
- CS 511—Advanced Database Systems
- CS 512—Data Mining Principles

Formal Methods, Programming Languages, Software Engineering

- CS 421—Progrmg Languages & Compilers
- CS 422—Programming Language Design
- CS 427—Software Engineering I
- CS 428—Software Engineering II
- CS 476—Program Verification
- CS 477—Formal Software Devel Methods
- CS 522—Programming Language Semantics

CS 524—Concurrent Progrmg Languages

CS 527—Topics in Software Engineering

CS 576—Topics in Automated Deduction

CS 598—Special Topics* – *qualifies when taken for at least 3 credit hours and the topic is Object-Oriented Programming and Design (section REJ)*

Graphics/HCI

CS 417—Computer-Assisted Instruction

CS 418—Interactive Computer Graphics

CS 419—Prodcution Computer Graphics

CS 465—User Interface Design

CS 519—Scientific Visualization

CS 565—Human-Computer Interaction

Systems and Networking (includes Real-time systems and security)

CS 414—Multimedia Systems

CS 423—Operating Systems Design

CS 424—Real-Time Systems

CS 425—Distributed Systems

CS 438—Communication Networks

CS 439—Wireless Networks

CS 461—Computer Security I

CS 463—Computer Security II

CS 523—Advanced Operating Systems

CS 525—Advanced Distributed Systems

CS 541—Computer Systems Analysis

CS 563—Advanced Computer Security

Scientific Computing

CS 450—Numerical Analysis

CS 457—Numerical Methods II

CS 482—Simulation

CS 554—Parallel Numerical Algorithms

CS 555—Numerical Methods for PDEs

CS 556—Iterative & Multigrid Methods

CS 558—Topics in Numerical Analysis

* It is expected that special topics sections will abide by the limitation on the number of repetitions set by Senate Rule and if after initial pilot offerings permanency is desired, proposals to convert them to permanent courses will be submitted through the usual channels. Upon approval, the courses will be considered for addition to the list.

Theoretical Computer Science

CS 475—Formal Models of Computation

CS 573—Algorithms

CS 579—Computational Complexity

UNIVERSITY OF ILLINOIS
AT URBANA-CHAMPAIGN

University Library
Office of Dean of Libraries
and University Librarian
230 Main Library, MC-522
1408 West Gregory Drive
Urbana, IL 61801



March 5, 2013

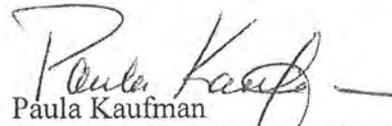
Victoria L. Coverstone
Associate Dean, Office of Graduate and Professional Programs
College of Engineering
401 Engineering Hall
MC-266

Dear Dean Coverstone:

Thank you for providing the University Library with the opportunity to review the College of Engineering's proposal to the Senate Committee on Educational Policy to establish a new combined degree, awarding the B.S./M.C.S. Based upon the proposal that we reviewed, we do not believe that there will be any substantive impact on existing library offerings—either in terms of library materials or personnel.

The librarians in the Grainger Engineering Library have an excellent relationship with the College and if additional services or materials are required as the program develops, I have every confidence that we will be able to work together to meet the needs of the students.

Sincerely,



Paula Kaufman
Dean of Libraries and University Librarian

c: Thomas Teper
William Mischo
Mary Schlembach
Elizabeth Stovall, Graduate Programs Director, CoE ✓

Dennis, Robin A

From: Stovall, Elizabeth H
Sent: Tuesday, February 12, 2013 2:14 PM
To: Dennis, Robin A
Subject: ECE email for BS-MCS

----- Original Message -----

Subject: Approval on coursework listed in a new joint BS-MCS curriculum proposal
Date: Thu, 10 Jan 2013 10:51:21 -0600
From: Andreas C Cangellaris, ECE Head <ece-head@illinois.edu>
To: Rutenbar, Rob <rutenbar@illinois.edu>
CC: McElroy, Rhonda Kay <rmcelroy@illinois.edu>

Dear Rob,

Thank you for bringing this potential increase in enrollment to our attention. ECE does not see the increase in enrollment as a significant issue. However, given the somewhat lower admission standards for entry into the new BS-MCS degree program relative to existing CS graduate programs, we do foresee the potential for lower average performance among these students than among the existing population of the classes. We do not anticipate that faculty in ECE (nor in general) will change their course grading scales in order to accommodate this shift, so we have some concern that these students may have some difficulty in obtaining the grades that they require to stay in the program.

Sincerely,

Andreas

Andreas C. Cangellaris

M. E. Van Valkenburg Professor and Head

Department of Electrical and Computer Engineering

University of Illinois, Urbana-Champaign

155 Everitt Lab, MC-702

1406 W. Green St.

Urbana, IL 61801

Tel: 217.333.2301

Office of the Provost and Vice Chancellor
for Academic Affairs

Swanlund Administration Building
601 East John Street
Champaign, IL 61820



April 1, 2013

Gay Miller, Chair
Senate Committee on Educational Policy
Office of the Senate
228 English Building
MC-461

Dear Professor Miller:

Enclosed is a copy of a proposal from the College of Engineering to establish a combined Bachelor of Science in Computer Science and Master of Computer Science.

This proposal has been approved by the College of Engineering Executive Committee as well as the Graduate College Executive Committee. It now requires Senate review.

Sincerely,

A handwritten signature in black ink that reads 'Kristi A. Kuntz'.

Kristi A. Kuntz
Assistant Provost

KAK/nh

Enclosures

Cc: V. Coverstone
A. Golato
M. Lowry
R. Rutenbar
E. Stovall

UNIVERSITY OF ILLINOIS
AT URBANA-CHAMPAIGN

Graduate College

204 Coble Hall
801 South Wright Street
Champaign, IL 61820-6210



Executive Committee

March 21, 2013

2012-2013 Members

Debasish Dutta, *Chair*

Kristi Kuntz
Office of the Provost
207 Swanlund MC-304

Members

Barry Ackerson

Dear Kristi,

David Ceperley

Enclosed please find a proposal to “Establish a Combined Bachelor of Science and Master of Computer Science in the Department of Computer Science.” It is important to note that this proposal is dependent upon approval of a proposal that is currently pending (EP.13.18 entitled “Revision to the Master of Computer Science (M.C.S.) Degree, Department of Computer Science). The pending proposal is requesting a decrease in the total hours for the Master of Computer Science (M.C.S.) degree from 36 hours to 32 hours and this joint program proposal was written as if that proposal was fully approved.

Lin-Feng Chen

Kent Choquette

Jennifer Cole

Brooke Elliott

Susan Garnsey

David Hays

Christine Jenkins

The Graduate College Executive Committee has approved this proposal. I send it to you now for further review.

Ashleigh Jones

Tina Mattila

Sincerely,

Ramona Oswald

Yoon Pak

Joseph Rosenblatt

Alex Winter-Nelson

Andrea Golato
Associate Dean, Graduate College

Assata Zerai

c: V. Coverstone
M. Lowry
R. Rutenbar
E. Stovall

UNIVERSITY OF ILLINOIS
AT URBANA-CHAMPAIGN

College of Engineering
306 Engineering Hall, MC-266
1308 West Green Street
Urbana, IL 61801



RECEIVED
FEB 13 2013
GRADUATE COLLEGE

January 30, 2013

Andrea Golato
Associate Dean
Graduate College
204 Coble Hall
MC-322

Via: Michael B. Bragg, Engineering College 

Dear Dean Golato:

The College of Engineering Executive Committee has reviewed and approved the following proposals:

Establish a Combined Bachelor of Science and Master of Computer Science in the Department of Computer Science, College of Engineering

Revision to the Combined Bachelor of Science in Computer Science and Master of Science in the Department of Computer Science, College of Engineering

Attached is a copy of the requests.

Sincerely yours,



John Hart, Secretary
Executive Committee

Approval Recommended:


Michael B. Bragg, Interim Dean
College of Engineering

2/1/13
Date

JBF/rd

Enclosure

c: Victoria Coverstone
Jonathan Freund
Elizabeth Stovall
Robin Dennis

Name of existing Illinois (UIUC) degree: _____

Name of non-Illinois partnering institution: _____

Location of non-Illinois partnering institution:

State of Illinois US State: _____ Foreign country: _____

- B. Proposal to create a new academic unit (college, school, department, program or other academic unit):

Name of proposed new unit: _____

- C. Proposal to rename an existing academic unit (college, school, department, or other academic unit):

Current name of unit: _____

Proposed new name of unit: _____

- D. Proposal to reorganize existing units (colleges, schools, departments, or program):

1. Proposal to change the status of an existing and approved unit (e.g. change from a program to department)

Name of current unit including status: _____

2. Proposal to transfer an existing unit:

Current unit's name and home: _____

Proposed new home for the unit: _____

3. Proposal to merge two or more existing units (e.g., merge department A with department B):

Name and college of unit one to be merged: _____

Name and college of unit two to be merged: _____

Proposed name and college of new (merged) unit: _____

4. Proposal to terminate an existing unit:

Current unit's name and status: _____

- E. **Other educational policy proposals** (e.g., academic calendar, grading policies, etc.)

Nature of the proposal: _____

Revised 10/2012