October 29, 2008

MEMORANDUM

TO:	Dr. Douglas Estry, Associate Provost for Undergraduate Education and Dean of Undergraduate Studies
FROM:	Dr. Linda O. Stanford, Associate Provost for Academic Services
RE:	Request to Establish a Minor in Computer Science with an Admission Requirement

<u>For Transmittal to the University Committee on Academic Policy (UCAP)</u>

The request referenced above is being sent to you for action by the University Committee on Academic Policy (UCAP).

<u>UCAP Response Requested:</u>

Please ask the UCAP to consider the request referenced above at its meeting on November 6, 2008. Please mail the related materials referenced under the heading <u>Attachments</u> at the end of this memorandum to the members of the UCAP.

The academic program and course requests referenced above will be included on the agenda for the November 6, 2008 meeting of Subcommittee A, University Committee on Curriculum (UCC). Requests that are approved by Subcommittee A on November 6 will be before the Full Committee, UCC, for action on November 20, 2008. Requests that are approved by the Full Committee on November 20 will be included in the January 27, 2009, Report of the UCC to the Academic Council.

If you have any questions about this memorandum or the attached materials, please call me at 5-8420.

Thank you for your help.

<u>Attachments:</u>

1. Request for a New Academic Program form for a Minor in Computer Science and attachments.

**UNIVERSITY
CURRICULUM
and CATALOG**

Michigan State University
176 Administration Building
East Lansing, Michigan
48824-1046

PH: 517/355-8420
FAX: 517/353-1935

s:\share\ucapcseminor

COLLEGE OF ENGINEERING

1. Request to establish a **Minor in Computer Science** in the Department of Computer Science and Engineering. The University Committee on Academic Policy (UCAP) will consider this request at its November 6, 2008 meeting.

    a. **Background Information:**

    The Computer Science major program is available at over 2000 U.S. colleges including at Michigan State University since 1968. Computing is pervasive across all professions from accounting to zoology. Offering a minor will provide students with a formal development of computing background and knowledge of fundamental concepts and programming skills, which can be applied to many disciplines.

    b. **Academic Programs Catalog Text:**

    The Minor in Computer Science and Engineering is administered by the Department of Computer Science and Engineering. This minor will provide students with a basic foundation in computer science that is applicable to many disciplines. This will also provide opportunities for students in industry or government, as well as prepare students for graduate-level study in computer science.

    The minor is available as an elective to students who are enrolled in bachelor's degree programs at Michigan State University other than the Bachelor of Science Degree in Computer Science or the Bachelor of Science Degree in Computer Engineering . With the approval of the department and college that administers the student's degree program, the courses that are used to satisfy the minor may also be used to satisfy the requirements for the bachelor's degree.

    Students who plan to complete the requirements for the minor must apply to the Department of Computer Science and Engineering. The minimum criteria for acceptance is the completion of Computer Science and Engineering 231 and 260 with a combined grade-point average in those two courses of 3.00. Enrollment may be limited. Application forms are available at www.cse.msu.edu.

    Requirements for the Minor in Computer Science

    Complete 18 credits in the Department of Computer Science and Engineering from the following:

				CREDITS
1.	All of the following courses (12 credits):			
	CSE	231	Introduction to Programming I	4
	CSE	232	Introduction to Programming II	4
	CSE	260	Discrete Structures	4
2.	One of the following courses (3 credits):			
	CSE	320	Computer Organization and Architecture	3
	CSE	331	Algorithms and Data Structures	3
	CSE	335	Object-Oriented Software Design	3
3.	One of the following courses (3 credits):			
	CSE	410	Operating Systems	3
	CSE	420	Computer Architecture	3
	CSE	422	Computer Networks	3
	CSE	425	Introduction to Computer Security	3
	CSE	435	Software Engineering	3
	CSE	440	Introduction to Artificial Intelligence	3
	CSE	450	Translation of Programming Languages	3
	CSE	452	Organization of Programming Languages	3
	CSE	460	Computability and Format Language Theory	3
	CSE	471	Media Processing and Multimedia Computing	3
	CSE	472	Computer Graphics	3
	CSE	475	Introduction to Computational Linguistics	3

| CSE | 480 | Database Systems | 3 |
| CSE | 484 | Information Retrieval | 3 |

Effective Summer 2009.

View a Program

Program Name: Computer Science and Engineering   Degree Name: AM   Sequence Number: 1

Effective Dates: Fall 2008 - Open   Status: Interim   Initial Action: New

Requested Date: 3/6/2008 11:24:20 AM

1. Department/School/College:
    16172 .... Department of Computer Science and Engineering

2. Name of Program:
    Computer Science and Engineering

3. Name of Degree:
    AM

4. Type of Program:
    Major Computer Science and Engineering Minor
Major Computer Science and Engineering Minor

5. Effective Start Semester:
    Fall 2008

6. Target student audience for the program:
    all undergraduate majors at MSU

7. Enrollment:
    What is the expected enrollment per year:
    25
    What is the minimum enrollment acceptable:
    10

8. Source of budget for the program:
    Internal

9. Projected Costs as compared to other programs in unit:
    Lower

10. Staff requirement:
    How many additional staff will be required:
    0
    Who will provide the primary instruction. Describe any external linkages(industry, government, etc.):
    CSE can support up to 25 new students per year without additional resources at the current time; the capacity exists due to the reduction in demand for the CSE major from 2001.

11. Will additional equipment be required:
    Approximate cost:
    0
    Source of funding:

12. Will additional library materials be required:
    Approximate cost:
    0
    Source of funding:
    materials already exist for major program

13. Will additional space be required:
    Type:

    Approximate amount:

14. If the program requirements contain a named concentration, do you wish for the concentration to be noted on the student's transcript?:
    No

15. Detailed Description:

Minor in Computer Science (Proposed for Fall 2008)

The academic minor in Computer Science will provide a basic foundation in Computer Science. Those completing the minor will be able to apply computing skills in their respective discipline.
The minor in Computer Science is available as an elective for those students enrolled in a bachelor's degree program at MSU other than Computer Science or Computer Engineering. Students wantir
apply to the Department of Computer Science at the time of completion of two of the three required 200-level courses listed below and must satisfy the current minimum GPA. Enrollment may be li
available on the Dept. web site at www.cse.msu.edu.)

Requirements for the Minor in Computer Science

Complete 18 credits in Computer Science and Engineering as follows:

    CSE 231 (4 credits) Introduction to Programming I

    CSE 232 (4 credits) Introduction to Programming II

    CSE 260 (4 credits) Discrete Structures

    One 300 level course from CS major requirements
    One 400 level course from CS major requirements

    Note that Calculus I and Calculus II are implied components of the proposed minor, since those courses are prerequisites for require

After completion of the minor

With this background, you will be able to apply computing in your discipline, pursue employment opportunities in industry or government, or perhaps enter a graduate program in Computer Science computing.
  15. Detailed description:

a. Background information including the considerations which precipitated the development of the program, and its relationship to similar programs offered at MSU and by other educational institutions. Supply a copy of standards of accrediting agencies and federal regulations related to the request as appropriate.

The Computer Science major program is available at over 2000 US colleges, including at MSU since 1968. Here we are proposing a MINOR. Documentation for the major and the accrediting and governing organizations are accessible as below.

Association for Computing Machinery   Home: http://www.acm.org/
Relevant doc Dec 2001:   http://www.acm.org/education/curric_vols/cc2001.pdf

ABET/CSAB/CAC   Home :   www.abet.org

Training slides for Current CAC Program Evaluator Training:
http://cit.georgiasouthern.edu/seminars/seminars/BITS_2_8_06.ppt

b. Rationale for offering the program at MSU.

Computing is pervasive across all professions – from accounting to zoology – so it makes sense to offer a minor to majors interested in formal development of computing background. CSE had so many majors in the recent past that it could not accommodate other majors. (For example, Physics made a direct request 10 years ago for a set of courses similar to a minor.) Due to the drop in majors from 10 years ago, CSE has the capacity to accommodate about 25 new minors per year given its current resources.

c. Rationale for the program being housed in the primary administrative unit.

CSE supports the Computer Science major.

d. Educational objectives of the program and their relationship to those of the college and the University.

The CSE Minor program will enable non CSE majors to develop fundamental concepts and programming skills so that they can apply computing in their own disciplines.

e. Faculty who were instrumental in developing the program and faculty who will be responsible for implementing the program (see item 10).

All CSE faculty will be involved.

f. Plan for evaluating the program. Plan for assessing student outcomes. For academic major programs, indicate the learning objectives/goals for students and how outcomes will be assessed . Visit
http://www.reg.msu.edu/Read/UCC/assessfrm.doc to complete
the outcomes assessment form and include with the program submission.

MSU ASSESSMENT FORM ATTACHED

g. Program description including statement and specific requirements of the program as they will appear in the University catalog. Information contained in the catalog represents a University contract with students. Any deviation from college and University policies must be specifically requested. For a master's degree program, indicate whether Plan A (thesis) or B (non-thesis) or both will be available.

DONE PREVIOUSLY
h. If the program will be offered in a location other than the main campus in East Lansing, specify the location (s).

NA

i. List the name and describe any certificate program that is associated with a new or extant degree program.

NA

– Explain the relationship between the certificate program and a new or extant degree program.

– If a certificate program is being proposed that is to related to a degree program, please explain how the department/school/college will learn that the supervising faculty have endorsed the potential certificate holders as possessing specified skills or competency levels that render them eligible to receive the certificate and the degree.

j. Other information that will assist the Provost and the University-level committees in evaluating the request.

Michigan State University

Assessing Student Outcomes

College: Engineering

Department: Computer Science and Engineering

Program or Major: CSE Minor

Program Level: Undergraduate

Contact Person: George Stockman, CSE

Inventory of Written Statements and Plans

1. Do you have a written mission statement or statement of purpose??? yes   no
   If yes, please attach a copy or reference where this can be found:

   Minor in Computer Science (Proposed for Fall 2008)

The academic minor in Computer Science will provide a basic foundation in Computer Science. Those completing the minor will be able to apply computing skills in their respective discipline. The minor in Computer Science is available as an elective for those students enrolled in a bachelor's degree program at MSU other than Computer Science or Computer Engineering. Students wanting to complete the minor must apply to the Department of Computer Science at the time of completion of two of the three required 200-level courses listed below and must satisfy the current minimum GPA. Enrollment may be limited. (Application forms are available on the Dept. web site at www.cse.msu.edu.)

Requirements for the Minor in Computer Science

Complete 18 credits in Computer Science and Engineering as follows:

CSE 231 (4 credits) Introduction to Programming I
CSE 232 (4 credits) Introduction to Programming II
CSE 260 (4 credits) Discrete Structures
One 300 level course from CS major requirements
One 400 level course from CS major requirements

Note that Calculus I and Calculus II are implied components of the proposed minor, since those courses are prerequisites for required courses of the Minor.

After completion of the minor

With this background, you will be able to apply computing in your discipline, pursue employment opportunities in industry or government, or perhaps enter a graduate program in Computer Science or other area emphasizing computing.

2. Do you have a written statement of intended educational outcomes   X yes   no
describing what a student should know or be able to do when they
   have completed this program?

3. Do you have a written method of assessment for measuring student   X yes   no
   outcomes?

   A working draft exists. The CSE major will first be evaluated for accreditation in Fall 2010.

4. Does your program have a separate accreditation process?   X yes   no
   If yes, please list all accrediting agencies below:

   ABET/CSAB/CAC   Home :   www.abet.org

Training slides for Current CAC Program Evaluator Training:
http://cit.georgiasouthern.edu/seminars/seminars/BITS_2_8_06.ppt   The CSE Major will be
evaluated for the first time in Fall 2010.

Assessment Methodologies

It is likely that some assessment measures are already in place in this program even if they are not identified as being part of a formal assessment plan. Listed below are some of the assessment methodologies you may be using. Indicate "A" if the method is currently being used; "B" if it is not being used but you are interested in using it; and "C" if the method of assessment does not apply to your program.

Direct Methods of Assessment

1.   A   Comprehensive Examinations (for individual courses)
2.   Writing proficiency Examinations
3.   National Examinations assessing subject matter knowledge
4.   Graduate Record Exam General Test
5.   Graduate Record Exam Subject Test

6.   C   Certification Examinations
7.   C   Licensure Examinations
8.   Locally developed pre-test or post-test for subject matter knowledge
9.   A   Senior thesis or major project (CSE students do projects in all years)
10.   Portfolio evaluation of student work
11.   A   Capstone course
12.   Audio or Video tape evaluations

Indirect Methods of Assessment

1.   A   Comparison or benchmarking with peer institutions
2.   A   Job placement of graduates
3.   A   Employer surveys
4.   A   Advisory groups from your profession
5.   Graduate school acceptance rates
6.   Student graduation/retention rates
7.   A   Exit interviews with students graduating or leaving the program
8.   A   Student satisfaction surveys
9.   A   Student course evaluations
10.   Focus group discussions
11   A   Alumni surveys
12.   Alumni honors, awards, achievements
13.   Analysis of grade distributions
14.   Peer review of courses
15.   Peer review of program
16.   A   Curriculum/syllabus analysis
17.   B   Community service/volunteerism participation
18.   Other:

Does your program have an experiential learning component?   X yes   no
If yes, how do you assess the student learning outcomes from that experience?

1.   A   Participate in a class designed to complement the experience
2.   A   Student journals
3.   A   Formal evaluation procedures from field-based supervisor (industrial client)
4.   Formal meetings between supervisor, student, and faculty
5.   Formal test of practical skills
6.   Other:

Implementation Plans

1.   How has your department used any of the indicators above to improve services and
programs for students?
We have changed our laboratory exercises and our first course programming language; we have
added two 100-level courses (EGR 100 and CSE 100) for professionalism, problem-solving, and
teamwork. We have deleted MTH 235 as a requirement for the program. We have included more
professional ethics in our courses.

2.   When you think about developing and implementing an assessment plan, what concerns do
you have?

(a)   Can it be practically implemented? (b) Does an assessment technique really assess the
outcome intended?

Return this form to: Kelly Funk
                221 Administration Building

Assessing Student Outcomes modified and used with permission, Dr. Sharron L. Ronco, Florida Atlantic University

DEPARTMENT LEVEL APPROVAL STATUS

Approved by: Department of Computer Science and Engineering
3/28/2008 2:41:35 PM by George Stockman for Matt W. Mutka, Acting Chairperson

Comments: Proposal for a Minor in CSE has been approved by CSE: George Stockman

COLLEGE LEVEL APPROVAL STATUS

Approved by: College of Engineering
4/2/2008 11:03:10 AM by Jamie Ramos for Thomas F. Wolff, Associate Dean

DRAFT

DEPARTMENT of COMPUTER SCIENCE and ENGINEERING

Matt W. Mutka, Acting Chairperson

UNDERGRADUATE PROGRAM

Computer science encompasses the broad areas of information processing and problem solving using digital computers. Students learn to analyze, design, and build integrated software and hardware digital systems that process, transmit, and reason about information in order to solve problems. Computer science graduates are employed in essentially all areas of industry, government, and education. They serve as system analysts involved with problems in business and research, designers and planners of process and production control software systems, computer component and system designers, programmers, and teachers.

The Bachelor of Science program provides both a theoretical foundation in computer science, required for continued success in this rapidly changing field, as well as practical experience with current tools and techniques. To achieve these goals, students take courses that span a spectrum of knowledge ranging from theoretical foundations, which enable rigorous analysis of computational problems and solutions, to applied design and engineering methods. At the upper level, students choose from a wide range of elective courses focusing on computer networks, computer architecture, artificial intelligence, database systems, computer security, software engineering, and computer graphics. The senior year culminates with a team-oriented design course building on much of what one has learned throughout the undergraduate experience. Complementing these major areas, the cognate provides an excellent opportunity to develop an individually selected area of interest.

Students majoring in computer science with interests in other areas have the opportunity to consult and work with interested faculty from a wide range of academic disciplines.

Students who are enrolled in the Bachelor of Science degree program with a major in computer science may elect a Specialization in Game Design and Development. For additional information, refer to the *Specialization in Game Design and Development* statement in the *Department of Telecommunication, Information Studies and Media* section of this catalog.

Requirements for the Bachelor of Science Degree in Computer Science

1. The University requirements for bachelor's degrees as described in the *Undergraduate Education* section of this catalog; 120 credits, including general elective credits, are required for the Bachelor of Science degree in Computer Science.
    The University's Tier II writing requirement for the Computer Science major is met by completing Computer Science and Engineering 498, referenced in item 3. b. below.
    Students who are enrolled in the College of Engineering may complete the alternative track to Integrative Studies in Biological and Physical Sciences that is described in item 1. under the heading **Graduation Requirements for All Majors** in the College statement.
2. The requirements of the College of Engineering for the Bachelor of Science degree.
    The credits earned in certain courses referenced in requirement 3. below may be counted toward College requirements as appropriate.
3. The following requirements for the major:

		CREDITS
a.	Bioscience - Courses may not be used to satisfy both (1) and (2) below	4 to 6

    (1)   One of the following courses:

BS	110	Organisms and Populations	4
BS	111	Cells and Molecules	3
ENT	205	Pests, Society and Environment	3
MMG	201	Fundamentals of Microbiology	3
PLB	105	Plant Biology	3

DRAFT

	PSL	250	Introductory Physiology	4
	ZOL	141	Introductory Human Genetics	3

Biological Science 110 satisfies both requirement 3.a.(1) and 3.a.(2).

  (2) One of the following courses:

	BS	110	Organisms and Populations	4
	BS	111L	Cell and Molecular Biology Laboratory	2
	CEM	161	Chemistry Laboratory I	1
	CEM	162	Chemistry Laboratory II	1
	PHY	191	Physics Laboratory for Scientists, I	1
	PHY	192	Physics Laboratory for Scientists, II	1
	PLB	106	Plant Biology Laboratory	1

b. All of the following courses: 28

	CSE	100	Computer Science Profession	1
	CSE	232	Introduction to Programming II	4
	CSE	260	Discrete Structures in Computer Science	4
	CSE	320	Computer Organization and Architecture	3
	CSE	331	Algorithms and Data Structures	3
	CSE	335	Object-Oriented Software Design	3
	CSE	410	Operating Systems	3
	CSE	498	Collaborative Design (W)	4
	STT	351	Probability and Statistics for Engineering	3

c. An additional five courses selected from the following: 15

	CSE	420	Computer Architecture	3
	CSE	422	Computer Networks	3
	CSE	425	Introduction to Computer Security	3
	CSE	435	Software Engineering	3
	CSE	440	Introduction to Artificial Intelligence	3
	CSE	450	Translation of Programming Languages	3
	CSE	452	Organization of Programming Languages	3
	CSE	460	Computability and Formal Language Theory	3
	CSE	471	Media Processing and Multimedia Computing	3
	CSE	472	Computer Graphics	3
	CSE	475	Introduction to Computational Linguistics	3
	CSE	480	Database Systems	3
	CSE	484	Information Retrieval	3

Students may substitute two of the five courses with mathematics or statistics courses. All substitutions must be preapproved by the student's academic adviser.

d. Required Cognate: 15

Cognates in the following areas are available to students in Computer Science: business, communication arts and sciences, foreign language, mathematics, the natural sciences, philosophy, psychology, the social sciences, and telecommunication. Students may complete cognates in other areas with the approval of the Department of Computer Science and Engineering academic adviser. The cognate should enhance the student's ability to apply analytical procedures in a specific subject area.

The cognate requires a minimum of four courses totaling 15 or more credits outside the College of Engineering selected from (1) or (2) below. The academic adviser of the Department of Computer Science and Engineering must pre approve both the cognate and the cognate courses.

  (1) At least 6 of the 15 credits must be in courses at the 300-400 level. The cognate in The Eli Broad College of Business requires a specific set of courses: ACC 230, EC 210, FI 320, GBL 323, and MSC 327.

  (2) A sequence of at least four courses in a foreign language.

TEACHER CERTIFICATION OPTION

A computer science disciplinary minor is available for teacher certification.

Students who elect the computer science disciplinary minor must contact the Department of Computer Science and Engineering.

For additional information, refer to the statement on *TEACHER CERTIFICATION* in the *Department of Teacher Education* section of this catalog.

MINOR IN COMPUTER SCIENCE

The Minor in Computer Science and Engineering is administered by the Department of Computer Science and Engineering. This minor will provide students with a basic foundation in computer science that is applicable to many disciplines. This will also provide opportunities for students in industry or government, as well as prepare students for graduate-level study in computer science.

The minor is available as an elective to students who are enrolled in bachelor's degree programs at Michigan State University other than the Bachelor of Science Degree in Computer Science or the Bachelor of Science Degree in Computer Engineering . With the approval of the department and college that administers the student's degree program, the courses that are used to satisfy the minor may also be used to satisfy the requirements for the bachelor's degree.

Students who plan to complete the requirements for the minor must apply to the Department of Computer Science and Engineering. The minimum criteria for acceptance is the completion of Computer Science and Engineering 231 and 260 with a combined grade-point average in those two courses of 3.00. Enrollment may be limited. Application forms are available at www.cse.msu.edu.

Requirements for the Minor in Computer Science

Complete 18 credits in the Department of Computer Science and Engineering from the following:

				CREDITS
1.	All of the following courses (12 credits):			
	CSE	231	Introduction to Programming I	4
	CSE	232	Introduction to Programming II	4
	CSE	260	Discrete Structures	4
2.	One of the following courses (3 credits):			
	CSE	320	Computer Organization and Architecture	3
	CSE	331	Algorithms and Data Structures	3
	CSE	335	Object-Oriented Software Design	3
3.	One of the following courses (3 credits):			
	CSE	410	Operating Systems	3
	CSE	420	Computer Architecture	3
	CSE	422	Computer Networks	3
	CSE	425	Introduction to Computer Security	3
	CSE	435	Software Engineering	3
	CSE	440	Introduction to Artificial Intelligence	3
	CSE	450	Translation of Programming Languages	3
	CSE	452	Organization of Programming Languages	3
	CSE	460	Computability and Format Language Theory	3
	CSE	471	Media Processing and Multimedia Computing	3
	CSE	472	Computer Graphics	3
	CSE	475	Introduction to Computational Linguistics	3
	CSE	480	Database Systems	3
	CSE	484	Information Retrieval	3