CEAS-14-CS-063R

REQUEST TO COLLEGE CURRICULUM COMMITTEE FOR CURRICULAR IMPROVEMENTS

DEPARTMENT: **PROPOSED EFFECTIVE SEMESTER:** **COLLEGE:**

PROPOSED IMPROVEMENTS

Academic Program
- ☐ New degree*
- ☐ New major*
- ☐ New curriculum*
- ☐ New concentration*
- ☐ New certificate
- ☐ New minor
- XX **Revised major**
- ☐ Revised minor
- ☐ Admission requirements
- ☐ Graduation requirements
- ☐ Deletion ☐ Transfer
- ☐ Other (explain**)

Substantive Course Changes
- ☐ New course
- ☐ Pre or Co-requisites
- ☐ Deletion (required by others)
- ☐ Course #, different level
- ☐ Credit hours
- ☐ Enrollment restriction
- ☐ Course-level restriction
- ☐ Prefix ☐ Title and description (attach current & proposed)
- ☐ General education (select one) Not Applicable
- ☐ Other (explain**)

Misc. Course Changes
- ☐ Title
- ☐ Description (attach current & proposed)
- ☐ Deletion (not required by others)
- ☐ Course #, same level
- ☐ Variable credit
- ☐ Credit/no credit
- ☐ Cross-listing
- ☐ COGE reapproval
- ☐ Other (explain**)

** **Other:**

Title of degree, curriculum, major, minor, concentration, or certificate: **Computer Science (CSI)**

Existing course prefix and #: **Proposed course prefix and #:** **Credit hours:**

Existing course title:

Proposed course title:

Existing course prerequisite & co-requisite(s):

Proposed course prerequisite(s)
If there are multiple prerequisites, connect with "and" or "or". To remove prerequisites, enter "none."

Proposed course co-requisite(s)
If there are multiple corequisites, they are always joined by "and."

Proposed course prerequisite(s) that can also be taken concurrently:

Is there a minimum grade for the prerequisites or corequisites? **C for undergraduates**
The default grades are D for undergraduates and C for graduates.

Major/minor or classification restrictions:
List the Banner 4 character codes and whether they should be included or excluded.

For 5000 level prerequisites & corequisites: Do these apply to: (circle one) undergraduates graduates both

Specifications for University Schedule of Classes:

a. Course title (maximum of 30 spaces):

b. Multi-topic course: ☐No ☐Yes

c. Repeatable for credit: ☐ No ☐ Yes

d. Mandatory credit/no credit: ☐ No ☐Yes

e. Type of class and contact hours per week (check type and indicate hours as appropriate)

1. ☐ Lecture
2. ☐ Lab or discussion
3. ☐ Lecture/lab/discussion
4. ☐ Seminar or ☐ studio
5. ☐ Independent study
6. ☐ Supervision or practicum

CIP Code (Registrar's use only):

Chair/Director — Date 3/23/15

Chair, College Curriculum Committee — Date 3/25/15

Dean — Date: — Graduate Dean: — Date 3-26-15

Curriculum Manager: Return to dean ☐ Date — Forward to: — Date

Chair, COGE/ PEB / FS President — Date

FOR PROPOSALS REQUIRING GSC/USC REVIEW:

* ☐ Approve ☐ Disapprove | Chair, GSC/USC — Date

* ☐ Approve ☐ Disapprove | Provost — Date

Revised May 2007. All previous forms are obsolete and should not be used.

1. Explain briefly and clearly the proposed improvement.

   The new Computer Science major introduced last year allows students to choose one Math/Stat elective to complete their 15 credit hours of Math, required by ABET (in addition to a further 15 credit hours of Math/Stat/Science requirements) – beyond MATH1220, STAT2600, CS1310. The proposed change is to require MATH2300 (Linear Algebra) to replace the Math/Stat elective.

2. Rationale. Give your reason(s) for the proposed improvement. (If your proposal includes prerequisites, justify those, too.)

   The previous Computer Science majors (CSG and CST) required students to take MATH2300 (as part of their required Math minor). The new CS major (CSI) gave students greater flexibility in choosing whether to take more math, more statistics or more physical sciences (e.g., to facilitate doing a minor in one of those areas). However, a significant number of CS faculty now feel that Linear Algebra would be helpful to students taking certain CS courses.

3. Effect on other colleges, departments or programs. If consultation with others is required, attach evidence of consultation and support. If objections have been raised, document the resolution. Demonstrate that the program you propose is not a duplication of an existing one.

   CS majors will now all be required to take MATH2300, rather than it just being an elective chosen by some CS majors. So additional seats will be needed in MATH2300. And there will be fewer CS students taking other Math and Statistics courses because of removing the Math/Stat elective. *See attached email from the Math Department.*

4. Effect on your department's programs. Show how the proposed change fits with other departmental offerings.

   This does not change the number of credit hours in the major – it just changes an elective course to a required course. MATH2300 has been offered with sufficient frequency that it should not be difficult for students to be able to register for the course in a timely fashion. The Department will be evaluating which CS courses that Linear Algebra should be a prerequisite for, and submitting curriculum changes for those courses at a future date.

5. Effects on enrolled students: Are program conflicts avoided? Will your proposal make it easier or harder for students to meet graduation requirements? Can students complete the program in a reasonable time? Show that you have considered scheduling needs and demands on students' time. If a required course will be offered during summer only, provide a rationale.

   Although some students have difficulty with this course, when it was required in the previous CS majors, all students did ultimately pass the course – with about 1/3 either taking the course more than once, and/or ultimately completing it with a D or DC. We expect the same situation for the current students in the new major.

6. Student or external market demand. What is your anticipated student audience? What evidence of student or market demand or need exists? What is the estimated enrollment? What other factors make your proposal beneficial to students?

   No effect on market demand – CS graduates are in very high demand. The topics in Linear Algebra would be helpful to students in certain advanced CS courses.

7. Effects on resources. Explain how your proposal would affect department and University resources, including faculty, equipment, space, technology, and library holdings. Tell how you will staff additions to the program. If more advising will be needed, how will you provide for it? How often will course(s) be offered? What will be the initial one-time costs and the ongoing base-funding costs for the proposed program? (Attach additional pages, as necessary.)

   Increase in the number of students taking MATH2300, with a concomitant decrease in the numbers taking MATH1230 (or other math courses) or a Statistics course. *See attached email from the Math Department.*

8. General education criteria. For a general education course, indicate how this course will meet the criteria for the area or proficiency. (See the General Education Policy for descriptions of each area and proficiency and the criteria. Attach additional pages as necessary. Attach a syllabus if (a) proposing a new course, (b) requesting certification for baccalaureate-level writing, or (c) requesting reapproval of an existing course.)

   Not applicable

9. List the learning outcomes for the proposed course or the revised or proposed major, minor, or concentration. These are the outcomes that the department will use for future assessments of the course or program.

   No change

10. Describe how this curriculum change is a response to assessment outcomes that are part of a departmental or college assessment plan or informal assessment activities.

    This is not in response to specific assessment procedures. However, the CS Department continually evaluates our new CS major as to improvements which should help support student success in future CS courses and in their careers after graduation, including the sequencing of the required courses, suggested electives, and re-introducing previously required courses, as is the case here.

11. (Undergraduate proposals only) Describe, in detail, how this curriculum change affects transfer articulation for Michigan community colleges. For course changes, include detail on necessary changes to transfer articulation from Michigan community college courses. For new majors or minors, describe transfer guidelines to be developed with Michigan community colleges. For revisions to majors or minors, describe necessary revisions to Michigan community college guidelines. Department chairs should seek assistance from college advising directors or from the admissions office in completing this section.

    Should not affect transfer students.

WMU Webmail Plus **kaminski@wmich.edu**

Fwd: MA2300

From : Steven Carr <steve.carr@wmich.edu> Thu, Nov 20, 2014 04:35 PM
Sender : steve carr <steve.carr@wmich.edu>
Subject : Fwd: MA2300
To : Donna Kaminski <donna.kaminski@wmich.edu>

Here is the support from Math for our 2300 requirement. Are we ready to submit this to Raj.

Steve

Dr. Steven M. Carr
Chair and Professor
Department of Computer Science
Western Michigan University
1903 W. Michigan Ave.
Kalamazoo MI 49008-5466
(269) 276-3101

Begin forwarded message:

Subject: Re: MA2300
From: Gene Freudenburg <gene.freudenburg@wmich.edu>
Date: November 20, 2014 at 4:34:48 PM EST
Cc: Qiji Zhu <qiji.zhu@wmich.edu>
To: Steven Carr <steve.carr@wmich.edu>

Steve,

The Department of Mathematics is happy to lend its support this curricular change proposal. It looks like a positive move for students in the program.

Best of luck, and please let me know if I can help in any other way.

Gene

On Nov 10, 2014, at 8:10 AM, Steven Carr wrote:

Gene,

The CS department is proposing to change one of the math/stat electives that we have to a requirement of MA2300 (Linear Algebra). Would you be willing to provide an email of approval for this change?

Steve

Dr. Steven M. Carr
Chair and Professor
Department of Computer Science
Western Michigan University

1903 W. Michigan Ave.
Kalamazoo MI 49008-5466
(269) 276-3101

Begin forwarded message:

<LinAlg CurrChange Nov2014 .doc>

Dr Gene Freudenburg, Chair
Department of Mathematics
Western Michigan University
1903 W. Michigan Ave
Kalamazoo, MI 49008-5248 USA

phone: 269 387 4551
fax: 269 387 4530

OLD CATALOG COPY

1. Mathematics/Statistics and Laboratory Science

To satisfy CAC/ABET accreditation requirements, all students must complete at least thirty credit hours of mathematics, statistics and laboratory science requirements which must include one approved laboratory science and a minimum of 15 credit hours in mathematics/statistics. Mathematics/statistics course work must include:

- MATH 1220 - Calculus I **Credits:** 4 hours
- Or
- MATH 1700 - Calculus I, Science and Engineering **Credits:** 4 hours
- STAT 2600 - Statistics Using R **Credits:** 4 hours
- CS 1310 - Foundations of Computer Science **Credits:** 4 hours

NEW CATALOG COPY

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- Or
- MATH 1700 - Calculus I, Science and Engineering **Credits:** 4 hours
- MATH 2300 – Elementary Linear Algebra **Credits**: 4 hours
- STAT 2600 - Statistics Using R **Credits:** 4 hours
- CS 1310 - Foundations of Computer Science **Credits:** 4 hours

OLD CATALOG COPY

Fourth Semester (16 hours)

General Education Credits: **4 hours**

- MATH/STAT Approved Elective **Credits:** 4 hours
- Free Elective **Credits:** 3 hours

- CS 2240 - System Programming Concepts **Credits:** 3 hours
- CS 3310 - Data and File Structures **Credits:** 3 hours

NEW CATALOG COPY

Fourth Semester (16 hours)

General Education **Credits:** 4 hours

- MATH 2300 Elementary Linear Algebra **Credits:** 4 hours
- Free Elective **Credits:** 3 hours

- CS 2240 - System Programming Concepts **Credits:** 3 hours
- CS 3310 - Data and File Structures **Credits:** 3 hours

Catalog Copy

Requirements

Students enrolling in the Computer Science Program are required to own a laptop computer with minimum specifications set by the department. By April of each year, the department will establish specifications of laptops for students entering in the following fall. These specifications will be posted on the department website.

Candidates for the Bachelor of Science in Computer Science must satisfy the following requirements in addition to those required by Western Michigan University:

1. Mathematics/Statistics and Laboratory Science

To satisfy CAC/ABET accreditation requirements, all students must complete at least thirty credit hours of mathematics, statistics and laboratory science requirements which must include one approved laboratory science and a minimum of 15 credit hours in mathematics/statistics. Mathematics/statistics course work must include:

MATH 1220 - Calculus I Credits: 4 hours

Or

MATH 1700 - Calculus I, Science and Engineering Credits: 4 hours

STAT 2600 - Statistics Using R Credits: 4 hours

CS 1310 - Foundations of Computer Science Credits: 4 hours

MA2300 – Elementary Linear Algebra Credits: 4 hours Insert

Students may meet the laboratory science requirement by taking one of the following:

BIOS 1610 - Molecular and Cellular Biology Credits: 4 hours

CHEM 1100 - General Chemistry I Credits: 3 hours

And

CHEM 1110 - General Chemistry Laboratory I Credits: 1 hour

GEOS 1300 - Physical Geology Credits: 4 hours

PHYS 2050 - University Physics I Credits: 4 hours

And

PHYS 2060 - University Physics I Laboratory Credits: 1 hour

Remaining Mathematics/Statistics and Laboratory Science:

The remaining required courses in laboratory science, mathematics and statistics must be approved by a department advisor.