CEAS-14-CS-055

REQUEST TO COLLEGE CURRICULUM COMMITTEE FOR CURRICULAR IMPROVEMENTS

DEPARTMENT: CS **PROPOSED EFFECTIVE SEMESTER:** Spring 2015 **COLLEGE:** CEAS

PROPOSED IMPROVEMENTS

Academic Program
- ☐ New degree*
- ☐ New major*
- ☐ New curriculum*
- ☐ New concentration*
- ☐ New certificate
- ☐ New minor
- ☐ 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:** A minimum grade of B in the prerequisite courses

Title of degree, curriculum, major, minor, concentration, or certificate:

Existing course prefix and #: CS6810 **Proposed course prefix and #:** **Credit hours:**

Existing course title: Compiling Theory and Practice

Proposed course title: Compiler Optimization

Existing course prerequisite & co-requisite(s): CS5810

Proposed course prerequisite(s) (CS5541 and CS5800) or CS5810

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?

A minimum grade of B in the prerequisite courses.

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 2/27/15

Chair, College Curriculum Committee _____ Date _____

Dean _____ Date: _____ Graduate Dean: _____ Date _____

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.

   This proposed improvement is to make the following changes to CS6810 (Compiler Theory and Implementation): (1) change title to Compiler Optimization, (2) change the prerequisite from CS5810 to (CS5541 and CS5800) or CS5810, and (3) change the catalog description to "Theory, design, and implementation of compiler optimization techniques. Topics include: intermediate representations, advanced code generation, control and data-flow analysis, dynamic compilation, global register allocation,and instruction scheduling. A major project is required."

   A minimum grade of B in the prerequisite courses.

2. Rationale. Give your reason(s) for the proposed improvement. (If your proposal includes prerequisites, justify those, too.)
   - Title. Since the current teaching of the advanced course on compilers focuses on optimization techniques applied during program translation, it is more appropriate to reflect such focus in the course title.
   - Prerequisites. With the most recent addition of three graduate core courses, i.e. CS5310 (Algorithms), CS5410 (Computer Systems), and CS5800 (Theory of Computation), a combination of CS5410 and CS5800 provides sufficient background for CS6810. Therefore we list them as an option in addition to the existing prerequisite of CS5810.
   - Description. The current description, "A study of theoretical and applied strategies for designing compilers and other types of language translation systems. Students will be assigned a programming project on compiling", does not convey the focus of the course. The revised description explicitly states the focus and gives the main topics of the course.

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.

   None.

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

   The perspective students will have a better understanding of what they expect to learn from the course.

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.

   With an additional prerequisite option, more students can take the course.

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 change.

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.)

   None.

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.) N/A

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. N/A

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. N/A

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. N/A

Attachment: Current and Proposed Catalog Descriptions

The current catalog description: [http://catalog.wmich.edu/preview_course_nopop.php?catoid=19&coid=42987]

CS 6810 - Compiling Theory and Practice

A study of theoretical and applied strategies for designing compilers and other types of language translation systems. Students will be assigned a programming project on compiling.

Prerequisites/Corequisites: Prerequisite: CS 5810.

Credits: 3 hrs.

Notes: Open to Graduate Students Only.

The proposed catalog description:

CS 6810 – Compiler Optimization

Theory, design, and implementation of compiler optimization techniques. Topics include: intermediate representations, advanced code generation, control and data-flow analysis, dynamic compilation, global register allocation,and instruction scheduling. A major project is required.

Prerequisites/Corequisites: Prerequisites: (CS5541 and CS5800) or CS5810

Credits: 3 hrs.

Notes: Open to Graduate Students Only.