Curriculum Course Request New Course CYCS 5750 - A-2018-CS-88; effective term: 201940

Steven M Carr
Wed 11/7/2018 10:03 AM

To: Raja G Aravamathan <raja.aravamathan@wmich.edu>; Said M Abubakr <said.abubakr@wmich.edu>;
Cc: Holly Blanks <holly.blanks@wmich.edu>;

Please verify your data for New Curriculum Course Request for department: CS; college: A.
Go to the following URL to complete your worklist items: https://bwfp1.cc.wmich.edu:7102/wfbprod

Date of request: 15-OCT-2018

Request ID: A-2018-CS-88

College: A

Department: CS

Initiator name: Jason Johnson

Initiator email: jason.e.johnson@wmich.edu

Proposed effective term: 201940

Does course need General Education approval?: N

Will course be used in teacher education?: N

If 5000 level course, prerequisites apply to: B

Proposed course data:
New Course CYCS 5750
New course selected: This new course is not seeking approval as a general education course.

1. Proposed course prefix and number:
   CYCS 5750

2. Proposed credit hours:
   3

3. Proposed course title:
   Software Development for Cybersecurity

4. Proposed course prerequisites:
   (CS 5710 OR CYCS 5710) AND (CIS 5710 OR CYIS 5710)
5. Proposed course corequisites:
none

6. Proposed course prerequisites that may be taken concurrently (before or at the same time):
none

7. Minimum grade for prerequisites (default grades are D for Undergrad and C for Grad):
C

8. Major and/or minor restrictions:
Include

9. List all the four-digit major and/or minor codes (from Banner) that are to be included or excluded:
Major Code Restriction for New B.S. in Cybersecurity

10. Classification restrictions:
Not Applicable

11. List all the classifications (freshman, sophomore, junior, senior) that are to be included or excluded:
none

12. Level restriction:
Not Applicable

13. List the level (undergraduate, graduate) that is to be included or excluded.
Not Applicable

14. Do prerequisites and corequisites for 5000-level courses apply to undergraduates, graduates, or both?
Both

15. Is this a multi-topic course?
No

16. Proposed course title to be entered in Banner:
Software Dev for Cybersec

17. Is this course repeatable for credit?
No

18. Is this course mandatory credit/no credit?
No

19. Select class type:
Lecture/Lab/Discussion

20. How many contact hours per week for this course?
3

A. Please choose Yes or No to indicate if this class is a Teacher Education class:
No
B. Please choose the applicable class level:
   Both

C. Please respond Yes if this is a current general education course and/or a course being submitted for the new WMU Essential Studies program. Please respond No if it is neither.
   No

D. Explain briefly and clearly the proposed improvement.
   Create the course CYCS 5750 as part of the Master of Science in Information Security.

   CYCS 5750 is a foundation course that will be offered by the Computer Science Department as part of the cross-disciplinary online M.S in Information Security degree.

   It is distinct from CS 5750 - Secure Software Development in the approach and focus of the material. CS 5750 delves deeply into the technical specifics of secure coding, including bit-level representations of various types of data, access control methods, and web and network security from a programmer's point of view. CYCS 5750 will focus on common errors made in the Software Development Life Cycle, mapping the attack surface of software packages, using static and dynamic analysis tools to determine security vulnerabilities, and creating software development policy. CYCS 5750 will differ significantly from any other class offered by the Department of Computer Science and is required for the Master of Science and Graduate Certificate in Information Security.

   E. Rationale. Give your reason(s) for the proposed improvement. (If your proposal includes prerequisites, justify those, too.)
   This will separate the Information Security course from the course appropriate for Computer Science students. This will avoid confusion and allow the courses to be tailored to the appropriate audiences. CYCS 5750 is required in order to deliver content appropriate to Information Security students that is not delivered in any currently existing course.

   F. List the student 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.
   • The student will be able to determine memory layout for local, global and dynamically allocated variables.
   • The student will be able to identify the vulnerabilities associated with the implementation of strings in the C language.
   • The student will be able to demonstrate a buffer overflow attack and show how to accomplish arc injection and code injection.
   • The student will be able to demonstrate the effects of integer underflow and overflow on program security.
   • The student will be able to demonstrate the effects of file I/O concurrency on security.
   • The student will be able to implement the principle of least privilege.
   • The student will be able to implement the principles of secure software design.
   • The student will be able to recommend software development policy to augment security.

   G. Describe how this curriculum change is a response to student learning assessment outcomes that are part of a departmental or college assessment plan or informal assessment activities.
   This will help to avoid confusion among CS and Information Security students as to which courses are acceptable as part of their respective courses of study.

   H. 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.
   No effect on other departments or colleges. Students in the CS program will face less confusion about which classes are appropriate to their course of study.

   I. Effect on your department's programs. Show how the proposed change fits with other departmental offerings.
   Students in the CS program will face less confusion about which classes are appropriate to their course of study.
J. 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. This will not affect the requirements for current or future students.

K. 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? Not applicable.

L. 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.) No effect on resources.

M. With the change from General Education to WMU Essential Studies, this question is no longer used.

For courses requesting approval as a WMU Essential Studies course, a syllabus identifying the student learning outcomes and an action plan for assessing the student learning outcomes must be attached in the Banner Workflow system. Not Applicable

N. (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. Not applicable.

O. Current catalog copy: Not applicable.

P. Proposed catalog copy:
This course covers the theory and practice of software security, focusing on common software security risks: including: identification of potential threats and vulnerabilities, methods and tools for identifying and eliminating security vulnerabilities and coding principles to avoid security holes in new software. The course covers essential guidelines for building secure software: how to design software with security in mind from the ground up and to integrate analysis and risk management throughout development.

Department Curriculum Chair approver: Jason Johnson

Department Curriculum Chair comment:

Date: 07-NOV-2018

Department approver: Steve Carr

Chair comment:

Date: 07-NOV-2018