BOARD OF REGENTS
EASTERN MICHIGAN UNIVERSITY

RECOMMENDATION

NEW ACADEMIC PROGRAM: COMPUTER SCIENCE, BACHELOR OF ARTS

ACTION REQUESTED

It is recommended that the Board of Regents approve a New Academic Program: Computer Science (Bachelor of Arts).

STAFF SUMMARY

The *Bachelor of Arts in Computer Science* provides an alternative path to the University's existing Bachelor of Science programs in Computer Science. The program is designed for those students who want a solid background in computer science (CS), but who also wish to pursue a significant depth of knowledge in other disciplines that support different technology-based careers. The program requires fewer CS-specific credits than the BS, providing greater flexibility to students' overall curricula. No new courses were created in support of this pathway.

PROPOSAL ELEMENTS

Rationale   Many of our peer institutions (Ball State, Bowling Green, Central Michigan, University of Delaware, etc.) offer both BA and BS degrees in Computer Science.

Gov. Snyder's "Marshall Plan for Talent" acknowledges that there is demand in the state for additional opportunities for IT and computer science education by calling for:
- $15 million for a new Michigan IT & Computer Science Promise scholarship... for students enrolled in a computer science or IT credential program.
- $15 million in curriculum development grants for colleges and universities to position Michigan as a leader in talent development for the IT industry.

The 2016 "Technology Industry Report" by Automation Alley (the leading trade group of high tech industries in Michigan) predicted that 82% of its members expected to hire additional workers and that 83% planned to increase their research and development programs.

Program	Eastern would be one of the only universities in our seven (7) county Southeast
Distinction	Michigan region offering a Bachelor of Arts in Computer Science.

Curriculum   The proposed Major requires students to complete 48 credit hours in the major and
Design   20 hours in a required minor. Students will become adept at solving novel
               problems through careful analysis and the design and development of software
               systems.

Projected   The Computer Science Department expects this program to significantly increase
Enrollment   the number of students that are engaged in a COSC program. The Department
               hopes that the program appeals to students who are interested in computer science
               but are daunted by the number of credits required in the Department's existing BS
               programs. It should also draw students who want to bring digital approaches to the
               Arts and Humanities.

               The existing BS programs consist of around 400 students, and the Department
               expects to add another 20% (about 80 students), within the next three years,
               amounting to approximately 20 graduates per year.

               Because this program is built using existing courses the projected scheduling needs
               and patterns should be the same as those already existing, though it is likely that to
               accommodate the additional students an additional section of COSC 111 and 211
               will be offered each semester along with one additional section of COSC 481 each
               year.

FISCAL IMPLICATIONS

The current Academic Affairs budget will absorb program costs.

ADMINISTRATIVE RECOMMENDATION

The proposed Board action has been reviewed and is recommended for Board approval.

University Executive Officer   11/26/18
Rhonda Longworth, Ph.D.   Date

Computer Science [BA]

New Program | effective date TBD

The effective date will be determined following consideration by the Academic Officers Committee, Michigan Association of State Universities and the Eastern Michigan University Board of Regents.

The Bachelor of Arts in Computer Science is designed for students who seek a liberal arts education combined with a solid foundation in computer science.

Learn

Students pursuing a Bachelors of Art in Computer Science will become adept at solving novel problems through careful analysis and the design and development of software systems.

Opportunities

The program offers a mix of practice and theory that prepares students for career employment in computer science fields such as systems programming and analysis, software development and maintenance, as well as applications programming.

The department encourages majors to be part of an active student community, including by joining student organizations within the department. The professors encourage you to do undergraduate research and present at the Undergraduate Research Symposium and/or local computer conferences.

Department Information

Computer Science, *College of Arts & Sciences*

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General Education Requirements:

For specific requirements, see General Education or print a worksheet.

Major Requirements: 48 Hours

Required Mathematics Course: 3 hours

- MATH 105 - College Algebra [GEQR] 3 hrs

Required Computer Science Courses: 33 hours

- COSC 111 - Introduction to Programming 3 hrs
- COSC 112 - Introduction to Programming Online Lab 1 hr
- COSC 211 - Programming Data Structures 3 hrs
- COSC 212 - Programming Data Structures Online Lab 1 hr
- COSC 221 - Computer Organization I 3 hrs
- COSC 231 - Internet-based Computing 3 hrs
- COSC 311 - Algorithms and Data Structures 4 hrs
- COSC 314 - Computational Discrete Structures 4 hrs
- COSC 341 - Programming Languages 4 hrs
- COSC 381 - Software Engineering Solutions 4 hrs
- COSC 481W - Software Engineering and Senior Project [GEWI] 3 hrs

Restricted Elective Courses: 12 hours

Choose one course from the following

- COSC 374 - Applied Cryptography 4 hrs
- COSC 421 - Systems Programming 4 hrs
- COSC 423 - Computer Operating Systems 4 hrs
- COSC 426 - Software Development for Mobile Devices 4 hrs
- COSC 436 - Web Programming 4 hrs
- COSC 439 - Computing Network Principles 4 hrs
- COSC 445 - Compiler Construction 4 hrs
- COSC 456 - Computer Graphics 4 hrs
- COSC 457 - Computer Game Programming 4 hrs
- COSC 461 - Heuristic Programming 4 hrs
- COSC 471 - Database Principles 4 hrs

Choose two courses from the list below or above, not already taken

- COSC 315 - Symbolic Computing 4 hrs
- COSC 321 - Computer Organization II 4 hrs
- COSC 405 - Switching Theory 4 hrs
- COSC 411 - Algorithm Design and Analysis 4 hrs
- COSC 422 - Introduction to Microprocessors 4 hrs
- COSC 444 - Foundations of Automata and Languages 4 hrs
- COSC 462 - Introduction to Information Retrieval 4 hrs
- COSC 472 - Big Data I 4 hrs
- COSC 473 - Big Data II 4 hrs
- COSC 480 - Special Topics 4 hrs

Minor Requirement:

This major requires a minor.

For a list of available minors, please see Academic Programs or contact your major advisor.

Program Total:

Students must earn a minimum total of 124 credits at the 100-level or above.

Critical Graduation Information

The following are minimum requirements for all bachelor's degrees awarded by Eastern Michigan University. Some majors and minors require more than the minimum in one or more of the areas below; students are urged to consult the online catalog for the requirements of their particular programs.

- Earn a minimum total of 124 credits at the *100-level and above*. **Courses with numbers below 100 will not be counted toward this degree requirement. At most 8 credit hours of physical education (PEGN) activity courses will be counted toward this requirement.**
- Meet the requirements of the General Education program (see *information below*).
- Complete a Writing Intensive (GEWI) Course in your major.
- Earn a minimum of 60 credits from a four-year college or university; **courses taken at community colleges cannot be used to meet this requirement.** (Some formal program-to-program articulation agreements modify this requirement. See specific agreements for details.)
- Earn a minimum of 30 credits from courses taken at EMU.
- Complete 10 of the last 30 hours for the degree from courses taken at EMU.
- Have a minimum of 30 *unique* credit hours in their major and 20 *unique* credit hours in their minor for a total of at least 50 unique credit hours between them. Some majors that require 50 or more hours themselves do not require a minor; students should check requirements of the selected major in the undergraduate catalog to see if a minor is required.
- Earn no more than 60 credit hours in one subject area (prefix). Credits in excess of the 60 maximum will not be counted toward the minimum of 124 credits required for a bachelor's degree.
- Earn the minimum number of credits in 300-level and above courses in each major and minor as specified below - these credits must be earned in distinct courses; that is, no course can be used to fulfill this requirement in more than one major or minor.
  - Earn a minimum of 6 credits in 300-level or higher courses at EMU in each minor
  - Earn a minimum of 9 credits in 300-level or higher courses at EMU in each major that requires a minor.
  - Earn a minimum of 15 credits in 300-level or higher courses at EMU in each major that does not require a minor
- Transfer credit will be awarded for courses taken at colleges and universities that are accredited by one of the recognized regional accrediting bodies only if the courses are college-level (equated to 100-level or above at EMU) and the student earned a "C" (or 2.0 on a 4 point scale) or better. Transfer credit may be awarded on a case-by-case basis for college-level courses in which a "C" (2.0) or better was earned at institutions outside the U.S. or at non-accredited U.S. institutions; the internal review of such courses is conducted by individual departments/schools within EMU, and additional documentation may be required. *Please note:* EMU awards only credit for transferred courses; grades are not used in the calculation of an EMU GPA.
- Earn a minimum cumulative GPA of 2.0 in courses taken at EMU in order to graduate. In addition, a minimum cumulative GPA of 2.0 must be reached in each major and minor. Only courses taken at EMU and those applied to a student's major or minor will be used in the calculation of their major and minor cumulative GPAs. (Note: some programs may require a higher GPA - check with your program advisor.)

General Education Requirements EMU's General Education Program requires students to choose from a menu of approved courses in several different areas; do not assume that other courses in the same department or with similar names will fulfill these requirements. A detailed description of General Education requirements is available in the General Education section of the catalog.

Students who transferred to EMU may have modified general education requirements based on Michigan Transfer Agreement (MTA) or articulation agreements; consult your academic advisor for additional information.