

14-169a  
 Provost: App 4/14/15  
 UWUCC: AP 4/14/15  
 Senate App- 4/28/15

## Program Revision Template

Steps to the approval process:

1. Complete the applicable template(s) and email them to the departmental or program curriculum committee chair.
2. The curriculum chair emails the proposal to the curriculum committee, then to the department/program faculty for a vote and finally to the department/program chair.
3. The department/program chair emails the proposal to [curriculum-approval@iup.edu](mailto:curriculum-approval@iup.edu); this email will also serve as an electronic signature.
4. Curriculum committee staff will log the proposal, forward it to the appropriate dean's office(s) for review within 14 days and post it on the X Drive for review by all IUP faculty and administrators. Following the dean's review the proposal goes to the UWUCC/UWGC and the Senate.
5. Questions? Email [curriculum-approval@iup.edu](mailto:curriculum-approval@iup.edu).

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Proposing Depart/Unit:	Computer Science	Phone:	724-357-4492

Program Revisions (Check all that apply):  Program Revision     Program Title Change     Catalog Description Change     Credit Hour Change

Liberal Studies Requirement Changes     Variability of Delivery     Other: [Click here to enter text.](#)

Current Program Information		Proposed Changes	
Current Program Title	Bachelor of Science - Computer Science/Languages and Systems Track	Proposed Program Title <i>(if changing)</i>	<a href="#">Click here to enter text.</a>
Current Narrative Catalog Description	<a href="#">Click here to enter text.</a>	Proposed Narrative Catalog Description <i>(if changing)</i>	<a href="#">Click here to enter text.</a>
Current Program Requirements	<p><b>Bachelor of Science - Computer Science/ Languages and Systems Track</b></p> <p><b>Liberal Studies:</b> As outlined in Liberal Studies section with the following specifications: <span style="float: right;"><b>44</b></span>  <b>Natural Science: 8cr</b>, must choose two lab science sequence  <b>Mathematics: 3cr</b>, MATH 125 (1)  <b>Liberal Studies Electives: 3cr</b>, MATH 126 (1), no courses with COSC prefix.</p> <p><b>Major:</b> <span style="float: right;"><b>48</b></span>  <b>Core Courses:</b>                      COSC 105 Fundamentals of Computer Science <span style="float: right;">3cr</span></p>	Proposed Program Requirements <i>(if changing)</i>	<p><b>Bachelor of Science - Computer Science/ Languages and Systems Track</b></p> <p><b>Liberal Studies:</b> As outlined in Liberal Studies section with the following specifications: <span style="float: right;"><b>44</b></span>  <b>Natural Science: 8cr</b>, must choose two lab science sequence  <b>Mathematics: 3cr</b>, MATH 125 (1)  <b>Liberal Studies Electives: 3cr</b>, MATH 126 (1), no courses with COSC prefix.</p> <p><b>Major:</b> <span style="float: right;"><b>48-49</b></span>  <b>Core Courses:</b>                      COSC 105 Fundamentals of Computer Science <span style="float: right;">3cr</span></p>

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<p>COSC 110 Problem Solving and Structured Programming 3cr            COSC 210 Object-Oriented and GUI Programming 3cr            COSC 300 Computer Organization and Assembly Language 3cr            COSC 310 Data Structures and Algorithms 3cr            COSC 319 Software Engineering Concepts 3cr            COSC 341 Intro to Database Management Systems 3cr            COSC 380 Seminar in Computing Profession and Ethics 2cr            COSC 480 Seminar on Technical Topics 1cr</p> <p><b>Required Courses:</b>            COSC 345 Computer Networks 3cr            COSC 432 Introduction to Operating Systems 3cr            COSC 460 Theory of Computation 3cr</p> <p><del><b>Electives:</b> 15cr from the following elective courses:</del>            COSC/MATH 250 Introduction to Numerical Methods (4) 3cr            COSC 316 Host Computer Security 3cr            COSC 473 Software Engineering Practice <i>or</i> 3-6cr                COSC 493 Internship in Computer Science (2)            COSC 355 Computer Graphics 3cr            COSC 356 Network Security 3cr            COSC 362 Unix Systems 3cr            COSC 365 Web Architecture and Application Development 3cr            COSC 405 Artificial Intelligence 3cr            COSC 410 Computer Architecture 3cr            COSC 420 Modern Programming Languages <i>or</i> 3cr                COSC 424 Compiler Construction            COSC 465 Distributed Processing and Web Services 3cr            COSC 481 Special Topics in Computer Science (only sections approved for majors) 1-4cr</p> <p><b>Other Requirements</b> 25  <del>ENGL 222 Technical Writing 3cr</del>  <del>One Science with lab in addition to the Liberal Studies requirement 4cr</del></p> <p><b>Mathematics:</b> A minor in mathematics including 48cr            the following courses: (3)            MATH 171 Introduction to Linear Algebra            MATH 216 Probability and Statistics for Natural Sciences            MATH 219 Discrete Mathematics            MATH 225 Calculus III for Physics, Chemistry &amp; Mathematics <i>or</i>                MATH 250 Introduction to Numerical Methods (4)</p> <p><b>Free Electives:</b> 3</p> <p><b>Total Degree Requirements:</b> 120</p>	<p>COSC 110 Problem Solving and Structured Programming 3cr            COSC 210 Object-Oriented and GUI Programming 3cr            COSC 300 Computer Organization and Assembly Language 3cr            COSC 310 Data Structures and Algorithms 3cr            COSC 319 Software Engineering Concepts 3cr            COSC 341 Intro to Database Management Systems 3cr            COSC 380 Seminar in Computing Profession and Ethics 2cr            COSC 480 Seminar on Technical Topics 1cr</p> <p><b>Languages &amp; Systems Required Courses:</b>            COSC 345 Computer Networks 3cr            COSC 432 Introduction to Operating Systems 3cr            COSC 460 Theory of Computation 3cr</p> <p><b>Controlled Electives:</b> 9-10cr from the following: (5,6)            COSC 220 Applied Computer Programming 4 cr            COSC/MATH 250 Introduction to Numerical Methods (4) 3cr            COSC 316 Host Computer Security 3cr            COSC 355 Computer Graphics 3cr            COSC 356 Network Security 3cr            COSC 362 Unix Systems 3cr            COSC 365 Web Architecture and Application Development 3cr</p> <p><b>Upper-level Electives:</b> 6cr from the following: (6)            COSC 405 Artificial Intelligence 3cr            COSC 410 Computer Architecture 3cr            COSC 420 Modern Programming Languages <i>or</i> 3cr                COSC 424 Compiler Construction            COSC 430 Systems Programming 3cr            COSC 465 Distributed Processing and Web Services 3cr            COSC 473 Software Engineering Practice <i>or</i> 3-6cr                COSC 493 Internship in Computer Science (2)            COSC 481 Special Topics in Computer Science (only sections approved for majors) 1-4cr</p> <p><b>Other Requirements</b> 12  <b>Mathematics:</b> A minor in mathematics including 12cr            the following courses: (3)            MATH 171 Introduction to Linear Algebra            MATH 216 Probability and Statistics for Natural Sciences            MATH 219 Discrete Mathematics            MATH 225 Calculus III for Physics, Chemistry &amp; Mathematics <i>or</i>                MATH 250 Introduction to Numerical Methods (4)</p> <p><b>Free Electives:</b> 15-16</p> <p><b>Total Degree Requirements:</b> 120</p>
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	<ul style="list-style-type: none"> <li>(1) MATH 125 and 126 can be substituted by MATH 121 and 122.</li> <li>(2) COSC 493 may be selected after completion of sophomore year. Note: Only 3cr of first 6cr of COSC 493 or 6cr of a total 12cr of COSC 493 can be counted towards COSC electives.</li> <li>(3) MATH 125 and 126 (taken as Liberal Studies requirements) are also counted towards the minor.</li> <li>(4) COSC/MATH 250 may be counted as a Computer Science elective or as a part of the Mathematics minor, but not both.</li> </ul>		<ul style="list-style-type: none"> <li>(1) MATH 125 and 126 can be substituted by MATH 121 and 122.</li> <li>(2) COSC 493 may be selected after completion of sophomore year. Note: Only 3cr of first 6cr of COSC 493 or 6cr of a total 12cr of COSC 493 can be counted towards COSC electives.</li> <li>(3) MATH 125 and 126 (taken as Liberal Studies requirements) are also counted towards the minor.</li> <li>(4) COSC/MATH 250 may be counted as a Computer Science elective or as a part of the Mathematics minor, but not both.</li> <li>(5) <i>Upper-level electives may be counted as controlled electives. 3cr of Intermediate Level foreign language may be applied toward controlled electives.</i></li> <li>(6) <i>Controlled and upper level electives may not be applied toward more than one track in Computer Science.</i></li> </ul>
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**Rationale for Proposed Changes**

<p>Why is the program being revised?</p>	<p>This program revision represents the department's effort to comply with PASSHE Policy 1990-06-A which limits a Bachelor of Science degree to no more than 60 semester credit hours in courses required by the major, including required cognate courses in related disciplines. The revision also adds minor adjustments the controlled and upper level electives to limit the ability to apply credit for a single class to multiple tracks in Computer Science. The specifics are:</p> <ul style="list-style-type: none"> <li>a. Remove ENGL 222 as an additional writing requirement. This was done to reduce the number of required credits to 60.</li> <li>b. Remove third lab science which is no longer required by ABET accreditation as an additional requirement. This was done reduce the number of required credits to 60.</li> <li>c. Computer science electives have been divided into 2 categories: Controlled Electives and Upper-level electives. This requires students to take some 400-level courses as electives. This was done so that the curriculum divisions correspond to the other tracks in Computer Science. Note (5) was added to clarify the separation and allow upper-level electives to serve as controlled electives.</li> <li>d. Add COSC 220 to the list of controlled electives. This provides more flexibility for computer science majors changing tracks. The other tracks require COSC 220 and a student changing from another track currently cannot apply COSC 220 credits to the Languages and Systems track.</li> </ul>
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	<ul style="list-style-type: none"> <li>e. Add COSC 430 to the list of Upper-level Electives. This course is being updated in a separate course revision and will now be an appropriate elective for this track.</li> <li>f. Add note (6) to limit the ability to apply credit for a single class to multiple tracks in Computer Science.</li> <li>g. Change number of additional credits for Math minor from 18 to 12 to correct error currently in catalog.</li> </ul>
<p>Identify the <b>Program</b> Student Learning Outcomes (SLO). Mark any SLOs that are changing as a part of the Program Revision.</p>	<p>Students in a Computer Science track should set their goals beyond simple programming and should be preparing to</p> <ol style="list-style-type: none"> <li>1. apply computer science knowledge to application areas from science and industry;</li> <li>2. apply appropriate data structures and algorithms to analyze and solve new problems;</li> <li>3. apply software engineering techniques to designing, implementing, documenting, testing, and maintaining software systems;</li> <li>4. contribute to improving the design and implementation of databases;</li> <li>5. use more than one programming language and choose an appropriate one for the project;</li> <li>6. work with and communicate effectively with professionals in various fields;</li> <li>7. continue a lifelong professional development in computing;</li> <li>8. act ethically and professionally.</li> </ol> <p>A graduate of this track will be prepared to</p> <ol style="list-style-type: none"> <li>1. improve (a) the software tools that programmers and analysts use, (b) operating systems, (c) Web-based applications and interfaces, and (d) networks and system security;</li> <li>2. develop (a) better languages for communicating with computers and (b) software that takes computer organization into account, and enter graduate studies.</li> </ol> <p>There are no changes to the SLOs.</p>

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<p>Implication of the Change on:</p> <ul style="list-style-type: none"><li>- Program</li><li>- Other programs</li><li>- Current Students</li></ul>	<p>There is no effect on this program or current students.</p> <p>This change may affect the enrollment in ENGL 222 and some natural science lab courses. While the department is reluctant to remove those requirements, it is necessary to reduce the number of cognate credits as required by the Board of Governors.</p>
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