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| For Academic Affairs and Research Use Only |
| CIP Code:  |  |
| Degree Code: |  |

 **Bulletin / Banner Change Transmittal Form**

**[X] Undergraduate Curriculum Council**

**[ ] Graduate Council**

Signed paper copies of proposals submitted for consideration are no longer required. Please type approver name and enter date of approval.

Email completed proposals to curriculum@astate.edu for inclusion in curriculum committee agenda.

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| Jake A. Qualls | 11/4/2019 |

**Department Curriculum Committee Chair** |

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**COPE Chair (if applicable)** |
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| Hung-Chi Su | 11/4/2019 |

**Department Chair:**  |

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**Head of Unit (If applicable)**   |
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| Jason Stewart | 11/11/2019 |

**College Curriculum Committee Chair** |

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**Undergraduate Curriculum Council Chair** |
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| Abhijit Bhattacharyya | 11/12/2019 |

**College Dean** |

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**Graduate Curriculum Committee Chair** |
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**General Education Committee Chair (If applicable)**   |

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**Vice Chancellor for Academic Affairs** |

**1.Contact Person** (Name, Email Address, Phone Number)

Hung-Chi Su, suh@astate.edu, 8119

**2.Proposed Change**

Clarification of CS electives and course prerequisites.

**3.Effective Date**

Spring 2020

**4.Justification –** *Please provide details as to why this change is necessary.*

The changes to elective requirements makes it explicit that no lower level hours may be used. The course prerequisite changes add alternatives.

**Computer Science (CS)**

**Bulletin Changes**

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| **Instructions**  |
| **Please visit** [**http://www.astate.edu/a/registrar/students/bulletins/index.dot**](http://www.astate.edu/a/registrar/students/bulletins/index.dot) **and select the most recent version of the bulletin. Copy and paste all bulletin pages this proposal affects below. Follow the following guidelines for indicating necessary changes.** **\*Please note: Courses are often listed in multiple sections of the bulletin. To ensure that all affected sections have been located, please search the bulletin (ctrl+F) for the appropriate courses before submission of this form.** - Deleted courses/credit hours should be marked with a red strike-through (~~red strikethrough~~)- New credit hours and text changes should be listed in blue using enlarged font (blue using enlarged font). - Any new courses should be listed in blue bold italics using enlarged font (***blue bold italics using enlarged font***)*You can easily apply any of these changes by selecting the example text in the instructions above, double-clicking the ‘format painter’ icon 🡪 , and selecting the text you would like to apply the change to.**Please visit* [*https://youtu.be/yjdL2n4lZm4*](https://youtu.be/yjdL2n4lZm4) *for more detailed instructions.* |

**Computer Science (CS)**

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| University Requirements:  |  |
| See University General Requirements for Baccalaureate degrees (p. 42)  |  |
| First Year Making Connections Course:  | Sem. Hrs.  |
| CS 1093, Making Connections - Computer Science  | 3  |
| General Education Requirements:  | Sem. Hrs.  |
| See General Education Curriculum for Baccalaureate degrees (p. 78) Students with this major must take the following: MATH 1023, College Algebra or MATH course that requires MATH 1023 as a prerequisite PHYS 2034, University Physics I OR PHYS 2054, General Physics I ECON 2313, Principles of Macroeconomics OR ECON 2333, Economic Issues & Concepts COMS 1203, Oral Communication (Required Departmental Gen. Ed. Option)  | 35  |
| Major Requirements:  | Sem. Hrs.  |
| CS 1114, Concepts of Programming  | 4  |
| CS 2114, Structured Programming  | 4  |
| CS 2124, OOP and Fundamental Data Structures  | 4  |
| CS 3113, Algorithms and Advanced Data Structures  | 3  |
| CS 3233, Operating Systems  | 3  |
| CS 4113, Software Engineering  | 3  |
| CS 4143, Java and Application Development  | 3  |
| CS 4313, Computer Networks  | 3  |
| CS 4543, Database Systems  | 3  |
| ENG 3043, Technical Writing  | 3  |
| MATH 2183, Discrete Structures  | 3  |
| MATH 2204, Calculus I OR MATH 2143, Business Calculus OR MATH 2194, Survey of Calculus  | 3-4  |
| PHIL 3723, Computers, Ethics, and Society  | 3  |
| STAT 3233, Applied Statistics I  | 3  |
| Upper-level Computer Science Electives ~~CS 1013 may not be used to satisfy this requirement.~~ MATH 4533 may be used to satisfy this requirement  | 12  |

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| University Requirements:  |  |
| See University General Requirements for Baccalaureate degrees (p. 42)  |  |
| First Year Making Connections Course:  | Sem. Hrs.  |
| CS 1093, Making Connections - Computer Science  | 3  |
| General Education Requirements:  | Sem. Hrs.  |
| See General Education Curriculum for Baccalaureate degrees (p. 78) Students with this major must take the following: MATH 2204, Calculus I PHYS 2034, University Physics I OR PHYS 2073 AND 2071, Fundamental Physics and Laboratory ECON 2313, Principles of Macroeconomics OR ECON 2333, Economic Issues & Concepts COMS 1203, Oral Communication (Required Departmental Gen. Ed. Option)  | 36  |
| Major Requirements:  | Sem. Hrs.  |
| CHEM 1013 AND CHEM 1011, General Chemistry I and Laboratory  | 4  |
| CS 2114, Structured Programming  | 4  |
| CS 2124, OOP and Fundamental Data Structures  | 4  |
| CS 3113, Algorithms and Advanced Data Structures  | 3  |
| CS 3123, Programming Languages  | 3  |
| CS 3223, Computer Organization  | 3  |
| CS 3233, Operating Systems  | 3  |
| CS 4113, Software Engineering  | 3  |
| CS 4143, Java and Application Development  | 3  |
| CS 4543, Database Systems  | 3  |
| CS 4713, Analysis of Algorithms  | 3  |
| EE 3333 AND EE 3331, Digital Electronics I and Laboratory  | 4  |
| ENG 3043, Technical Writing  | 3  |
| MATH 2183, Discrete Structures  | 3  |
| MATH 2214, Calculus II  | 4  |
| MATH 3243, Linear Algebra  | 3  |
| PHIL 3723, Computers, Ethics, and Society  | 3  |
| PHYS 2044, University Physics II OR PHYS 2083 AND 2081, Fundamental Physics II and Laboratory  | 4  |
| STAT 3233, Applied Statistics I  | 3  |
| Upper-level Computer Science Electives ~~CS 1013 and CS 1114 may not be used to satisfy this requirement.~~  MATH 4533 may be used to satisfy this requirement  | 12  |
| Sub-total  | 75  |
| Electives:  | Sem. Hrs.  |
| Electives  | 6  |
| Total Required Hours:  | 120  |

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**CS 1013. Introduction to Computers** Applications of computers for general university course work. Elementary operating system usage, creation of data files, spreadsheets for mathematical and scientific data, Internet usage. Corequisite, ~~MATH 0013~~ UC 022V or Math 0013 or higher. Fall, Spring. (ACTS#: CPSI 1003)

**CS 1093. Making Connections Computer Science** Required course for first semester freshmen. Core content includes transition to college, academic performance skills, problem solving, critical thinking, self management, group building skills, and university policies. Content related to the departmental majors is also included. Fall.

**CS 1114. Concepts of Programming** Introduction to problem solving, algorithm development, and structured programming. Emphasis will be placed on problem solving and algorithm development. Designed as a first course for students seeking the Bachelor of Arts in Computer Science as well as non-majors. Prerequisite, ~~MATH 1023~~ score of 24 or above on Math ACT or 590 or above on Math SAT, or MATH 1023 or higher. Fall, Spring.

**CS 2114. Structured Programming** First course in programming, emphasis on programming methodology, procedural abstraction, and top down design. Introduction to string processing, file input and output, recursion, and simple data structures. Prerequisite, C or better in MATH 1023, or Math 1033 or higher. Fall, Spring.

**CS 2124. OOP and Fundamental Data Structures** Second course in programming, emphasis on data abstraction. Introduction to abstract data types and object-oriented programming. Linked lists, stacks, queues and binary trees. Searching and sorting techniques. Prerequisite, C or better in CS 2114. Fall, Spring.

**CS 3113. Algorithms and Advanced Data Structures** Analysis of data structures and associated algorithms. Examination of advanced tree structures, heaps, hashing techniques, and graph algorithms. Prerequisites, C or better in CS 2124 and MATH 2183, and MATH 2204 or MATH 2143 or MATH 2194. Fall, Spring.