**PROGRAM CHANGES**

 WEBER STATE UNIVERSITY

**Submission Date:** September 30, 2014

**Submitter Name:** Dr. Brian Rague, x7377

**College:** College of Applied Science and Technology (COAST)

**Department**: Computer Science

**Program Title:** Bachelor of Science (BS) in Computer Science

Check all that apply:

\_\_\_\_New course(s) required for major, minor, emphasis, or concentration.

\_\_\_\_Modified course(s) required for major, minor, emphasis, or concentration.

\_\_\_\_Credit hour change(s) required for major, minor, emphasis, or concentration.

\_\_\_\_Credit hour change(s) for a course which is required for the major, minor, emphasis, or concentration.

\_\_\_\_Attribute change(s) for any course.

\_\_\_\_Program name change.

\_\_\_\_Deletion of required course(s).

\_\_\_\_Program mode of delivery/format change (Graduate Programs ONLY)

\_\_X\_Other changes (specify) \_Additional Individualized Research Elective\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**JUSTIFICATION:**

The program modification allows for a third option in advanced student individualized study. Currently only cooperative work experience and independent study are offered. The program change introduces faculty research assistantship (CS4850) as an additional option.

Copy the present program from the current catalog and add the required changes (exactly as you wish them to appear in the catalog). Use strikeout (~~strikeout~~) when deleting items in the program and highlight (highlight) when adding items. If multiple changes are being proposed, please provide a summary.

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| **Computer Science (BS)** |
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* **Program Prerequisite:** Completion or equivalent of a Weber State AAS degree in Computer Science and acceptance into the baccalaureate degree program.
* **Minor:** Required for the Customized Option.
* **Grade Requirements:** A grade of “C” or better must be earned in all required CS courses (a grade of “C-” is not acceptable). A grade of “C-” or better must be earned in all required support courses. In addition, an overall GPA of 2.70 or higher must be attained for all required courses.
* **Credit Hour Requirements:** A minimum of 126 credit hours is required for graduation. The actual number of credit hours required for graduation with the customized option varies.

**Advisement**It is strongly suggested that Computer Science students see an advisor on a regular basis. Call the department secretary at 801-626-7929 for an appointment with the advisor.  (Also refer to the [Department Advisor Referral List](http://weber.edu/ssc/academicadvisors.html).)**Admission Requirements into the Bachelor Program**1. Complete an AAS degree in Computer Science or equivalent.
2. Formally declare and be accepted to baccalaureate status through the Department of Computer Science. Specific requirements and details may be obtained from a department advisor.

**General Education**Refer to [Degree and General Education Requirements](http://catalog.weber.edu/content.php?catoid=7&navoid=1244). If a Computer Science major does not have the prerequisite skills at entrance, [NTM 1700](http://catalog.weber.edu/preview_program.php?catoid=7&poid=2581#tt3936) is recommended to fill a portion of the WSU Computer Literacy core general education requirement. The [MATH 1040](http://catalog.weber.edu/preview_program.php?catoid=7&poid=2581#tt6517), or [MATH 1210](http://catalog.weber.edu/preview_program.php?catoid=7&poid=2581#tt1659), or [MATH 3410](http://catalog.weber.edu/preview_program.php?catoid=7&poid=2581#tt9057) course required for the Computer Science AAS degree, which is a pre-requisite to the BS major, also satisfies the WSU core general education Quantitative Literacy requirement. Computer Science majors must complete [COMM 2110](http://catalog.weber.edu/preview_program.php?catoid=7&poid=2581#tt1439) as part of the Humanities general education requirement. It is recommended that Computer Science majors take [CS 1010](http://catalog.weber.edu/preview_program.php?catoid=7&poid=2581#tt6927) for one of the CA general education requirements.*Students who pass the Computer Science Advanced Placement A exam with a score of 3 receive 8 hours of credit and specific credit for CS 1022 (4). Students who pass the Computer Science Advanced Placement A exam with a score of 4 or 5 receive 8 hours of credit and specific credit for CS 1400 (4) (If they already have the CS 1400 (4) course they may receive CS 1023(4)).*  |
| **Major Course Requirements for BS Degree***To be taken in addition to the requirements for the AAS degree in Computer Science.*[*Computer Science Course Descriptions*](http://catalog.weber.edu/preview_content.php?catoid=7&nav_oid=1097)**Required Courses (24 credit hours)*** [CS 3100 - Operating Systems](http://catalog.weber.edu/preview_program.php?catoid=7&poid=2581) **Credits:** **(4)**

 * [CS 3230 - Object Oriented User Interface Development with Java](http://catalog.weber.edu/preview_program.php?catoid=7&poid=2581) **Credits:** **(4)** or
* [CS 3280 - Object Oriented Windows Application Development](http://catalog.weber.edu/preview_program.php?catoid=7&poid=2581) **Credits:** **(4)**

 * [CS 3550 - Advanced Database Programming](http://catalog.weber.edu/preview_program.php?catoid=7&poid=2581) **Credits:** **(4)**
* [CS 3750 - Software Engineering II](http://catalog.weber.edu/preview_program.php?catoid=7&poid=2581) **Credits:** **(4)**
* [CS 4110 - Concepts of Formal Languages and Algorithms for Computing](http://catalog.weber.edu/preview_program.php?catoid=7&poid=2581) **Credits:** **(4)**

 * [CS 4790 - ASP.NET Web Programming](http://catalog.weber.edu/preview_program.php?catoid=7&poid=2581) **Credits:** **(4)** or
* [CS 4230 - Java Application Development](http://catalog.weber.edu/preview_program.php?catoid=7&poid=2581) **Credits:** **(4)** or
* [CS 4750 - Advanced Software Engineering Methods](http://catalog.weber.edu/preview_program.php?catoid=7&poid=2581) **Credits:** **(4)** or
* [CS 4350 - Advanced Internet Programming](http://catalog.weber.edu/preview_program.php?catoid=7&poid=2581) **Credits:** **(4)** or
* [CS 4650 - Advanced Game Development](http://catalog.weber.edu/preview_program.php?catoid=7&poid=2581) **Credits:** **(4)**

 * [CS 4899 - Bachelor's Degree Assessment](http://catalog.weber.edu/preview_program.php?catoid=7&poid=2581) **Credits:** **(0)**

**Support Courses Required (10-11 credit hours)*** [ENGL 3100 - Professional and Technical Writing](http://catalog.weber.edu/preview_program.php?catoid=7&poid=2581) **Credits:** **(3)** or
* [NTM 3250 - Business Communication](http://catalog.weber.edu/preview_program.php?catoid=7&poid=2581) **Credits:** **(3)** or
* [ENGL 2250 CA - Creative Writing](http://catalog.weber.edu/preview_program.php?catoid=7&poid=2581) **Credits:** **(3)** or
* [PHIL 1250 HU - Critical Thinking](http://catalog.weber.edu/preview_program.php?catoid=7&poid=2581) **Credits:** **(3)**

 * [MATH 1220 - Calculus II](http://catalog.weber.edu/preview_program.php?catoid=7&poid=2581) **Credits:** **(4)**

 * [PHYS 2300 - Scientific Computing for Physical Systems](http://catalog.weber.edu/preview_program.php?catoid=7&poid=2581) **Credits:** **(3)** or
* [MATH 2210 - Calculus III](http://catalog.weber.edu/preview_program.php?catoid=7&poid=2581) **Credits:** **(4)** or
* [MATH 2270 - Elementary Linear Algebra](http://catalog.weber.edu/preview_program.php?catoid=7&poid=2581) **Credits:** **(3)** or
* [MATH 3160 - Number Theory](http://catalog.weber.edu/preview_program.php?catoid=7&poid=2581) **Credits:** **(3)**

**CS Electives (8 credit hours)***Choose 2 upper division computer science courses (see list of suggested electives). You may not use* [*CS 4800*](http://catalog.weber.edu/preview_program.php?catoid=7&poid=2581#tt9073) *or CS4850 or* [*CS 4890*](http://catalog.weber.edu/preview_program.php?catoid=7&poid=2581#tt6949) *for these electives.* **Other Electives (6 credit hours)***Choose 6 credits of any approved upper division courses from CS, IS&T, NTM, CEET, PHYSICS, BSAD, AND MATH. This may include up to 4 credits maximum in any one of the following courses: ~~of either~~* [*CS 4800*](http://catalog.weber.edu/preview_program.php?catoid=7&poid=2581#tt5148)*, CS4850, or* [*CS 4890*](http://catalog.weber.edu/preview_program.php?catoid=7&poid=2581#tt1663) *(max 6 credits total).***Suggested Upper Division CS Electives**The following suggested electives are provided in order to assist students wishing to specialize in different areas:**Recommended electives for students desiring to pursue a Master's Degree in Computer Science*** [CS 4280 - Computer Graphics](http://catalog.weber.edu/preview_program.php?catoid=7&poid=2581) **Credits:** **(4)**
* [CS 4500 - Artificial Intelligence and Neural Networks](http://catalog.weber.edu/preview_program.php?catoid=7&poid=2581) **Credits:** **(4)**
* [CS 4820 - Compiler Design](http://catalog.weber.edu/preview_program.php?catoid=7&poid=2581) **Credits:** **(4)**

**Recommended electives for students desiring to specialize in Web Development*** [CS 4230 - Java Application Development](http://catalog.weber.edu/preview_program.php?catoid=7&poid=2581) **Credits:** **(4)**
* [CS 4350 - Advanced Internet Programming](http://catalog.weber.edu/preview_program.php?catoid=7&poid=2581) **Credits:** **(4)**
* [CS 4790 - ASP.NET Web Programming](http://catalog.weber.edu/preview_program.php?catoid=7&poid=2581) **Credits:** **(4)**
* [CS 3620 - Server-Side Web Development](http://catalog.weber.edu/preview_program.php?catoid=7&poid=2581) **Credits:** **(4)**
* [CS 3630 - Rich Internet Application Development](http://catalog.weber.edu/preview_program.php?catoid=7&poid=2581) **Credits:** **(4)**

**Recommended electives for students desiring to specialize in Mobile Development*** [CS 3230 - Object Oriented User Interface Development with Java](http://catalog.weber.edu/preview_program.php?catoid=7&poid=2581) **Credits:** **(4)**
* [CS 3260 - Mobile Development for the iPhone](http://catalog.weber.edu/preview_program.php?catoid=7&poid=2581) **Credits:** **(4)**
* [CS 3270 - Mobile Development for Android](http://catalog.weber.edu/preview_program.php?catoid=7&poid=2581) **Credits:** **(4)**

**Recommended electives for students desiring to specialize in Network Security*** [CS 3030 - Scripting Languages](http://catalog.weber.edu/preview_program.php?catoid=7&poid=2581) **Credits:** **(4)**
* [CS 3705 - Protocol Analysis](http://catalog.weber.edu/preview_program.php?catoid=7&poid=2581) **Credits:** **(4)**
* [CS 3805 - Computer and Network Security](http://catalog.weber.edu/preview_program.php?catoid=7&poid=2581) **Credits:** **(4)**
* [CS 3840 - Computer Forensics for Security Assurance](http://catalog.weber.edu/preview_program.php?catoid=7&poid=2581) **Credits:** **(4)**
* [CS 4740 - Security Vulnerabilities and Attack Prevention](http://catalog.weber.edu/preview_program.php?catoid=7&poid=2581) **Credits:** **(4)**

**Alternative Customized Option (35 credit hours) plus a minor or first bachelor's degree****Required Courses (28 credit hours)*** [CS 3230 - Object Oriented User Interface Development with Java](http://catalog.weber.edu/preview_program.php?catoid=7&poid=2581) **Credits:** **(4)** or
* [CS 3280 - Object Oriented Windows Application Development](http://catalog.weber.edu/preview_program.php?catoid=7&poid=2581) **Credits:** **(4)**
* [CS 3550 - Advanced Database Programming](http://catalog.weber.edu/preview_program.php?catoid=7&poid=2581) **Credits:** **(4)**
* [CS 3750 - Software Engineering II](http://catalog.weber.edu/preview_program.php?catoid=7&poid=2581) **Credits:** **(4)**
* [CS 4110 - Concepts of Formal Languages and Algorithms for Computing](http://catalog.weber.edu/preview_program.php?catoid=7&poid=2581) **Credits:** **(4)**

 * [CS 4230 - Java Application Development](http://catalog.weber.edu/preview_program.php?catoid=7&poid=2581) **Credits:** **(4)** or
* [CS 4350 - Advanced Internet Programming](http://catalog.weber.edu/preview_program.php?catoid=7&poid=2581) **Credits:** **(4)** or
* [CS 4650 - Advanced Game Development](http://catalog.weber.edu/preview_program.php?catoid=7&poid=2581) **Credits:** **(4)** or
* [CS 4750 - Advanced Software Engineering Methods](http://catalog.weber.edu/preview_program.php?catoid=7&poid=2581) **Credits:** **(4)** or
* [CS 4790 - ASP.NET Web Programming](http://catalog.weber.edu/preview_program.php?catoid=7&poid=2581) **Credits:** **(4)**

 * Any two computer science upper division electives **(8)**.  *You may not use* [*CS 4800*](http://catalog.weber.edu/preview_program.php?catoid=7&poid=2581#tt6835) *or CS4850 or* [*CS 4890*](http://catalog.weber.edu/preview_program.php?catoid=7&poid=2581#tt4961) *for these electives.*
* Complete a minor in any academic area or a concurrent second bachelor’s degree, or have completed a first bachelor’s degree.

**Note:***Additional hours of upper division computer science courses may be taken to satisfy the University upper division requirement of 40 hours (*[*CS 4890*](http://catalog.weber.edu/preview_program.php?catoid=7&poid=2581#tt1452) *is recommended).* **Support Courses Required (7 credit hours)*** [ENGL 3100 - Professional and Technical Writing](http://catalog.weber.edu/preview_program.php?catoid=7&poid=2581) **Credits:** **(3)** or
* [NTM 3250 - Business Communication](http://catalog.weber.edu/preview_program.php?catoid=7&poid=2581) **Credits:** **(3)** or
* [ENGL 2250 CA - Creative Writing](http://catalog.weber.edu/preview_program.php?catoid=7&poid=2581) **Credits:** **(3)** or
* [PHIL 1250 HU - Critical Thinking](http://catalog.weber.edu/preview_program.php?catoid=7&poid=2581) **Credits:** **(3)**

 * [MATH 1220 - Calculus II](http://catalog.weber.edu/preview_program.php?catoid=7&poid=2581) **Credits:** **(4)**
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Related changes to course descriptions in the catalog:

**CS 4800 - Individual Projects and Research**

**Credits:** **(1-4)**
**Typically taught:**
**Fall [Full Sem]
Spring [Full Sem]
Summer [Full Sem]**

The purpose of this course is to permit Computer Science majors to develop an individual project, program, system, or research paper, with coordination and approval of a faculty mentor. The final grade and amount of credit awarded will be determined by the department, depending on the complexity of the upper division work performed. Prerequisite: [CS 2420](http://catalog.weber.edu/content.php?catoid=7&navoid=1097&print#tt5092). May be repeated 3 times up to 4 credit hours. Note: Only 4 credit hours of ~~either~~ CS 4800 or CS4850 or [CS 4890](http://catalog.weber.edu/content.php?catoid=7&navoid=1097&print#tt1406) can apply to a CS degree as an elective course, and only a maximum of 6 hours of ~~both~~ CS 4800, CS4850, and [CS 4890](http://catalog.weber.edu/content.php?catoid=7&navoid=1097&print#tt1864) may be taken to satisfy missing credits or to achieve full time academic status.

**CS 4890 - Cooperative Work Experience**

**Credits:** **(1-4)**
**Typically taught:**
**Fall [Full Sem]
Spring [Full Sem]
Summer [Full Sem]**

The purpose of this course is to permit Computer Science majors who are currently working in a computer related job or internship to receive academic credit for their work, with coordination and approval of a faculty mentor and their supervisor. The amount of upper division credit awarded will be determined by the department, depending on the nature and quantity of work performed. Prerequisite: [CS 2420](http://catalog.weber.edu/content.php?catoid=7&navoid=1097&print#tt8447). May be repeated 3 times up to 4 credit hours. Note: Only 4 credit hours of ~~either~~ CS 4800 or CS4850 or [CS 4890](http://catalog.weber.edu/content.php?catoid=7&navoid=1097&print#tt1406) can apply to a CS degree as an elective course, and only a maximum of 6 hours of ~~both~~ CS 4800, CS4850, and [CS 4890](http://catalog.weber.edu/content.php?catoid=7&navoid=1097&print#tt1864) may be taken to satisfy missing credits or to achieve full time academic status.

After the appropriate Approvals, **Email the electronic file (Microsoft Word .docx) to** bstockberger @weber.edu You may scan the Approval Page with the Signatures and email it, send a hard copy to MC 1033 through campus mail or bring to the Faculty Senate Office MA210J. Send all supporting documents pertaining to your proposal.

**INFORMATION PAGE**

Did this program change receive unanimous approval within the Department? \_Yes\_ If not, what are the major concerns raised by the opponents?

Explain any effects this program change will have on program requirements or enrollments in other departments including the Bachelor of Integrated Studies Program. In the case of similar offerings or affected programs, **you should include letters from the departments in question stating their support or opposition to the proposed program**.

No impact on other departments.

Indicate the number of credit hours for course work within the current program. (Do not include credit hours for General Education, Diversity, or other courses unless those courses fulfill requirements within the current program.) 126

**Graduate Programs only**: Describe any proposed changes in the instructional mode of delivery or course format that are program-wide in nature or that affect more than one-third of the course taught in the program (e. g. changing from in-class to online instruction). APPROVAL PAGE

for: (Program Title) Date submitted online \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

For new course proposals, excluding Experimental and Variable Title courses, the following must be completed by the Library bibliographer:

\_\_\_\_ The WSU Library has adequate information resources to support this proposal.

\_\_\_\_ Currently, the WSU Library does not have adequate information resources to support this course. However, if this proposal is approved, a Library bibliographer will work closely with departmental faculty to acquire the information resources needed. Funding for the new resources will come from the library’s budget.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ WSU Librarian/Date

**Approval Sequence**:

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Department Chair/Date (or BIS Director)

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

College Curriculum Committee/Date (Signature not needed on Experimental or Variable Title courses.)

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Career and Technical Education Director. (Needed on new or deleted courses required in a 2-year program.)

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Dean of College/Date

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| Courses required in programs leading to secondary undergraduate teacher certification must be approved by the University Council on Teacher Education before being submitted to the Curriculum Committee. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ University Council on Teacher Education/Date  |

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| Graduate course proposals must be reviewed by the University Graduate Council before being submitted to the Curriculum Committee. I have read the proposal and discussed it with the program director.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_University Graduate Council Representative/Date |

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Effective Semester\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

University Curriculum Committee/Date

Passed by Faculty Senate \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Date