The Bachelor of Science in Computer Science

Total Course Requirements for the Bachelor's Degree: 120 units

See Bachelor's Degree Requirements in the University Catalog for complete details on general degree requirements. A minimum of 40 units, including those required for the major, must be upper division.

A suggested Major Academic Plan (MAP) has been prepared to help students meet all graduation requirements within four years. You can view MAPs on the Degree MAPs page in the University Catalog or you can request a plan from your major advisor.

General Education Pathway Requirements: 48 units

See General Education in the University Catalog and the Class Schedule for the most current information on General Education Pathway Requirements and course offerings.

This major has approved GE modification(s). See below for information on how to apply these modification(s).

- CSCI 217 is an approved major course substitution for Critical Thinking (A3).
- MATH 217 is an approved major course substitution for Critical Thinking (A3).
- CSCI 551 is an approved major course substitution for Upper-Division Natural Sciences
- CSCI 301 is an approved major course substitution for Upper Division Social Sciences.
- CSCI 301 is also an approved GE Capstone substitution.

Diversity Course Requirements: 6 units

See Diversity Requirements in the University Catalog. Most courses taken to satisfy these requirements may also apply to General Education.

Literacy Requirement:

See Mathematics and Writing Requirements in the University Catalog. Writing proficiency in the major is a graduation requirement and may be demonstrated through satisfactory completion of a course in your major which has been designated as the Writing Proficiency (WP) course for the semester in which you take the course. Students who earn below a C- are required to repeat the course and earn a C- or higher to receive WP credit. See the Class Schedule for the designated WP courses for each semester. You must complete the GE Written Communication (A2) requirement before you may register for a WP course.
Requirements for enrollment in Upper Division CSCI or CINS courses:

Complete CSCI 111, CSCI 211, MATH 120, and CSCI/MATH 217 all with a grade of C or higher.

Enrollment in any upper division course that is required for the BS in Computer Science is restricted to students who have a declared major or minor that names the course as a requirement or elective.

Course Requirements for the Major: 87 units

Completion of the following courses, or their approved transfer equivalents, is required of all candidates for this degree.

Enrollment in any mathematics course requires a grade of C- or higher in all prerequisite courses or their transfer equivalents.

Lower-Division Requirements: 30 units

8.5 courses required:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>CINS 110</td>
<td>Introductory Web Programming</td>
<td>3.0</td>
<td>FS</td>
</tr>
<tr>
<td>CSCI 111</td>
<td>Programming and Algorithms I</td>
<td>4.0</td>
<td>FS</td>
</tr>
<tr>
<td>CSCI 211</td>
<td>Programming and Algorithms II</td>
<td>4.0</td>
<td>FS</td>
</tr>
<tr>
<td>EECE 237</td>
<td>Embedded Systems Development</td>
<td>3.0</td>
<td>FA</td>
</tr>
<tr>
<td>MATH 120</td>
<td>Analytic Geometry and Calculus</td>
<td>4.0</td>
<td>FS GE</td>
</tr>
<tr>
<td>MATH 121</td>
<td>Analytic Geometry and Calculus</td>
<td>4.0</td>
<td>FS</td>
</tr>
</tbody>
</table>

Prerequisites: Completion of ELM requirement; both MATH 118 and MATH 119 (or college equivalent); first-year freshmen who successfully completed trigonometry and precalculus in high school can meet this prerequisite by achieving a score that meets department guidelines on a department administered calculus readiness exam.

1 course selected from:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSCI 217</td>
<td>Discrete Mathematics</td>
<td>3.0</td>
<td>INQ</td>
</tr>
</tbody>
</table>

Prerequisites: Completion of ELM, CSCI 111 with a grade of C or higher, MATH 119 (or equivalent).
MATH 217  Discrete Mathematics  3.0  FS
Prerequisites: Completion of ELM, CSCI 111 with a grade of C or higher, MATH 119 (or equivalent).

2 courses selected from:

CHEM 107  General Chemistry for Applied Sciences  4.0  FS  GE
CHEM 108  Organic Chemistry for Applied Sciences  4.0  FS  GE
CHEM 111  General Chemistry  4.0  FS  GE
CHEM 112  General Chemistry  4.0  FS
Prerequisite: CHEM 111 with a grade of C- or better

PHYS 204A  Physics for Students of Science and Engineering: Mechanics  4.0  FS  GE
Prerequisites: High school physics or faculty permission. Concurrent enrollment in or prior completion of MATH 121 (second semester of calculus) or equivalent.

PHYS 204B  Physics for Students of Science and Engineering: Electricity and Magnetism  4.0  FS
Prerequisites: MATH 121, PHYS 204A with a grade of C- or higher.

Upper-Division Requirements: 54 57 units

15 courses required: (49 Units)

CINS 370  Introduction to Databases  3.0  FS
Prerequisite: CSCI 211 with a grade of C or higher.

CINS 448  Computer Security  3.0  FS
Prerequisites: CSCI 446 with a grade of C or higher.

CINS 465  Web Programming Fundamentals  3.0  FS
Prerequisites: CINS 110, CINS 370 both with a grade of C or higher.

CSCI 301  Computer's Impact on Society  3.0  FS  WP
Prerequisites: Completion of GE Written Communication (A2) requirement; Junior standing.

CSCI 311  Algorithms and Data Structures  4.0  FS
Prerequisites: CSCI 211, CSCI 217 or MATH 217, all with a grade of C or higher.

CSCI 340  Operating Systems  4.0  FS
Prerequisites: CSCI 311, EECE 320, both grade of C or higher.

CSCI 430  Software Engineering  3.0  FS
Prerequisite: CSCI 311 with a grade of C or higher.

CSCI 446  Introduction to Computer Networks and Network Management  3.0  FS
Prerequisites: CSCI 111 and either CINS 220 or EECE 237 all with a C or higher.
CSCI 490 Computer Science Capstone 3.0 FS
Prerequisite: CSCI 311 with a grade of C or higher, Senior standing.
CSCI 515 Compiler Design 3.0 FS
Prerequisite: CSCI 311 with a grade of C or higher.
CSCI 550 Theory of Computing 3.0 FS
Prerequisites: CSCI 217 or MATH 217, CSCI 311, all with a grade of C or better.
CSCI 551 Numerical Methods and Parallel Programming 4.0 FS
Prerequisites: CSCI 311 with a grade of C or higher, MATH 109 or MATH 121.
CSCI 580 Artificial Intelligence 3.0 FS
Prerequisite: CSCI 311 with a grade of C or higher.
EECE 320 System Architecture and Performance 3.0 FS
Prerequisites: CSCI 217 or MATH 217 or EECE 144, EECE 237.
MATH 314 Probability and Statistics for Science and Technology 4.0 FS
Prerequisites: MATH 121.

58 units selected from:

Select upper-division Computer Science (CSCI) or Computer Information Systems (CINS) courses, or EECE 555, and/or upper-division Math courses that meet a requirement for the Minor in Mathematics. A maximum of 3 units may be taken for credit/no credit grading.

Additional Computer Science Graduation Requirement:

Graduating seniors must complete an exit exam as a requirement for graduation. Passing the exam is not required for the degree; the scores will be used for program assessment. Consult the department office for examination details.

Grading Requirement:

All courses taken to fulfill major course requirements must be taken for a letter grade except those courses specified by the department as Credit/No Credit grading only.

A grade of C or higher is required in all Computer Science (CSCI), Computer Information Systems (CINS), Electrical/Electronic (EECE), Business Information Systems (BSIS), or Management Information Systems (MINS) courses used for the major.

Advising Requirement:

Advising is mandatory for all majors in this degree program. Consult your undergraduate advisor for specific information.
Honors in the Major:

Honors in the Major is a program of independent work in your major. It requires 6 units of honors course work completed over two semesters.

The Honors in the Major program allows you to work closely with a faculty mentor in your area of interest on an original performance or research project. This year-long collaboration allows you to work in your field at a professional level and culminates in a public presentation of your work. Students sometimes take their projects beyond the University for submission in professional journals, presentation at conferences, or academic competition. Such experience is valuable for graduate school and professional life. Your honors work will be recognized at your graduation, on your permanent transcripts, and on your diploma. It is often accompanied by letters of commendation from your mentor in the department or the department chair.

Some common features of Honors in the Major program are:

1. You must take 6 units of Honors in the Major course work. All 6 units are honors classes (marked by a suffix of H), and at least 3 of these units are independent study (399H, 499H, 599H) as specified by your department. You must complete each class with a minimum grade of B.
2. You must have completed 9 units of upper-division course work or 21 overall units in your major before you can be admitted to Honors in the Major. Check the requirements for your major carefully, as there may be specific courses that must be included in these units.
3. Your cumulative GPA should be at least 3.5 or within the top 5% of majors in your department.
4. Your GPA in your major should be at least 3.5 or within the top 5% of majors in your department.
5. Most students apply for or are invited to participate in Honors in the Major during the second semester of their junior year. Then they complete the 6 units of course work over the two semesters of their senior year.
6. Your honors work culminates with a public presentation of your honors project.

While Honors in the Major is part of the Honors Program, each department administers its own program. Please contact your major department or major advisor to apply.

Honors in Computer Science

In addition to the common requirements for the Honors in the Major program given above, the Honors in Computer Science program includes the following:

1. You must be recommended by a faculty member.
2. Students who are admitted to the department's Honors in the Major program must complete 3 units of CINS 465H, CINS 548H, CSCI 511H, CSCI 515H, CSCI 540H, CSCI 550H, CSCI 551H, CSCI 566H, CSCI 567H, CSCI 568H, or CSCI 580H, with a minimum grade of B. Unless other arrangements are made, the professor instructing the
course you take becomes your faculty mentor. It is during this time that you must define a research problem or performance area and develop an Honors Research Project/Thesis proposal in preparation for work in CSCI 499H. You must also maintain a minimum GPA of 3.0 in your senior year.

3. Each Honors in the Major class requires completion of the course plus an additional Honors project and culminates with a public presentation of your Honors project.

**Blended BS + MS (BMS) in Computer Science**

Qualified students majoring in Computer Science may apply for the Blended BS + MS (BMS) program in Computer Science, allowing them to earn credit towards the MS at the same time they are completing the BS. See the catalog section on the BMS in Computer Science following the description of the MS in Computer Science.
Minor Change to an Undergraduate Program

Program Name: BS in Computer Science

Complete only if applicable
Program named above is:
__ Option __ within ________________________________
(degree program name)

__ Advising Pattern __ within ________________________________
(option name)

within ________________________________
(degree program name)

__ Minor __

__ Certificate __

__ Changes being made affect a subject matter preparation or credential program.

Brief rationale for change:
The addition of a set of pre-major requirements will help the department support and guide students to select a major in which they will be likely to succeed, will reduce DWF rates, and increase retention and completion statistics in the program.

Does the proposed change enhance or support the Diversity Action Plan (see definition & Task 3.1)? No
If yes, please explain.

Required Signatures

The Department of Computer Science has reviewed and approves this program change

Chair, Department Curriculum Committee

Department Chair

The College of ECC has reviewed and approves this program change

Chair, College Curriculum Committee

College Dean

Send signature page with proposal attached to Curriculum Services at Undergraduate Education, zip 128
Curriculum Technical Review Completed

Date
The Bachelor of Science in Computer Science

Total Course Requirements for the Bachelor's Degree: 120 units

See Bachelor's Degree Requirements in the University Catalog for complete details on general degree requirements. A minimum of 40 units, including those required for the major, must be upper division.

A suggested Major Academic Plan (MAP) has been prepared to help students meet all graduation requirements within four years. You can view MAPs on the Degree MAPs page in the University Catalog or you can request a plan from your major advisor.

General Education Pathway Requirements: 48 units

See General Education in the University Catalog and the Class Schedule for the most current information on General Education Pathway Requirements and course offerings.

This major has approved GE modification(s). See below for information on how to apply these modification(s).

- CSCI 217 is an approved major course substitution for Critical Thinking (A3).
- MATH 217 is an approved major course substitution for Critical Thinking (A3).
- CSCI 551 is an approved major course substitution for Upper-Division Natural Sciences
- CSCI 301 is an approved major course substitution for Upper Division Social Sciences.
- CSCI 301 is also an approved GE Capstone substitution.

Diversity Course Requirements: 6 units

See Diversity Requirements in the University Catalog. Most courses taken to satisfy these requirements may also apply to General Education.

Literacy Requirement:

See Mathematics and Writing Requirements in the University Catalog. Writing proficiency in the major is a graduation requirement and may be demonstrated through satisfactory completion of a course in your major which has been designated as the Writing Proficiency (WP) course for the semester in which you take the course. Students who earn below a C- are required to repeat the course and earn a C- or higher to receive WP credit. See the Class Schedule for the designated WP courses for each semester. You must complete the GE Written Communication (A2) requirement before you may register for a WP course.

* insert here - see below

Course Requirements for the Major: 87 units

Completion of the following courses, or their approved transfer equivalents, is required of all candidates for this degree.

Enrollment in any mathematics course requires a grade of C- or higher in all prerequisite courses or their transfer equivalents.

Lower-Division Requirements: 33 units

8 courses required:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
<th>Term</th>
</tr>
</thead>
<tbody>
<tr>
<td>CINS 110</td>
<td>Introductory Web Programming</td>
<td>3.0</td>
<td>FS</td>
</tr>
<tr>
<td>CSCI 111</td>
<td>Programming and Algorithms I</td>
<td>4.0</td>
<td>FS</td>
</tr>
<tr>
<td></td>
<td>Prerequisite: Completion of ELM requirement.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CSCI 211</td>
<td>Programming and Algorithms II</td>
<td>4.0</td>
<td>FS</td>
</tr>
<tr>
<td></td>
<td>Prerequisite: CSCI 111 with a grade of C or higher.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>EECE 237</td>
<td>Embedded Systems Development</td>
<td>3.0</td>
<td>FA</td>
</tr>
<tr>
<td></td>
<td>Prerequisite: CSCI 111.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
MATH 120 Analytic Geometry and Calculus 4.0 FS GE

Prerequisites: Completion of ELM requirement; both MATH 118 and MATH 119 (or college equivalent); first-year freshmen who successfully completed trigonometry and precalculus in high school can meet this prerequisite by achieving a score that meets department guidelines on a department administered calculus readiness exam.

MATH 121 Analytic Geometry and Calculus 4.0 FS

Prerequisites: MATH 120.

PHYS 204A Physics for Students of Science and Engineering: Mechanics 4.0 FS GE

Prerequisites: High school physics or faculty permission. Concurrent enrollment in or prior completion of MATH 121 (second semester of calculus) or equivalent.

PHYS 204B Physics for Students of Science and Engineering: Electricity and Magnetism 4.0 FS

Prerequisites: MATH 121, PHYS 204A with a grade of C- or higher.

1 course selected from:

CSCI 217 Discrete Mathematics 3.0 INQ

Prerequisites: Completion of ELM, CSCI 111 with a grade of C or higher, MATH 119 (or equivalent).

MATH 217 Discrete Mathematics 3.0 FS

Prerequisites: Completion of ELM, CSCI 111 with a grade of C or higher, MATH 119 (or equivalent).

Upper-Division Requirements: 54 units

15 courses required:

CINS 370 Introduction to Databases 3.0 FS

Prerequisite: CSCI 211 with a grade of C or higher.

CINS 448 Computer Security 3.0 FS

Prerequisites: CSCI 446 with a grade of C or higher.

CINS 465 Web Programming Fundamentals 3.0 FS

Prerequisites: CINS 110, CINS 370 both with a grade of C or higher.

CSCI 301 Computer's Impact on Society 3.0 FS WP

Prerequisites: Completion of GE Written Communication (A2) requirement; Junior standing.

CSCI 311 Algorithms and Data Structures 4.0 FS

Prerequisites: CSCI 211, CSCI 217 or MATH 217, all with a grade of C or higher.

CSCI 340 Operating Systems 4.0 FS

Prerequisites: CSCI 311, EECE 320, both grade of C or higher.

CSCI 430 Software Engineering 3.0 FS

Prerequisite: CSCI 311 with a grade of C or higher.

CSCI 446 Introduction to Computer Networks and Network Management 3.0 FS

Prerequisites: CSCI 111 and either CINS 220 or EECE 237 all with a C or higher.

CSCI 490 Computer Science Capstone 3.0 FS

Prerequisite: CSCI 311 with a grade of C or higher, Senior standing.

CSCI 515 Compiler Design 3.0 FS

Prerequisite: CSCI 311 with a grade of C or higher.

CSCI 550 Theory of Computing 3.0 FS

Prerequisites: CSCI 217 or MATH 217, CSCI 311, all with a grade of C or better.

CSCI 551 Numerical Methods and Parallel Programming 4.0 FS

Prerequisites: CSCI 311 with a grade of C or higher, MATH 109 or MATH 121.
CSCI 580  Artificial Intelligence 3.0  FS
Prerequisite: CSCI 311 with a grade of C or higher.

EECE 320  System Architecture and Performance 3.0  FS
Prerequisites: CSCI 217 or MATH 217 or EECE 144, EECE 237.

MATH 314  Probability and Statistics for Science and Technology 4.0  FS
Prerequisites: MATH 121.

5 units selected from:
Select upper-division Computer Science (CSCI) or Computer Information Systems (CINS) courses, or EECE 555, and/or upper-division Math courses that meet a requirement for the Minor in Mathematics. A maximum of 3 units may be taken for credit/no credit grading.

Additional Computer Science Graduation Requirement:
Graduating seniors must complete an exit exam as a requirement for graduation. Passing the exam is not required for the degree; the scores will be used for program assessment. Consult the department office for examination details.

Grading Requirement:
All courses taken to fulfill major course requirements must be taken for a letter grade except those courses specified by the department as Credit/No Credit grading only.

A grade of C or higher is required in all Computer Science (CSCI), Computer Information Systems (CINS), Electrical/Electronic (EECE), Business Information Systems (BSIS), or Management Information Systems (MINS) courses used for the major.

Advising Requirement:
Advising is mandatory for all majors in this degree program. Consult your undergraduate advisor for specific information.

Honors in the Major:

Honors in the Major is a program of independent work in your major. It requires 6 units of honors course work completed over two semesters.

The Honors in the Major program allows you to work closely with a faculty mentor in your area of interest on an original performance or research project. This year-long collaboration allows you to work in your field at a professional level and culminates in a public presentation of your work. Students sometimes take their projects beyond the University for submission in professional journals, presentation at conferences, or academic competition. Such experience is valuable for graduate school and professional life. Your honors work will be recognized at your graduation, on your permanent transcripts, and on your diploma. It is often accompanied by letters of commendation from your mentor in the department or the department chair.

Some common features of Honors in the Major program are:

1. You must take 6 units of Honors in the Major course work. All 6 units are honors classes (marked by a suffix of H), and at least 3 of these units are independent study (399H, 499H, 599H) as specified by your department. You must complete each class with a minimum grade of B.
2. You must have completed 9 units of upper-division course work or 21 overall units in your major before you can be admitted to Honors in the Major. Check the requirements for your major carefully, as there may be specific courses that must be included in these units.
3. Your cumulative GPA should be at least 3.5 or within the top 5% of majors in your department.
4. Your GPA in your major should be at least 3.5 or within the top 5% of majors in your department.
5. Most students apply for or are invited to participate in Honors in the Major during the second semester of their junior year. Then they complete the 6 units of course work over the two semesters of their senior year.
6. Your honors work culminates with a public presentation of your honors project.

While Honors in the Major is part of the Honors Program, each department administers its own program. Please contact your major department or major advisor to apply.
Honors in Computer Science

In addition to the common requirements for the Honors in the Major program given above, the Honors in Computer Science program includes the following:

1. You must be recommended by a faculty member.
2. Students who are admitted to the department's Honors in the Major program must complete 3 units of CINS 465H, CINS 548H, CSCI 511H, CSCI 515H, CSCI 540H, CSCI 550H, CSCI 551H, CSCI 566H, CSCI 567H, CSCI 568H, or CSCI 580H, with a minimum grade of B. Unless other arrangements are made, the professor instructing the course you take becomes your faculty mentor. It is during this time that you must define a research problem or performance area and develop an Honors Research Project/Thesis proposal in preparation for work in CSCI 499H. You must also maintain a minimum GPA of 3.0 in your senior year.
3. Each Honors in the Major class requires completion of the course plus an additional Honors project and culminates with a public presentation of your Honors project.

Blended BS + MS (BMS) in Computer Science

Qualified students majoring in Computer Science may apply for the Blended BS + MS (BMS) program in Computer Science, allowing them to earn credit towards the MS at the same time they are completing the BS. See the catalog section on the BMS in Computer Science following the description of the MS in Computer Science.

* Requirements for Declaring the CSCI Major:
  1) complete CSCI 111, CSCI 211, MATH 120 and CSCI/MATH 217, all with a grade of C or higher
  2) the grade average over all attempts of the four courses listed above must be 2.0 or higher
Once these requirements are met students can declare the Major in Computer Science.
Students who do not meet these requirements will not be admitted to the CSCI major.

Requirements for Enrollment in Upper Division CSCI or CINS courses:
Enrollment in any upper-division course that is required for the BS in Computer Science is restricted to students who have a declared major or minor that names the course as a core requirement or as a listed elective.
# 2018-19 Computer Science MAJOR ACADEMIC PLAN (MAP)

**Major Units: 87**

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Second Semester</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 120 Analytic Geometry and Calculus (GE A4) [*C-]</td>
<td>4  MATH 121 Analytic Geometry and Calculus [*C-]</td>
<td>4  [*GC/USD/WI] Consider selecting a course that will allow you to double count within General Education and the USD/GC Diversity requirement and/or the Writing Intensive course requirement.</td>
</tr>
<tr>
<td>POLS 155 or HIST 130</td>
<td>3  HIST 130 or POLS 155</td>
<td>3</td>
</tr>
<tr>
<td>GE Area A2 [*C-]</td>
<td>3  MATH/CSCI 217 Discrete Math (GE A3) [*C]</td>
<td>3</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>14  <strong>TOTAL</strong></td>
<td>14</td>
</tr>
</tbody>
</table>

| Third Semester                      | Fourth Semester                      | |  |
|-------------------------------------|--------------------------------------| |  |
| Major Science Selection [* see below, B1 or B2] | 4  Major Science Selection [* see below, B1 or B2] | 4  [*C-] C- or Better is required.  |
| GE Area A1 [\*C-]                  | 3  GE Area D2 [\*GC/USD/WI]          | 3  |  |
| GE Area D1 [\*GC/USD/WI]           | 3  GE Area E [\*GC/USD/WI]           | 3  |  |
| GE Area C1 [\*GC/USD/WI]           | 3  GE Area C2 [\*GC/USD/WI]           | 3  |  |
| EECE 237 Embedded Systems Development [\*C] | 3  GE Area B1, B2 or Elective [** see below] | 3  |  |
| **TOTAL**                          | 16  **TOTAL**                        | 16  |  |

| Fifth Semester                      | Sixth Semester                       | |  |
|-------------------------------------|--------------------------------------| |  |
| CSCI 301 [\*C](WP)(GE Capstone) [*UD-D GE] | 3  CSCI 446 Introduction to Computer Networks [\*C] | 3  |  |
| CSCI 311 Algorithms and Data Structures [\*C] | 4  CSCI 340 Operating Systems [\*C] | 4  |  |
| CINS 370 Introduction to Databases [\*C] | 3  CSCI 515 Compiler Design [\*C] | 3  |  |
| EECE 320 System Architecture and Performance [\*C] | 3  MATH 314 Prob & Stat for Science and Tech | 4  |  |
| GE UD Pathway (UD-C) [\*GC/USD/WI] | 3  |  |  |
| **TOTAL**                          | 16  **TOTAL**                        | 16  |  |

| Seventh Semester                    | Eighth Semester                      | |  |
|-------------------------------------|--------------------------------------| |  |
| CSCI 430 Software Engineering [\*C] | 3  CSCI 490 CSCI Capstone [\*C] | 3  |  |
| CSCI 580 Artificial Intelligence [\*C] | 3  CINS 448 Security [\*C] | 3  |  |
| **TOTAL**                          | 15  **TOTAL**                        | 15  |  |

* choose from PHYS 204A (B1), PHYS 204B, CHEM 111 (B1), CHEM 112, BIOL 151 (B2), BIOL 152 or BIOL 153

It is recommended that you meet with your major advisor early in your academic career and every semester.

Complete a minimum of 4 Writing Intensive (WI) courses—one will be met by your Written Communication Course and one by your Capstone Course; select 2 additional WI courses.

**120 units required for Degree**
Proposed change to science requirement for the BS in Computer Science

Day, Jonathan <JDay@csuchico.edu>  
Fri, Mar 3, 2017 at 10:01 AM

To: "Challinger, Judith" <jchallinger@csuchico.edu>  
Cc: "Stapleton, Melody" <MJStapleton@csuchico.edu>, "Berglund-Smith, Michelle" <MBerglund-Smith@csuchico.edu>, "Gray, Nicol" <NSGray@csuchico.edu>

Yes I agree.

Jonathan R. Day, PhD
Professor of Biological Sciences and Chair
College of Natural Sciences,
California State University, Chico

From: jchallinger@gmail.com [mailto:jchallinger@gmail.com] On Behalf Of Judy Challinger
Sent: Thursday, March 02, 2017 8:38 PM
To: Day, Jonathan <JDay@csuchico.edu>
Cc: Stapleton, Melody <MJStapleton@csuchico.edu>; Berglund-Smith, Michelle <MBerglund-Smith@csuchico.edu>; Gray, Nicol <NSGray@csuchico.edu>
Subject: Re: Proposed change to science requirement for the BS in Computer Science

Hi Jonathan, Just checking in. Do we have your agreement on our proposed change to our science requirements as listed below? We need an email for the proposal. Thank you!

Judy Challinger, Ph.D.
On Mon, Feb 20, 2017 at 1:47 PM, Judy Challinger <jchallinger@csuchico.edu> wrote:

Hi all, We propose to make the following change to the BS in Computer Science. It currently requires PHYS 204A and PHYS 204B and we would like to expand the options as follows. Please let us know if your departments would have any issues with this change. Thank you!

Judy Challinger
Curriculum Committee Chair
Computer Science Department

Take any two of the following courses:

PHYS 204A Physics for Students of Science and Engineering: Mechanics

Prerequisites: High school physics or faculty permission. Concurrent enrollment in or prior completion of MATH 121 (second semester of calculus) or equivalent.

(advanced course substitution for GE B1)

PHYS 204B Physics for Students of Science and Engineering: Electricity and Magnetism

Prerequisites: MATH 121, PHYS 204A with a grade of C- or higher.

CHEM 111 General Chemistry

Prerequisites: Completion of ELM requirement; second-year high school algebra; one year high school chemistry. (One year of high school physics and one year of high school mathematics past Algebra II are recommended.)

(advanced course substitution for GE B1)

CHEM 112 General Chemistry
Prerequisites: CHEM 111 with a grade of C- or better.

**BIOL 151 Principles of Cellular and Molecular Biology**

Prerequisites: Recommend CHEM 111 or concurrent enrollment.

(advanced course substitution for GE B2)

**BIOL 152 Principles of Ecological, Evolutionary, and Organismal Biology**

Prerequisites: BIOL 151 or faculty permission; recommend CHEM 112 or concurrent enrollment.

(advanced course substitution for GE B2)

**BIOL 153 Principles of Physiology and Development**

Prerequisites: BIOL 151; CHEM 112 or concurrent enrollment recommended.

(advanced course substitution for GE B2)

Judy Challinger, Ph.D.

www.ecst.csuchico.edu/~judyc
Proposed change to science requirement for the BS in Computer Science

Miller, Randy <RMMiller@csuchico.edu>  
Mon, Feb 20, 2017 at 8:30 PM  
To: "Zou, Xueli" <XZou@csuchico.edu>, "Day, Jonathan" <JDay@csuchico.edu>, "Challinger, Judith" <jchallinger@csuchico.edu>  
Cc: "Stapleton, Melody" <MJStapleton@csuchico.edu>, "Berglund-Smith, Michelle" <MBerglund-Smith@csuchico.edu>, "Gray, Nicol" <NSGray@csuchico.edu>

Hi Judy,

I always assumed that anyone in Computer Science or Computer Engineering would be well served by a comprehensive course of study in PHYS, but I can see where opportunities to explore topics in CHEM or BIOL might also be valuable, especially with the tremendous advances in bioinformatics and computational chemistry (my own area of research). CHEM would not have a problem with CSCI majors taking CHEM 111 and 112 or some other course on the list.

Randy

From: jchallinger@gmail.com <jchallinger@gmail.com> on behalf of Judy Challinger <jchallinger@csuchico.edu>  
Sent: Monday, February 20, 2017 1:47:33 PM  
To: Miller, Randy; Zou, Xueli; Day, Jonathan  
Cc: Stapleton, Melody; Berglund-Smith, Michelle; Gray, Nicol  
Subject: Proposed change to science requirement for the BS in Computer Science

Hi all, We propose to make the following change to the BS in Computer Science. It currently requires PHYS 204A and PHYS 204B and we would like to expand the options as follows. Please let us know if your departments would have any issues with this change. Thank you!

Judy Challinger  
Curriculum Committee Chair  
Computer Science Department

Take any two of the following courses:

https://mail.google.com/mail/ca/u/0?ui=2&ik=d49e6dc6d5&view=pt&q=change%20to%20science&qs=true&search=query&msg=...
PHYS 204A Physics for Students of Science and Engineering: Mechanics

Prerequisites: High school physics or faculty permission. Concurrent enrollment in or prior completion of MATH 121 (second semester of calculus) or equivalent.

(advanced course substitution for GE B1)

PHYS 204B Physics for Students of Science and Engineering: Electricity and Magnetism

Prerequisites: MATH 121, PHYS 204A with a grade of C- or higher.

CHEM 111 General Chemistry

Prerequisites: Completion of ELM requirement; second-year high school algebra; one year high school chemistry. (One year of high school physics and one year of high school mathematics past Algebra II are recommended.)

(advanced course substitution for GE B1)

CHEM 112 General Chemistry

Prerequisites: CHEM 111 with a grade of C- or better.

BIOL 151 Principles of Cellular and Molecular Biology

Prerequisites: Recommend CHEM 111 or concurrent enrollment.

(advanced course substitution for GE B2)

BIOL 152 Principles of Ecological, Evolutionary, and Organismal Biology

Prerequisites: BIOL 151 or faculty permission; recommend CHEM 112 or concurrent enrollment.

(advanced course substitution for GE B2)

BIOL 153 Principles of Physiology and Development

Prerequisites: BIOL 151; CHEM 112 or concurrent enrollment recommended.

(advanced course substitution for GE B2)

Judy Challinger, Ph.D.
www.ecst.csuchico.edu/~judyc
Proposed change to science requirement for the BS in Computer Science

Zou, Xueli <XZou@csuchico.edu>  Thu, Mar 2, 2017 at 9:16 PM
To: "Challinger, Judith" <jchallinger@csuchico.edu>
Cc: "Stapleton, Melody" <MJStapleton@csuchico.edu>, "Berglund-Smith, Michelle" <MBerglund-Smith@csuchico.edu>, "Gray, Nicol" <NSGray@csuchico.edu>, "Zou, Xueli" <XZou@csuchico.edu>

Hi Judy,

Sorry for my slow reply. Melody and I had a nice conservation. It’s ok with PHYS for your changes, as which are in line with the ABET standards.

Just as I shared with Melody, PHYS is redesigning our 204A/B/C courses, which are in relatively smaller-sized classes (48 students in lecture and 24 students in lab), more aggressively addressing the ABET standards, and creating actively learning environments with implementing Learning Assistants (LAs). In addition, some PHYS professors are experimenting to have computational component (using Python) in 204A/B/C courses, which we think is interesting for computer science students. Anyway, it would be great and appreciated if your Dept. continuously encourages your majors to take 204A and B courses, although they are not required any more.…

Many thanks for giving us heads-up.

******************************************************************************

Xueli “Suelee” Zou, Ph.D.
Chair and Professor
Department of Physics
California State University, Chico
xzou@csuchico.edu
(530) 898-5584

******************************************************************************
Hi Xueli, Do we have your agreement on our proposed change to our science requirements as listed below? I never heard what came out of your meeting with Melody, and we need an email for the proposed change anyway. Thank you!

Judy Challinger, Ph.D.

www.ecst.csuchico.edu/~judyc

On Mon, Feb 20, 2017 at 1:47 PM, Judy Challinger <jchallinger@csuchico.edu> wrote:

Hi all, We propose to make the following change to the BS in Computer Science. It currently requires PHYS 204A and PHYS 204B and we would like to expand the options as follows. Please let us know if your departments would have any issues with this change. Thank you!

Judy Challinger

Curriculum Committee Chair

Computer Science Department

Take any two of the following courses:

PHYS 204A Physics for Students of Science and Engineering: Mechanics

Prerequisites: High school physics or faculty permission. Concurrent enrollment in or prior completion of MATH 121 (second semester of calculus) or equivalent.
(advanced course substitution for GE B1)

**PHYS 204B Physics for Students of Science and Engineering: Electricity and Magnetism**

Prerequisites: MATH 121, PHYS 204A with a grade of C- or higher.

**CHEM 111 General Chemistry**

Prerequisites: Completion of ELM requirement; second-year high school algebra; one year high school chemistry. (One year of high school physics and one year of high school mathematics past Algebra II are recommended.)

(advanced course substitution for GE B1)

**CHEM 112 General Chemistry**

Prerequisites: CHEM 111 with a grade of C- or better.

**BIOL 151 Principles of Cellular and Molecular Biology**

Prerequisites: Recommend CHEM 111 or concurrent enrollment.

(advanced course substitution for GE B2)

**BIOL 152 Principles of Ecological, Evolutionary, and Organismal Biology**

Prerequisites: BIOL 151 or faculty permission; recommend CHEM 112 or concurrent enrollment.

(advanced course substitution for GE B2)

**BIOL 153 Principles of Physiology and Development**

Prerequisites: BIOL 151; CHEM 112 or concurrent enrollment recommended.

(advanced course substitution for GE B2)

Judy Challinger, Ph.D.

www.ecst.csuchico.edu/~judyc
Minor Change to an Undergraduate Program

**Program Name:** BS in Computer Science

Complete only if applicable
Program named above is:

Option within ____________________________
(degree program name)

Advising Pattern within ____________________________
(option name)

within ____________________________
(degree program name)

Minor

Certificate

Changes being made affect a subject matter preparation or credential program.

**Brief rationale for change:**
CINS 110, which was recently added as a requirement, has proven to be problematic in terms of the sequencing of courses. We have decided to remove the requirement and move the content back to an upper-division course where it used to be. The change to the science requirement in the major will give students more choices while still meeting the ABET requirements for accreditation.

Does the proposed change enhance or support the Diversity Action Plan (see definition & Task 3.1)?  **No**

If yes, please explain.

**Required Signatures**

The Department of Computer Science has reviewed and approves this program change

Chair, Department Curriculum Committee  

Department Chair  

The College of  

ECC has reviewed and approves this program change

Chair, College Curriculum Committee  

College Dean  

Send signature page with proposal attached to Curriculum Services at Undergraduate Education, zip 128

Curriculum Technical Review Completed
The Bachelor of Science in Computer Science

Total Course Requirements for the Bachelor's Degree: 120 units

See Bachelor's Degree Requirements in the University Catalog for complete details on general degree requirements. A minimum of 40 units, including those required for the major, must be upper division.

A suggested Major Academic Plan (MAP) has been prepared to help students meet all graduation requirements within four years. You can view MAPs on the Degree MAPs page in the University Catalog or you can request a plan from your major advisor.

General Education Pathway Requirements: 48 units

See General Education in the University Catalog and the Class Schedule for the most current information on General Education Pathway Requirements and course offerings.

This major has approved GE modification(s). See below for information on how to apply these modification(s).
- CSCI 217 is an approved major course substitution for Critical Thinking (A3).
- MATH 217 is an approved major course substitution for Critical Thinking (A3).
- CSCI 551 is an approved major course substitution for Upper-Division Natural Sciences
- CSCI 301 is an approved major course substitution for Upper Division Social Sciences.
- CSCI 301 is also an approved GE Capstone substitution.

Diversity Course Requirements: 6 units

See Diversity Requirements in the University Catalog. Most courses taken to satisfy these requirements may also apply to General Education.

Literacy Requirement:

See Mathematics and Writing Requirements in the University Catalog. Writing proficiency in the major is a graduation requirement and may be demonstrated through satisfactory completion of a course in your major which has been designated as the Writing Proficiency (WP) course for the semester in which you take the course. Students who earn below a C- are required to repeat the course and earn a C- or higher to receive WP credit. See the Class Schedule for the designated WP courses for each semester. You must complete the GE Written Communication (A2) requirement before you may register for a WP course.

Course Requirements for the Major: 87 units

Completion of the following courses, or their approved transfer equivalents, is required of all candidates for this degree.

Enrollment in any mathematics course requires a grade of C- or higher in all prerequisite courses or their transfer equivalents.

Lower-Division Requirements: 33 units

- 6-courses required:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>CINS 110</td>
<td>Introductory Web Programming</td>
<td>3.0</td>
<td>FS</td>
</tr>
<tr>
<td>CSCI 111</td>
<td>Programming and Algorithms I</td>
<td>4.0</td>
<td>FS</td>
</tr>
<tr>
<td></td>
<td><strong>Prerequisite: Completion of ELM requirement.</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CSCI 211</td>
<td>Programming and Algorithms II</td>
<td>4.0</td>
<td>FS</td>
</tr>
<tr>
<td></td>
<td><strong>Prerequisite: CSCI 111 with a grade of C or higher.</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EECE 237</td>
<td>Embedded Systems Development</td>
<td>3.0</td>
<td>FA</td>
</tr>
<tr>
<td></td>
<td><strong>Prerequisite: CSCI 111.</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
MATH 120 Analytic Geometry and Calculus 4.0 FS GE
Prerequisites: Completion of ELM requirement; both MATH 118 and MATH 119 (or college equivalent); first-year freshmen who successfully completed trigonometry and precalculus in high school can meet this prerequisite by achieving a score that meets department guidelines on a department administered calculus readiness exam.

MATH 121 Analytic Geometry and Calculus 4.0 FS
Prerequisites: MATH 120.

** insert here - see below - 2 courses selected from:

PHYS 204A Physics for Students of Science and Engineering: Mechanics 4.0 FS GE
Prerequisites: High school physics or faculty permission. Concurrent enrollment in or prior completion of MATH 121 (second semester of calculus) or equivalent.

PHYS 204B Physics for Students of Science and Engineering: Electricity and Magnetism 4.0 FS
Prerequisites: MATH 121, PHYS 204A with a grade of C- or higher.

1 course selected from:

CSCI 217 Discrete Mathematics 3.0 INQ
Prerequisites: Completion of ELM, CSCI 111 with a grade of C or higher, MATH 119 (or equivalent).

MATH 217 Discrete Mathematics 3.0 FS
Prerequisites: Completion of ELM, CSCI 111 with a grade of C or higher, MATH 119 (or equivalent).

Upper-Division Requirements: 54 units

15 courses required:

CINS 370 Introduction to Databases 3.0 FS
Prerequisite: CSCI 211 with a grade of C or higher.

CINS 448 Computer Security 3.0 FS
Prerequisites: CSCI 446 with a grade of C or higher.

CINS 465 Web Programming Fundamentals 3.0 FS
Prerequisites: CINS 110, CINS 370 both with a grade of C or higher. CINS 370 with a grade of C or higher.

CSCI 301 Computer's Impact on Society 3.0 FS WP
Prerequisites: Completion of GE Written Communication (A2) requirement; Junior standing.

CSCI 311 Algorithms and Data Structures 4.0 FS
Prerequisites: CSCI 211, CSCI 217 or MATH 217, all with a grade of C or higher.

CSCI 340 Operating Systems 4.0 FS
Prerequisites: CSCI 311, EECE 320, both grade of C or higher.

CSCI 430 Software Engineering 3.0 FS
Prerequisite: CSCI 311 with a grade of C or higher.

CSCI 446 Introduction to Computer Networks and Network Management 3.0 FS
Prerequisites: CSCI 111 and either CINS 220 or EECE 237 all with a grade of C or higher.

CSCI 490 Computer Science Capstone 3.0 FS
Prerequisite: CSCI 311 with a grade of C or higher, Senior standing.

CSCI 515 Compiler Design 3.0 FS
Prerequisite: CSCI 311 with a grade of C or higher.

CSCI 550 Theory of Computing 3.0 FS
Prerequisites: CSCI 217 or MATH 217, CSCI 311, all with a grade of C or better.

CSCI 551 Numerical Methods and Parallel Programming 4.0 FS
Prerequisites: CSCI 311 with a grade of C or higher, MATH 109 or MATH 121.
CSCI 580  Artificial Intelligence  3.0  FS

Prerequisite: CSCI 311 with a grade of C or higher.

EECE 320  System Architecture and Performance  3.0  FS

Prerequisites: CSCI 217 or MATH 217 or EECE 144, EECE 237.

MATH 314  Probability and Statistics for Science and Technology  4.0  FS

Prerequisites: MATH 121.

-5 units selected from:

Select upper-division Computer Science (CSCI) or Computer Information Systems (CINS) courses, or EECE 555, and/or upper-division Math courses that meet a requirement for the Minor in Mathematics. A maximum of 3 units may be taken for credit/no credit grading.

Additional Computer Science Graduation Requirement:

Graduating seniors must complete an exit exam as a requirement for graduation. Passing the exam is not required for the degree; the scores will be used for program assessment. Consult the department office for examination details.

Grading Requirement:

All courses taken to fulfill major course requirements must be taken for a letter grade except those courses specified by the department as Credit/No Credit grading only.

A grade of C or higher is required in all Computer Science (CSCI), Computer Information Systems (CINS), Electrical/Electronic (EECE), Business Information Systems (BSIS), or Management Information Systems (MINS) courses used for the major.

Advising Requirement:

Advising is mandatory for all majors in this degree program. Consult your undergraduate advisor for specific information.

Honors in the Major:

Honors in the Major is a program of independent work in your major. It requires 6 units of honors course work completed over two semesters.

The Honors in the Major program allows you to work closely with a faculty mentor in your area of interest on an original performance or research project. This year-long collaboration allows you to work in your field at a professional level and culminates in a public presentation of your work. Students sometimes take their projects beyond the University for submission in professional journals, presentation at conferences, or academic competition. Such experience is valuable for graduate school and professional life. Your honors work will be recognized at your graduation, on your permanent transcripts, and on your diploma. It is often accompanied by letters of commendation from your mentor in the department or the department chair.

Some common features of Honors in the Major program are:

1. You must take 6 units of Honors in the Major course work. All 6 units are honors classes (marked by a suffix of H), and at least 3 of these units are independent study (399H, 499H, 599H) as specified by your department. You must complete each class with a minimum grade of B.
2. You must have completed 9 units of upper-division course work or 21 overall units in your major before you can be admitted to Honors in the Major. Check the requirements for your major carefully, as there may be specific courses that must be included in these units.
3. Your cumulative GPA should be at least 3.5 or within the top 5% of majors in your department.
4. Your GPA in your major should be at least 3.5 or within the top 5% of majors in your department.
5. Most students apply for or are invited to participate in Honors in the Major during the second semester of their junior year. Then they complete the 6 units of course work over the two semesters of their senior year.
6. Your honors work culminates with a public presentation of your honors project.

While Honors in the Major is part of the Honors Program, each department administers its own program. Please contact your major department or major advisor to apply.
Honors in Computer Science

In addition to the common requirements for the Honors in the Major program given above, the Honors in Computer Science program includes the following:

1. You must be recommended by a faculty member.
2. Students who are admitted to the department's Honors in the Major program must complete 3 units of CINS 465H, CINS 548H, CSCI 511H, CSCI 515H, CSCI 540H, CSCI 550H, CSCI 551H, CSCI 566H, CSCI 567H, CSCI 568H, or CSCI 580H, with a minimum grade of B. Unless other arrangements are made, the professor instructing the course you take becomes your faculty mentor. It is during this time that you must define a research problem or performance area and develop an Honors Research Project/Thesis proposal in preparation for work in CSCI 499H. You must also maintain a minimum GPA of 3.0 in your senior year.
3. Each Honors in the Major class requires completion of the course plus an additional Honors project and culminates with a public presentation of your Honors project.

Blended BS + MS (BMS) in Computer Science

Qualified students majoring in Computer Science may apply for the Blended BS + MS (BMS) program in Computer Science, allowing them to earn credit towards the MS at the same time they are completing the BS. See the catalog section on the BMS in Computer Science following the description of the MS in Computer Science.

Take any two of the following courses:

PHYS 204A Physics for Students of Science and Engineering: Mechanics
Prerequisites: High school physics or faculty permission. Concurrent enrollment in or prior completion of MATH 121 (second semester of calculus) or equivalent.
(advanced course substitution for GE B1)

PHYS 204B Physics for Students of Science and Engineering: Electricity and Magnetism
Prerequisites: MATH 121, PHYS 204A with a grade of C- or higher.

CHEM 111 General Chemistry
Prerequisites: Completion of ELM requirement; second-year high school algebra; one year high school chemistry.
(One year of high school physics and one year of high school mathematics past Algebra II are recommended.)
(advanced course substitution for GE B1)

CHEM 112 General Chemistry
Prerequisites: CHEM 111 with a grade of C- or better.

BIOL 151 Principles of Cellular and Molecular Biology
Prerequisites: Recommend CHEM 111 or concurrent enrollment.
(advanced course substitution for GE B2)

BIOL 152 Principles of Ecological, Evolutionary, and Organismal Biology
Prerequisites: BIOL 151 or faculty permission; recommend CHEM 112 or concurrent enrollment.
(advanced course substitution for GE B2)

BIOL 153 Principles of Physiology and Development
Prerequisites: BIOL 151; CHEM 112 or concurrent enrollment recommended.
(advanced course substitution for GE B2)