COMPUTER SCIENCE
UNDERGRADUATE STUDENT
HANDBOOK

2014-2016
Computer Science Department
College of Engineering and Computer Science
California State University, Sacramento

Website: www.ecs.csus.edu/csc
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DEPARTMENT OF COMPUTER SCIENCE MISSION STATEMENT

The mission of the Department of Computer Science is to:

- Be a department of choice for high-quality and innovative undergraduate and graduate degree programs in computer science, software engineering, and computer engineering.
- Educate a diverse student population.
- Foster research and professional development activities that enable faculty to maintain currency in their fields, and engage students in research.
- Provide technological leadership to the University community and the Sacramento region.
- Provide experiences that reflect state-of-the-art/state-of-the-practice by incorporating new areas and technologies into its academic programs.
- Strive to serve regional educational needs for professional development and interdisciplinary programs.
- Participate in the development of new technologies that drive local, regional, and national economies through interaction with industry.

B.S. OF COMPUTER SCIENCE PROGRAM EDUCATIONAL OBJECTIVES

Three to five years after graduation, a graduate of the B.S. in computer science should have:

1. Made contributions to the development, maintenance, and support of real world computing systems.
2. Taken initiative and assumed responsibilities as an effective member of project teams.
3. Worked independently and functioned effectively in an environment with incomplete information.
4. Progressed in the computing field, engaged in professional development, and/or pursued an advanced degree.
5. Produced quality technical and non-technical documents and presentations for a variety of audiences.
6. Adhered to the ethical standards of the profession and understood the implications of his/her professional activities.
COMPUTER SCIENCE STUDENT LEARNING OUTCOMES

At graduation, a B.S. in computer science graduate should be able to:

a. Apply fundamental knowledge of mathematics, algorithmic principles, computer theory, and principles of computing systems in the modeling and design of computer-based systems that demonstrate an understanding of tradeoffs involved in design choices.

b. Analyze a problem, specify the requirements, design, implement, and evaluate a computer-based system, process, component, or program that satisfies the requirements.

c. Apply design and development principles in the construction of software systems of varying complexity.

d. Use current skills, techniques, and tools necessary for computing practice.

e. Function effectively as a member of a team to accomplish a common goal.

f. Understand professional, ethical, and security issues and responsibilities.

g. Write effectively.

h. Give effective oral presentations.
<table>
<thead>
<tr>
<th>Faculty</th>
<th>Teaching Interests</th>
<th>Areas of Scholarship</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arad, Behnam</td>
<td>Hardware Design and Validation using EDA tools; Computer architecture; Parallel computing.</td>
<td>Design of Power-efficient Hardware; Validation of Complex Embedded Systems; Hardware Security.</td>
</tr>
<tr>
<td>Chang, Weide</td>
<td>Operating Systems; Compiler Construction; Computer Architecture.</td>
<td>Hidden Markov Modeling; Social Network Analysis.</td>
</tr>
<tr>
<td>Faroughi, Nikrouz</td>
<td>Digital Logic; Computer Architecture.</td>
<td>Single and Multiprocessor Systems Architecture; Computer Security through Hardware.</td>
</tr>
<tr>
<td>Ghansah, Isaac</td>
<td>Computer Security and Privacy; Computer Networks; Computer Architecture.</td>
<td>Security Issues in Critical Infrastructures such as Smart Grid; Computer Forensic Investigation.</td>
</tr>
<tr>
<td>Gordon, V. Scott</td>
<td>Artificial Intelligence; Graphics; Video Game Architecture.</td>
<td>Artificial Intelligence; Neural and Evolutionary Computation; Computer Science K12 Education.</td>
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<tr>
<td>Jin, Ying</td>
<td>Database Design, Database System Implementation, Data structures; Algorithm Analysis.</td>
<td>Database Systems and Applications; Event and Rule Processing in Centralized and Distributed Environments; Data Security and Privacy.</td>
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<tr>
<td>Krovetz, Ted</td>
<td>Computer programming; Discrete mathematics; Design and Analysis of Algorithms; Compilers; Cryptography.</td>
<td>High-speed Provable Symmetric Cryptography; Authenticated Encryption; Universal Hashing; Specification and Implementation of Cryptographic Algorithms.</td>
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<tr>
<td>Lan, Kwai-Ting</td>
<td>Operating systems; Computer Architecture; Web Technology.</td>
<td>Operating systems; Computer Architecture; 3D Graphics Technology; Web Technology.</td>
</tr>
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<td>Lu, Meiliu</td>
<td>Data Warehousing and Data Mining; Machine Learning; Algorithms; Computing Theory.</td>
<td>Knowledge Discovery in Databases; Big-data Applications; Machine Learning Algorithms Design and Applications; Education Capacity Building through User-paced Learning Tools.</td>
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<tr>
<td>Name</td>
<td>Areas of Study</td>
<td>Courses of Study</td>
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<tr>
<td>Salem, Ahmed</td>
<td>Software Engineering; Software Testing and Quality Assurance; System Requirements Engineering.</td>
<td>Requirements Specification and Design Modeling; Verification and Validation Methodology and Techniques; Information Assurance.</td>
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<td>Wang, Chung-E</td>
<td>Design and Analysis of Algorithms; Systems Programming; Computer Networking; Introductory Programming.</td>
<td>Algorithms; Parallel Computation; Computer Networking; Compression; Encryption; Computational Biology.</td>
</tr>
<tr>
<td>Zhang, Cui</td>
<td>Programming Language Theories and Paradigms; Formal Methods for Secure Software Engineering; Software Architecture.</td>
<td>Formal Methods for Secure Software Engineering; Secure Coding for Software Security; Software Architecture; Programming Language Theories and Paradigms.</td>
</tr>
</tbody>
</table>
CAREER POSSIBILITIES

♦ Computer Scientist  ♦ Computer Engineer
♦ Software Engineer  ♦ Computing Science Educator
♦ Information Technology Specialist  ♦ Computer Systems Analyst
♦ Scientific Application Programmer  ♦ Computer Operations Manager
♦ Computer Services Coordinator  ♦ Database Administrator
♦ Computer Game Developer  ♦ Data Communications Manager
♦ Data Processing Manager  ♦ Data Processing Application Programmer
♦ Network Administrator  ♦ Programmer Analyst
♦ Software Requirements Engineer  ♦ Software Architect
♦ Software Quality Assurance Specialist  ♦ Software Development Project Manager
♦ Systems Manager  ♦ Systems Programmer
♦ Computer Graphics Specialist  ♦ Knowledge Engineer
♦ Systems Engineer  ♦ Cyber Security Specialist
♦ Information Assurance Specialist  ♦ Information Security Officer
♦ Data Mining Analyst  ♦ Web/eCommerce Developer
♦ IT Business Analyst  ♦ IT Infrastructure Specialist
♦ Technical Control Specialist  ♦ Technical Representative
NEW – PROGRAM REQUIREMENTS  
(effective Fall 2014)

Units required for Major: 81  
Minimum total units required for BS: 120  
Grade of "C-" or better required in all courses applied to the Computer Science major.  
Note: Students graduating with a Bachelor of Science Computer Science will not be subject to the University's Foreign Language Graduation Requirement. Students who change major may be subject to the University’s Foreign Language Graduation Requirement.

Courses in parentheses are prerequisites.

A. Required Lower Division Courses (15 units)
(3) **CSC 15** Programming Concepts and Methodology I (**CSC 10** or programming experience in a high-level programming language)
(3) **CSC 20** Programming Concepts and Methodology II (**CSC 15**)
(3) **CSC 28** Discrete Structures for Computer Science (**MATH 26A** or **MATH 29**, and **CSC 20**; **CSC 20** may be taken concurrently)
(3) **CSC 35** Introduction to Computer Architecture (**CSC 15**)
(3) **CSC 60** Introduction to Systems Programming in UNIX (**CSC 20**, **CSC 35**)

B. Required Mathematics and Science Courses (24 units)
(3) **MATH 26A** Calculus I for the Social and Life Sciences (**MATH 11**) OR
(4) **MATH 30** Calculus I (**MATH 29** or four years of high school mathematics which includes two years of algebra, one year of geometry, and one year of mathematical analysis; completion of ELM requirement and Pre-Calculus Diagnostic Test)
(3) **MATH 26B** Calculus II for the Social and Life Sciences (**MATH 26A** or appropriate high school based AP credit) OR
(4) **MATH 31** Calculus II (**MATH 30** or appropriate high school based AP credit)
(4) **STAT 50** Introduction to Probability and Statistics (**MATH 26A, MATH 30**, or appropriate high school based AP credit) OR
(2) **ENGR 115** Statistics For Engineers (**MATH 31**, may be taken concurrently)
(4) **PHYS 5A** General Physics: Mechanics, Heat, Sound (recently completed three years of high school algebra and geometry; and a college course in algebra and trigonometry (**MATH 9** recommended) for those having an inadequate mathematics background) OR
(4) **PHYS 11A** General Physics: Mechanics (**MATH 30, MATH 31**; or equivalent certificated high school courses; **MATH 31** may be taken concurrently)

In addition to the above math and science courses (minimum 14 units), students must choose elective courses to bring the total number of math and science units to a minimum of 24. Eligible courses are:

(3-4) Any **MATH** or **STAT** course with calculus as a prerequisite
(5) **CHEM 1A** General Chemistry I (High school chemistry and college algebra; sufficient performance on the college algebra diagnostic test, or equivalent, or minimum grade of "C" in **CHEM 4**)
(4) **CHEM 1E** General Chemistry for Engineering (High school chemistry; **MATH 30** or eligibility to take **MATH 30** as evidenced by the calculus readiness diagnostic exam; passing score on a standardized Chemistry diagnostic
exam given prior to each semester, or minimum grade of "C" in CHEM 4)

(3) **CSC 148** Modeling and Experimental Design (MATH 26B or MATH 31, STAT 50 or ENGR 115 and proficiency in a programming language)

(3) **PHIL 160** Deductive Logic II (CSC 28 or PHIL 60 or instructor permission)

(4) **PHYS 5B** General Physics: Light, Electricity and Magnetism, Modern Physics (PHYS 5A or instructor permission)

(4) **PHYS 11B** General Physics: Heat, Light, Sound (MATH 31, PHYS 11A)

(4) **PHYS 11C** General Physics: Electricity and Magnetism, Modern Physics (MATH 31, PHYS 11A)

(3) **PHYS 106** Introduction to Modern Physics (MATH 31, PHYS 11A, PHYS 11B, PHYS 11C or PHYS 5A, PHYS 5B)

(3) **PHYS 162** Scientific Computing: Basic Methods (MATH 26A or MATH 30 and PHYS 5A, or MATH 30 and PHYS 11A or MATH 105A taken concurrently)

(3) **PHYS 163** Scientific Computing: Modeling, Simulation, and Visualization (PHYS 162)

**Note:** To satisfy the requirement of CAC, the Computing Accreditation Commission of ABET, which accredits computer science programs, **one or more electives must be from MATH, STAT or PHIL** (MATH 100 Recommended). Courses may not be selected with significantly overlapping topics. Students who select MATH 26A and MATH 26B for their calculus sequence must take STAT 50 and PHYS 5A, MATH 30, MATH 31, PHYS 11A and PHYS 11C are recommended for students considering graduate school or an engineering major. MATH 30, MATH 31 and STAT 50 are recommended for students considering a math or statistics minor. PHYS 5B, 11B or 11C; and PHYS 162 are recommended for students considering a scientific computing and simulation certificate and willing to take PHYS 163 as an additional course. If CSC 148 is chosen as an elective to meet the math and science requirements, it cannot be used for a computer science elective. An undergraduate handbook with further course selection advice is available at the department website.

**C. Required Upper Division Courses (33 units)**

(3) **CSC 130** Data Structures and Algorithm Analysis (CSC 20, CSC 28; CSC 28 may be taken concurrently)

(3) **CSC 131** Computer Software Engineering (CSC 130; may be taken concurrently)

(3) **CSC 133** Object-Oriented Computer Graphics Programming (CSC 130, CSC 131)

   **CSC 134** Database Management Systems (CSC 130)

(3) **CSC 135** Computing Theory and Programming Languages (CSC 28, CSC 35 and CSC 130)

(3) **CSC 137** Computer Organization (CSC 28, CSC 35, CSC 130)

(3) **CSC/CPE 138** Computer Networks and Internets (CSC 35, CSC 60, CSC 130)

(3) **CSC 139** Operating System Principles (CSC 60, CSC 137; or equivalents)

(2) **CSC 190** Senior Project: Part I (Senior status; GWAR Certification before Fall 09, or WPJ score of 70+, or at least C-in ENGL 109M/WW; CSC 130, CSC 131, and four additional 3-unit CSC upper division courses that fulfill the major requirements excluding CSC 192-195, CSC 198, CSC 199)

(2) **CSC 191** Senior Project: Part II (CSC 190)

(3) **PHIL 103** Business and Computer Ethics
(2) Select **two units** from the following:

(1) **CSC 192**  
Career Planning (1 unit maximum) (**CSC 130** and three additional upper-division courses that fulfill major requirements with a C- grade or better (excluding CSC 190-195, **CSC 198**, and **CSC 199**))

(1) **CSC 194**  
Computer Science Seminar (Upper division or graduate status in CSC)

(1-4) **CSC 195**  
Fieldwork in Computer Science (Instructor permission)

1-12  
**CSC 195A**  
Professional Practice (Instructor permission)

(1-3) **CSC 198**  
Co-curricular Activities in Computer Science

(1-3) **CSC 199**  
Special Problems

**D. Electives (9 units)**

In addition to the required lower-division and upper-division Computer Science courses, Computer Science majors must take additional elective courses, totaling at least nine (9) units, from undergraduate Computer Science courses numbered CSC 140 or above (excluding **CSC 192**, **CSC 194**, **CSC 195**, **CSC 195A**, **CSC 198**, **CSC 199**).

Course choices should be made with advisor consultation. With advance written approval from their advisor, the course instructor, and the Department Chair, students with a GPA of 3.0 or greater may take graduate courses as electives. In any case students must meet the prerequisite stated in the catalog prior to taking any elective course.

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**Academic Certificates**

In addition to completing the requirements for the Bachelor of Sciences in Computer Science degree program, students enrolled in the major may also complete one of the (optional) 9-12 unit Academic Certificate programs. Each certificate includes 9 required units which can overlap with elective coursework taken to satisfy the major requirements, with some of the certificates requiring 3 additional units (1 additional course) beyond the degree requirements. Students interested in earning a certificate in addition to their degrees should meet with an academic advisor.

**Requirements for Certificates**

Certain combinations of courses give students a deeper understanding of specialized areas in Computer Science. Completion of any of the following course lists entitles the student to receive a certificate indicating that they concentrated their elective study in the particular area. The Computer Science Department will try and offer on a regular basis all courses required for each certificate, but course cancellations and scheduling conflicts do sometimes occur causing students difficulty in completing their desired course study. In such situations, students may need to forgo completion of their certificate. Printed certificates must be requested directly from the Computer Science Department office after a student graduates.

**Requirements - Certificate - Cyber Defense and Operations (12 units)**

*Courses in parentheses are prerequisites*

The Cyber Defense and Operations certificate includes the same courses as the Information Assurance and Security certificate, but additional requires advanced study in operating systems. An understanding of operating system pragmatics better prepares students for the technical work needed in defending and hardening networked computer systems. Students will not be awarded the Information Assurance and Security certificate if they complete the requirements for the Cyber Defense and Operations certificate.

(3) **CSC 152**  
Cryptography (**CSC 60, CSC 130**, and **STAT 50** or **ENGR 115**)

(3) **CSC 153**  
Computer Forensics Principles and Practices (**CSC 138** or **CPE 138**)

(3) **CSC 154**  
Computer System Attacks and Countermeasures (**CSC 138** or **CPE 138**)

(3) **CSC/CPE 159**  
Operating System Pragmatics (**CSC 139**)
Requirements - Certificate - Game Engineering (12 units)

Courses in parentheses are prerequisites

This certificate is intended to give students an opportunity to explore the science and engineering of computer games, and to prepare students for careers in those fields of computing which utilize or are heavily impacted by advances in computer gaming. These include such areas as video and strategy game development, 3-D graphics, modeling and animation and their support tools, intelligent decision making, specialized user interface hardware, machine learning, and working in interdisciplinary teams.

(3) **CSC 155**  Advanced Computer Graphics (CSC 133)

(3) **CSC 165**  Computer Game Architecture and Implementation (MATH 26A or MATH 30; PHYS 5A or PHYS 11A; CSC 130 and CSC 133)

(3) **CSC 180**  Intelligent Systems (MATH 26B or MATH 31; STAT 50 or ENGR 115; CSC 130 and CSC 135)

(3) Select one of the following:

- **CSC 126/ART 142**  3D Computer Modeling (CSC 10 or ART 97)
- **CSC 127/ART 143**  3D Computer Animation (ART 142 or CSC 126)
- **CSC/CPE 159**  Operating System Pragmatics (CSC 139)
- **CSC 177**  Data Warehousing and Data Mining (STAT 50 or ENGR 115; and CSC 134)

Requirements - Certificate - Information Assurance and Security - (9 units)

Courses in parentheses are prerequisites

The Information Assurance and Security certificate is designed to help students advance their technical skills to prepare for a leadership role in planning, managing, certifying and accrediting a security and incident response plan for their organization - including methods to combat threats to organization information resources, which in today's world is becoming top priority for many businesses since most information is in electronic form.

(3) **CSC 152**  Cryptography (CSC 60, CSC 130; and STAT 50 or ENGR 115)

(3) **CSC 153**  Computer Forensics Principles and Practices (CSC 138 or CPE 138)

(3) **CSC 154**  Computer System Attacks and Countermeasures (CSC 138 or CPE 138)

Requirements - Certificate - Software Engineering (12 units)

Courses in parentheses are prerequisites

The Software Engineering certificate is designed to focus on the principles of designing, building, testing and maintaining reliable, efficient, and secure software systems. The certificate is designed to emphasize the knowledge, competencies, and skills needed to produce competent graduates to begin a professional career in the field of software engineering, or pursue graduate programs.

(3) **CSC 170**  Software Requirements and Specification (CSC 131)

(3) **CSC 171**  Software Engineering Project Management (CSC 131)

(3) **CSC 179**  Software Testing and Quality Assurance(CSC 131)
(3) Select one of the following:

- **CSC 154** Computer System Attacks and Countermeasures (CSC 138 or CPE 138)
- **CSC 174** Advanced Database Management Systems (CSC 131, CSC 134)
- **CSC 176** Database Architecture and Optimization (CSC 174)
- **CSC 177** Data Warehousing and Data Mining (STAT 50 or ENGR 115; and CSC 134)

**Requirements - Certificate - Systems Software (12 units)**

Courses in parentheses are prerequisites

The Systems Software Certificate provides necessary background to participate in the development of low-level software for computer hardware and the software infrastructure needed by application developers. Understanding how such software operates makes students valuable additions to interdisciplinary teams where exploiting features of systems tools is important. The certificate will also prepare students to design, implement, and be effective users of systems tools such as language processors, utilities, and diagnostic tools.

(3) **CSC 151** Compiler Construction (CSC 135)

(3) **CSC /CPE 159** Operating System Pragmatics (CSC 139)

(6) Select two of the following:

- (3) **CSC /CPE 142** Advanced Computer Organization (CSC 137 or CPE 166 and CPE 185)

(3) **CSC 148** Modeling and Experimental Design (MATH 26B or MATH 31, STAT 50 or ENGR 115 and proficiency in a programming language)

(3) **CSC 154** Computer System Attacks and Countermeasures (CSC 138 or CPE 138)

(3) **CSC 155** Advanced Computer Graphics (CSC 133)

(3) **CSC 165** Computer Game Architecture and Implementation (MATH 26A or MATH 30; PHYS 5A or PHYS 11A; CSC 130 and CSC 133)
1. General Advice

Math and science requirements are flexible, allowing many choices. The courses you choose should reflect your goals, preparation and interests.

Calculus. Your first choice is whether to take MATH 26A/26B or MATH 30/31. The MATH 26 sequence is more conceptual and focuses on applications in social and life science. MATH 26A/26B is less rigorous than MATH 30/31, requiring only Algebra II from high school (or MATH 11) as a prerequisite. MATH 30/31 is designed for math, science and engineering majors; and prepares students for more advanced study in mathematics. Which should you take? You should probably take MATH 30/31 if you have done well in mathematics courses through pre-calculus, you are considering graduate study or changing majors to engineering, or you would like to take some more advanced math courses. MATH 30/31 leaves open to you more options.

Statistics. If you take MATH 26A/26B, then you must take STAT 50. If you take MATH 30/31 then you have a choice between STAT 50 and ENGR 115. STAT 50 is a four unit course that covers a wider variety of topics at a deeper level. ENGR 115 is a two unit short course with most students and examples coming from the realm of engineering. STAT 50 should be taken unless the two unit difference allows you to take an extra math or science course that otherwise would not fit in your academic plan.

Physics. If you take MATH 26A/26B, then you must take PHYS 5A. If you take MATH 30/31 then you have a choice between PHYS 5A and PHYS 11A. PHYS 11A uses calculus to explain many natural phenomena and PHYS 5A does not. If you take MATH 30/31, PHYS 11A is recommended. It’s a perfect opportunity to see why Isaac Newton needed to invent calculus. When you choose your electives, PHYS 5B and PHYS 11C are good choices because they deal with electricity, which helps understand computer hardware at the physical level.

Electives. Beyond the courses discussed above, you must complete enough additional math and science electives to bring your math and science total to at least 24 units. Depending on the calculus and statistics course you choose, this means an additional 8-10 units. At least one elective course must be another math or statistics course, or PHIL 160, but the remainder may be either more math or more science. Because linear algebra is a pervasive tool in many branches of science and engineering, including computer science, MATH 100 is highly recommended as one of your elective choices.

Math minor, statistics minor or physics certificate. You can get a math or statistics minor (which is a great complement to computer science and looks good on your resume) if you complete MATH 30, MATH 31, STAT 50 and three upper division math or statistics courses. These six courses along with PHYS 5A or PHYS 11A will satisfy the computer science math and science requirements and earn you a minor at the same time. This path requires 25 units of math and science, which is only one more than what is already required. Some upper-division applied math courses especially good for computer science are MATH 100, 150, and STAT 155. Students wanting a strong background in probability and statistics can get a math minor by taking MATH 100, STAT 115A, 115B, or a statistics minor by taking STAT 103, 115A, 115B. You can receive a “scientific computing and simulation” certificate from the physics department if you choose PHYS 5B or 11C, and PHYS 162 and 163 as electives, but this requires a minimum of 27 units (ie, one extra class).

Questions? See your advisor.
2. Sample Math and Science Pathways

The following are common ways to satisfy the math and science requirements. You may choose one that meets your goals, preparation and interests, or design your own pathway. As always, see your advisor if you have any questions.

**First Year and Transfer Students (24-26 units)**

Requirements: MATH 30, MATH 31, STAT 50 or ENGR 115, PHYS 11A
Electives: MATH 100, PHYS 11C, and any math or science elective of interest

Notes: Good for first-year students who have done well in a pre-calculus course or are considering graduate school or changing majors to computer engineering. Also good for transfer students who have already taken MATH 30, 31, and PHYS 11A, 11C (eg, AS-T degree holders).

**MATH 26A/26B (24 units)**

Requirements: MATH 26A, MATH 26B, STAT 50, PHYS 5A
Electives: MATH 100, PHYS 5B, and any math or science elective of interest

Notes: For students not interested in MATH 30/31. Elective options are limited because many courses have MATH 30 or 31 as prerequisite.

**Math Minor (25 units)**

Requirements: MATH 30, MATH 31, STAT 50, PHYS 11A
Electives: Any three upper-division MATH or STAT courses with calculus as a prerequisite.

Notes: Highly recommended courses are MATH 100, 150 and STAT 155. Other good courses are MATH 101, 170, STAT 115A, 115B.

**Statistics Minor (25 units)**

Requirements: MATH 30, MATH 31, STAT 50, PHYS 11A
Electives: STAT 103, STAT 115A, STAT 115B.

**Scientific Computing and Simulation Certificate (27-29 units)**

Option 1: MATH 30, 31, 100, STAT 50 or ENGR 115, PHYS 11A, 11C, 162, 163
Option 2: MATH 26A, 26B, 100, STAT 50, PHYS 5A, 5B, 162, 163

Notes: In both options, a math elective is also required. MATH 100 is recommended.

**Math courses for computer science students**

All of the following courses are appropriate for computer science majors and count as a math elective. (Prerequisites in parentheses). More applied courses: MATH 100 Applied Linear Algebra (MATH 26B or 31), MATH 150 Numerical Analysis (MATH 31), STAT 103 Intermediate Statistics (STAT 50), STAT 155 Introduction to Techniques of Operations Research (MATH 31, STAT 50). More theoretical: MATH 101 Combinatorics (MATH 31), MATH 170 Linear Programming (MATH 31, 100), PHIL 160 Deductive Logic II (CSC 28), STAT 115A Introduction to Probability Theory (STAT 50).
## 3. Math 26A/26B Track vs Math 30/31 Track

### MATH 26A/26B Track (24 units)

**Required (14)**

<table>
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<tr>
<th>Course</th>
<th>Title</th>
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<tbody>
<tr>
<td>(3) MATH 26A</td>
<td>Calculus I for Social and Life Sciences (MATH 11)</td>
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<tr>
<td>(3) MATH 26B</td>
<td>Calculus II for Social and Life Sciences (MATH 26A or appropriate high school based AP credit)</td>
</tr>
<tr>
<td>(4) STAT 50</td>
<td>Introduction to Probability and Statistics (MATH 26A or MATH 30)</td>
</tr>
<tr>
<td>(4) PHYS 5A</td>
<td>General Physics: Mechanics, Heat, Sound (MATH 9)</td>
</tr>
</tbody>
</table>

**Electives (10)**

Note: To satisfy the requirement of CAC, the Computing Accreditation Commission of ABET, which accredits computer science programs, **one or more electives must be from MATH, STAT, or PHIL** (MATH 100 Linear Algebra is recommended).

<table>
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<tr>
<th>Course</th>
<th>Title</th>
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<tbody>
<tr>
<td>(3) MATH 100</td>
<td>Linear Algebra (MATH 26B or MATH 31)</td>
</tr>
<tr>
<td>(3) CSC 148</td>
<td>Modeling and Experimental Design (MATH 26B or MATH 31, STAT 50 or ENGR 115, and proficiency in a programming language)</td>
</tr>
<tr>
<td>(5) CHEM 1A</td>
<td>General Chemistry I (High school chemistry, college algebra, or minimum grade of “C” in CHEM 4)</td>
</tr>
<tr>
<td>(3) PHIL 160</td>
<td>Deductive Logic II (CSC 28 or PHIL 60)</td>
</tr>
<tr>
<td>(4) PHYS 5B</td>
<td>General Physics: Light, Electricity, and Magnetism, Modern Physics (PHYS 5A)</td>
</tr>
<tr>
<td>(3) PHYS 162</td>
<td>Scientific Computing: Basic Methods (MATH 26A or MATH 30 and PHYS 5A, or MATH 30 and PHYS 11A, or MATH 105A concurrently)</td>
</tr>
<tr>
<td>(3) PHYS 163</td>
<td>Scientific Computing: Modeling, Simulation, and Visualization (PHYS 162)</td>
</tr>
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### MATH 30/31 Track (24 units)

**Required (14-16)**

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<th>Course</th>
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<tr>
<td>(4) MATH 30</td>
<td>Calculus I (MATH 29)</td>
</tr>
<tr>
<td>(4) MATH 31</td>
<td>Calculus II (MATH 30)</td>
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<tr>
<td>(2-4)</td>
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</tr>
<tr>
<td>(4) STAT 50</td>
<td>Introduction to Probability and Statistics (MATH 26A or MATH 30)</td>
</tr>
<tr>
<td>or</td>
<td></td>
</tr>
<tr>
<td>(2) ENGR 115</td>
<td>Statistics for Engineers (MATH 31, may be taken concurrently)</td>
</tr>
<tr>
<td>(4) PHYS 5A</td>
<td>General Physics: Mechanics, Heat, Sound (MATH 9)</td>
</tr>
<tr>
<td>or</td>
<td></td>
</tr>
<tr>
<td>(4) PHYS 11A</td>
<td>General Physics: Mechanics (MATH 30, 31)</td>
</tr>
</tbody>
</table>

**Electives (8-10)**

Note: To satisfy the requirement of CAC, the Computing Accreditation Commission of ABET, which accredits computer science programs, **one or more electives must be from MATH, STAT, or PHIL** (MATH 100 Linear Algebra is recommended).

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>(3-4)</td>
<td>Any MATH or STAT course with calculus as a prerequisite may be taken, e.g., MATH 32, 45, 100, 101, 102.</td>
</tr>
<tr>
<td>(3) CSC 148</td>
<td>Modeling and Experimental Design (MATH 26B or MATH 31, STAT 50 or ENGR 115, and proficiency in a programming language)</td>
</tr>
<tr>
<td>(5) CHEM 1A</td>
<td>General Chemistry I (High school chemistry, college algebra, or “C” in CHEM 4)</td>
</tr>
<tr>
<td>(4) CHEM 1E</td>
<td>General Chemistry for Engineering (MATH 30 and minimum grade of “C” in CHEM 4)</td>
</tr>
<tr>
<td>(3) PHIL 160</td>
<td>Deductive Logic II (CSC 28 or PHIL 60)</td>
</tr>
</tbody>
</table>
(4) PHYS 5B  General Physics: Light, Electricity, and Magnetism, Modern Physics  (PHYS 5A)
(4) PHYS 11B  General Physics: Heat, Light, and Sound  (MATH 31, PHYS 11A)

(4) PHYS 11C  General Physics: Electricity and Magnetism, Modern Physics  (MATH 31, PHYS 11A)
(3) PHYS 106  Introduction to Modern Physics Computing (MATH 31; PHYS 11A, PHYS 11B, PHYS 11C or PHYS 5A, 5B)
(3) PHYS 162  Scientific Computing: Basic Methods  (MATH 26A or MATH 30 and PHYS 5A, or MATH 30 and PHYS 11A, or MATH 105A concurrently)
(3) PHYS 163  Scientific Computing: Modeling, Simulation, and Visualization (PHYS 162)
**MAJOR Status: Pre-CSC vs CSC...**

ALL undergraduate students, even transfer students, enter Sac State as a Pre-major (aka "Pre-computer science").

Students remain “Pre-CSC” while completing all of the lower division requirements (ie CSC 15, 20, 28, 35, 60; Math 26A/26B track **OR** Math 30/31 track). Once you have completed all the required courses with a C- grade or better, you need to complete the Change of Major form to switch from “Pre-CSC” to full “CSC” major. After you submit the form to the department for approval, it will be forwarded to Admissions and Records on your behalf.

Please know that a lot of the upper division courses (CSC 133 and above) have a prerequisite that requires full major (ie CSC) status. Be aware that failure to complete the lower division requirements in a timely manner may cause problems during the registration process.

---

**Computer Science Department**  
**CHANGE OF MAJOR REQUEST FORM**  
(Undergraduates Only)

<table>
<thead>
<tr>
<th>Student Name:</th>
<th>SAC STATE ID #:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Street Address:</td>
<td>Telephone:</td>
</tr>
<tr>
<td>City, State, Zip:</td>
<td>CSUS GPA:</td>
</tr>
<tr>
<td>Email (mandatory):</td>
<td>Overall GPA:</td>
</tr>
<tr>
<td>Current major:</td>
<td>Catalog Year:</td>
</tr>
</tbody>
</table>

Check only one option and sign below:

1. **Pre-Computer Science (2.0 CSUS and overall GPA is necessary)**
   a student enters the major as "Pre-CSC" until you have completed all the courses listed below

2. **Computer Science (2.0 CSUS and overall GPA is necessary, plus completion of the courses below with a C- grade or better)**
   * To verify your completion of these courses with a C- or better, attach a print-out of your unofficial transcript from "MY SAC STATE" (https://my.csus.edu).
   * HIGHLIGHT OR CIRCLE the completed courses on the print-out.
   * For unverifiable courses, read the instructions on the reverse side of this document (Verification of transcript by the advisor/Registrar)
   * Complete the Change of Major form with the Computer Science Department.

Note: Students who do not pass any course due to lack of prerequisites will be required to take the course if it is a prerequisite to another required course or deemed elective.

Student Signature:  
Date:

Department/Program Recommendation:  
Effective (Semester/Yr)

Approved:  
Comments:

CSC Major Code 07012  
CSC, Major Code 07011

By:  
Date:

CSC Chair / CSC Assoc. Chair

Website: [www.ecs.csus.edu/csc](http://www.ecs.csus.edu/csc)
PREREQUISITES AND CATALOG RIGHTS

**YES, you must take prerequisites!**
♦ The computerized “MY SAC STATE” registration system enforces individual prerequisites (as well as full major status in the case of upper division CSC courses).
♦ You may view a full list of prerequisites in this handbook.
♦ Pay special attention to prerequisite sequences because they require planning *two to four semesters in advance*.

**Please note that prerequisites override catalog rights.**
♦ When changes are made to pre-requisites there is usually a grace period for current students. After that period even if your catalog rights exempt you from a course, you *must* take it if it is a prerequisite to a course you wish to take.

**Speaking of catalog rights...**
Since University requirements change periodically, it is important that you know which set of GE and major requirements apply to you, and what catalog options are available to you:
♦ **Freshmen.** Students who enter Sacramento State as freshmen use the catalog requirements in effect when they begin at Sacramento State. For example, if you graduated from high school last Spring and began at Sacramento State in the Fall Semester 2014, your catalog rights begin in Fall 2014 and you are required to fulfill the GE and major requirements outlined in the University catalog in effect in Fall 2014. As long as you maintain continuous enrollment (defined below), you will not be responsible for any requirements added after that time. Students also have the option of choosing to meet the catalog requirements in effect when they graduate from Sacramento State.

♦ **Transfer Students.** Students who transfer to Sacramento State may use (1) the catalog requirements in effect when they enter Sacramento State, (2) the catalog requirements in effect when they graduate from Sacramento State, or (3) the requirements which were in effect when their continuous enrollment (defined below) began. For example, if you began at Sierra College in Fall 2012 and have been continuously enrolled since then, you have catalog rights to Fall 2012.

♦ **Continuous Enrollment** - begins when you have graduated from high school and enroll in either a California State University (such as Sacramento State) or a California Community College (such as American River College). You maintain continuous enrollment as long as you register one semester in each calendar year.

♦ For more information, please see: [http://www.csus.edu/schedule/Fall2014Spring2015/advisingfaq.html#cat](http://www.csus.edu/schedule/Fall2014Spring2015/advisingfaq.html#cat)
### CURRICULUM PATTERN ROADMAPS

#### FOUR YEAR PLAN

**COMPUTER SCIENCE**

Minimum total units required for B.S. Degree: 120* + (81 units required from Major department)

- Additional courses may be needed to meet graduation requirements.

This form is designed to be used in partnership with GE and Major advisors - modifications may be necessary to meet the unique needs of each student. See your major adviser each semester to stay on track and graduate! Consult the department website for detailed advising on the math/science requirements.

#### YEAR 1

<table>
<thead>
<tr>
<th>Semester</th>
<th>Course 1</th>
<th>Course 2</th>
<th>Course 3</th>
<th>Course 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sem. 1</td>
<td>CSC 15</td>
<td>CSC 15</td>
<td>MATH 26A/36 (84)</td>
<td>A1:</td>
</tr>
<tr>
<td></td>
<td>CSC 26</td>
<td></td>
<td>MATH 108/108 (89)</td>
<td>A2:</td>
</tr>
<tr>
<td>Sem. 2</td>
<td></td>
<td></td>
<td>College Comp.</td>
<td>B1:</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>C2 or C3</td>
<td>B2:</td>
</tr>
</tbody>
</table>

**TOTAL = 18-19 UNITS**

#### YEAR 2

<table>
<thead>
<tr>
<th>Semester</th>
<th>Course 1</th>
<th>Course 2</th>
<th>Course 3</th>
<th>Course 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sem. 3</td>
<td>CSC 28</td>
<td>CSC 35</td>
<td>PHYS 5A/11A (81 &amp; R3)</td>
<td>C2 or C3</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>D: U.S. GOVT</td>
</tr>
<tr>
<td>Sem. 4</td>
<td>CSC 60</td>
<td>CSC 130</td>
<td>Math/Science Elect. †</td>
<td>D: U.S. HIST</td>
</tr>
</tbody>
</table>
<pre><code>                    |          |          |          | 15-17 UNITS |
</code></pre>

**TOTAL = 18-19 UNITS**

#### YEAR 3

<table>
<thead>
<tr>
<th>Semester</th>
<th>Course 1</th>
<th>Course 2</th>
<th>Course 3</th>
<th>Course 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sem. 5</td>
<td>CSC 131</td>
<td>CSC 134</td>
<td>STAT 50/ENGR 115</td>
<td>C2 or C3</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>D: PHIL 103 (UD GE)</td>
</tr>
<tr>
<td>Sem. 6</td>
<td>CSC 135</td>
<td></td>
<td></td>
<td>C1 or C2</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>15-17 UNITS</td>
</tr>
</tbody>
</table>

**TOTAL = 15-17 UNITS**

#### YEAR 4

<table>
<thead>
<tr>
<th>Semester</th>
<th>Course 1</th>
<th>Course 2</th>
<th>Course 3</th>
<th>Course 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sem. 7</td>
<td>CSC 139</td>
<td>CSC 190</td>
<td>CSC 138</td>
<td>C2: UD GE +</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>CSC Elective</td>
<td>15 UNITS</td>
</tr>
<tr>
<td>Sem. 8</td>
<td>CSC 191</td>
<td></td>
<td>Math/Science Elect. †</td>
<td>12-14 UNITS</td>
</tr>
</tbody>
</table>

**TOTAL = 12-14 UNITS**

---

### TRANSFER PLAN

**COMPUTER SCIENCE**

Minimum total units required for B.S. Degree: 120* + (81 units required from Major department)

- Additional courses may be needed to meet graduation requirements.

This form is designed to be used in partnership with GE and Major advisors - modifications may be necessary to meet the unique needs of each student. See your major adviser each semester to stay on track and graduate! Consult the department website for detailed advising on the math/science requirements.

**60 + TRANSFER UNITS**

#### YEAR 1

<table>
<thead>
<tr>
<th>Semester</th>
<th>Course 1</th>
<th>Course 2</th>
<th>Course 3</th>
<th>Course 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sem. 1</td>
<td>CSC 120</td>
<td>CSC 131</td>
<td>STAT 50 or ENGR 115</td>
<td>D: PHIL 103 (UD GE)</td>
</tr>
<tr>
<td></td>
<td>CSC 133</td>
<td>CSC 134</td>
<td>CSC 138</td>
<td>C or D:</td>
</tr>
<tr>
<td>Sem. 2</td>
<td></td>
<td></td>
<td>CSC 137</td>
<td>14-16 UNITS</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Math/Science Elect. †</td>
<td>18-17 UNITS</td>
</tr>
</tbody>
</table>

**TOTAL = 15-17 UNITS**

#### YEAR 2

<table>
<thead>
<tr>
<th>Semester</th>
<th>Course 1</th>
<th>Course 2</th>
<th>Course 3</th>
<th>Course 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sem. 3</td>
<td>CSC 139</td>
<td>CSC 190</td>
<td></td>
<td>C or D: UD GE</td>
</tr>
<tr>
<td></td>
<td>CSC 191</td>
<td>CSC Elective</td>
<td>15-15 UNITS</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Math/Science Elect. †</td>
<td>12-14 UNITS</td>
<td></td>
</tr>
</tbody>
</table>

**TOTAL = 12-14 UNITS**

---

**COMPLETION of CSC 10, 20, 21, 30, 35, 36; MATH 3A or 20, 21B or 21, PHYS 5A or 11A, one Math/Science Elective, College Composition, GE area A, B2, 4 courses from areas C & D (no more than 3 zeros D's) before upper division courses**

**NOTES:**

- Separating in required upper division courses should be determined on the basis of pre-requisites and preparation for CSC electives. These electives are not utilized every semester. A tentative two year utilizing plan is available in the department office.

- **Completion of** CSC 20, 21, 30, 35, 36, MATH 3A or 20, 21B or 21, PHYS 5A or 11A, one Math/Science Elective; College Composition, GE area A, B2, 4 courses from areas C & D (no more than 3 zeros D’s) before upper division courses.
# Computer Science Course Prerequisites

<table>
<thead>
<tr>
<th>Course # and Title</th>
<th>Prerequisite(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CSC 15:</strong> Programming Concepts and Methodology I</td>
<td>CSC 10, or programming experience in a high-level programming language.</td>
</tr>
<tr>
<td><strong>CSC 20:</strong> Programming Concepts and Methodology II</td>
<td>CSC 15</td>
</tr>
<tr>
<td><strong>CSC 28:</strong> Discrete Structures for Computer Science</td>
<td>MATH 26A or MATH 29, CSC 20; CSC 20 may be taken concurrently</td>
</tr>
<tr>
<td><strong>CSC 35:</strong> Introduction to Computer Architecture</td>
<td>CSC 15</td>
</tr>
<tr>
<td><strong>CSC 60:</strong> Introduction to Systems Programming in UNIX</td>
<td>CSC 20, CSC 35</td>
</tr>
<tr>
<td><strong>CSC 130:</strong> Data Structures and Algorithm Analysis</td>
<td>CSC 20, CSC 28; CSC 28 may be taken concurrently</td>
</tr>
<tr>
<td><strong>CSC 131:</strong> Computer Software Engineering</td>
<td>CSC 130; may be taken concurrently</td>
</tr>
<tr>
<td><strong>CSC 133:</strong> Object-Oriented Computer Graphics Programming</td>
<td>CSC 130, CSC 131</td>
</tr>
<tr>
<td><strong>CSC 134:</strong> Database Management and File Organization</td>
<td>CSC 130</td>
</tr>
<tr>
<td><strong>CSC 135:</strong> Computing Theory and Programming Languages</td>
<td>CSC 28, CSC 35, CSC 130</td>
</tr>
<tr>
<td><strong>CSC 137:</strong> Computer Organization</td>
<td>CSC 28, CSC 35, CSC 130</td>
</tr>
<tr>
<td><strong>CSC 138:</strong> Computer Networks and Internets</td>
<td>CSC 35, CSC 60, CSC 130</td>
</tr>
<tr>
<td><strong>CSC 139:</strong> Operating System Principles</td>
<td>CSC 60, CSC 137; or equivalents</td>
</tr>
<tr>
<td><strong>CSC 140:</strong> Advanced Algorithm Design and Analysis</td>
<td>CSC 130</td>
</tr>
<tr>
<td><strong>CSC 142:</strong> Advanced Computer Organization</td>
<td>CSC 137</td>
</tr>
<tr>
<td><strong>CSC 148:</strong> Modeling and Experimental Design</td>
<td>MATH 31, STAT 50, and proficiency in a programming language</td>
</tr>
<tr>
<td><strong>CSC 151:</strong> Compiler Construction</td>
<td>CSC 135</td>
</tr>
<tr>
<td><strong>CSC 152:</strong> Cryptography</td>
<td>CSC 60, CSC 130, Stat 50</td>
</tr>
<tr>
<td><strong>CSC 153:</strong> Computer Forensics Principles and Practices</td>
<td>CSC 138</td>
</tr>
<tr>
<td><strong>CSC 154:</strong> Computer System Attacks and Countermeasures</td>
<td>CSC 138</td>
</tr>
<tr>
<td><strong>CSC 155:</strong> Advanced Computer Graphics</td>
<td>CSC 133</td>
</tr>
<tr>
<td><strong>CSC 159:</strong> Operating System Pragmatics</td>
<td>CSC 139</td>
</tr>
<tr>
<td><strong>CSC 165:</strong> Computer Game Architecture and Implementation</td>
<td>CSC 130, CSC 133, Math 30, Physics 11A</td>
</tr>
<tr>
<td><strong>CSC 170:</strong> Software Requirements and Specification</td>
<td>CSC 131</td>
</tr>
<tr>
<td><strong>CSC 171:</strong> Software Engineering Project Management</td>
<td>CSC 131</td>
</tr>
<tr>
<td><strong>CSC 174:</strong> Database Management Systems</td>
<td>CSC 131, CSC 134</td>
</tr>
<tr>
<td><strong>CSC 176:</strong> Advanced Database Management Systems</td>
<td>CSC 174</td>
</tr>
<tr>
<td><strong>CSC 177:</strong> Data Warehousing and Data Mining</td>
<td>CSC 134, Stat 50</td>
</tr>
<tr>
<td><strong>CSC 179:</strong> Software Testing and Quality Assurance</td>
<td>CSC 131</td>
</tr>
<tr>
<td><strong>CSC 180:</strong> Intelligent Systems</td>
<td>CSC 130, CSC 135, Math 31, Stat 50</td>
</tr>
<tr>
<td><strong>CSC 190:</strong> Senior Project: Part I</td>
<td>Senior status; (GWAR Certification before Fall 09, or WPJ score of 70+, or at least a C- in ENGL 109M/W); CSC 130, CSC 131, and four additional 3-unit CSC upper division courses that fulfill the major requirements excluding CSC 192-195, CSC 198, CSC 199</td>
</tr>
<tr>
<td><strong>CSC 191:</strong> Senior Project-Part II</td>
<td>CSC 190</td>
</tr>
</tbody>
</table>
Computer Science Electives by Topic

You are required to take three Computer Science upper-division elective courses. We offer a variety of topics to supplement the knowledge you will gain in the core requirements; many of them also reflect the special interests of the faculty. Electives are numbered from 140 to 189. In addition, experimental courses are offered under the number 196X (where X is a letter); these can also be used to satisfy this requirement. Currently, electives are offered in the following areas (prerequisites are listed in parenthesis):

♦ **Advanced Algorithms**  
  CSc 140 Advanced Algorithm Design and Analysis (CSc 130)

♦ **Artificial Intelligence**  
  CSc 180 Intelligent Systems (CSc 130, CSc 135, Math 31, Stat 50)

♦ **Compilers**  
  CSc 151 Compiler Construction (CSc 135)

♦ **Computer Architecture**  
  CSc 142 Advanced Computer Organization (CSc 137)

♦ **Computer Games**  
  CSc 165 Computer Games Architecture and Implementation (CSc 130, CSc 133, Math 30, Physics 11A)

♦ **Database and Data Mining**  
  CSc 174 Database Management Systems (CSc 131, CSc 134)  
  CSc 176 Advanced Database Management Systems (CSc 174)  
  CSc 177 Data Warehousing and Data Mining (CSc 134, Stat 50)

♦ **Data Communication and Networking**  
  See 196 courses

♦ **Graphics**  
  CSc 155 Advanced Computer Graphics (CSc 133)

♦ **Information Security**  
  CSc 152 Cryptography (CSc 60, CSc 130, Stat 50)  
  CSc 153 Computer Forensics Principles and Practice (CSc 138)  
  CSc 154 Computer Systems Attack and Countermeasures (CSc 138)

♦ **Operating Systems**  
  CSc 159 Operating System Pragmatics (CSc 139)

♦ **Simulation**  
  CSc 148 Modeling and Experimental Design (Math 31, Stat 50)

♦ **Software Engineering**  
  CSc 170 Software Requirements and Specification (CSc 131)  
  CSc 171 Software Engineering Project Management (CSc 131)  
  CSc 179 Software Testing and Quality Assurance (CSc 131)

Since most of these courses are not offered every semester (a two-year schedule for electives is included in this manual), it is recommended that students plan their programs carefully to ensure that they have the proper prerequisites at the time their chosen electives are offered. Prerequisite sequences are noted on the next page.
Prerequisite Sequences for Computer Science Electives

Note: Math and other non-computer science prerequisites are not listed here.

♦ Advanced Algorithms
   130 → 140* (requires at least 2 semesters)

♦ Artificial Intelligence
   35 and 130 → 135 → 180* (requires at least 3 semesters)

♦ Compilers and Operating Systems
   35 and 130 → 135 → 151* (requires at least 3 semesters)
   35 and 130 → 60 and 137 → 139 → 159 (requires 4 semesters)

♦ Computer Architecture
   35 and 130 → 137 → 142 (requires 3 semesters)

♦ Database and Data Mining
   130 and 131 → 134 → 174 (requires at least 3 semesters)
   130 and 131 → 134 → 174 → 176* (requires at least 4 semesters)
   130 → 134 → 177* (requires at least 3 semesters)

♦ Graphics and Computer Games
   130 and 131 → 133 → 155* (requires at least 3 semesters)
   130 → 133 → 165* (requires at least 3 semesters)

♦ Information Security
   60 and 130 → 152* (requires at least 2 semesters)
   60 and 130 → 138 → 153* (requires at least 3 semesters)
   60 and 130 → 138 → 154* (requires at least 3 semesters)

♦ Simulation
   No upper division → 148*

♦ Software Engineering
   130 and 131 → 170 (requires at least 2 semesters)
   130 and 131 → 171* (requires at least 2 semesters)
   130 and 131 → 179* (requires at least 2 semesters)

*May not be offered every semester.
# Computer Science Elective Schedule

Most current version on website: [http://www ecs csus edu/wcm/csc/pdfs/tentative bs_schedule.pdf](http://www.ecs.csus.edu/wcm/csc/pdfs/tentative_bs_schedule.pdf)

## Tentative 2 Year Schedule

**Computer Science Undergraduate Electives**

<table>
<thead>
<tr>
<th>Fall 2014</th>
<th>Spring 2015</th>
<th>Fall 2015</th>
<th>Spring 2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>152 Cryptography</td>
<td>159 Operating System Pragmatics</td>
<td>154 Comp Sys Attacks &amp; Countermeasures</td>
<td>153 Comp Forensics Principles &amp; Practice</td>
</tr>
<tr>
<td>154 Comp Sys Attacks &amp; Countermeasures</td>
<td>165 Comp Game Design &amp; Implementation</td>
<td>155 Adv Computer Graphics</td>
<td>159 Operating System Pragmatics</td>
</tr>
<tr>
<td>155 Adv Computer Graphics</td>
<td>171 Software Engr Proj Management</td>
<td>159 Operating System Pragmatics</td>
<td>165 Comp Game Design &amp; Implementation</td>
</tr>
<tr>
<td>159 Operating System Pragmatics</td>
<td>176 Advanced Database Management Systems</td>
<td>170 Software Specs</td>
<td>176 Advanced Database Management Systems</td>
</tr>
<tr>
<td>177 Data Warehousing and Data Mining</td>
<td>194 Computer Science Seminar</td>
<td>177 Data Warehousing and Data Mining</td>
<td>180 Intelligent Systems</td>
</tr>
<tr>
<td>179 Software Testing and Quality Assurance</td>
<td></td>
<td></td>
<td>194 Computer Science Seminar</td>
</tr>
</tbody>
</table>

**NOTE:** This is a planning document and not a guarantee that the schedule above will be followed. All lower and upper division core courses (CSC 15, 20, 28, 35, 60, 130-139), and 190, 191, 192, 195, 198, and 199 are offered every semester. Experimental courses (196’s) and new courses will be added as appropriate. Students with a GPA of 3.0 or better may want to consider taking some of the graduate elective courses offered.
Substitution-Waiver / Math Equivalency Forms

The substitution / waiver forms below are to be used for the following reasons:

- **Form A**: Use this form when non-articulated *Math* courses taken at another University need to be verified with the Math department. You will return the form to the CSC office and it will be placed in your student file.

- **Form B**: Use this form when non-articulated *CSC* courses taken at another University need to be verified with a CSC advisor. You will return the form to the CSC office and it will be placed in your student file.

- **Form C**: This form is to be used when making any changes to courses submitted on your graduation application. Example: you planned to take CSC 179 during Spring 2016 but decided to take CSC 152 instead. Additionally, after submitting Form A and/or Form B to the CSC office, the dept will complete Form C and forward to Admissions and Records to ensure the information is correctly reflected to your academic requirements.

---

**Form A**  
*California State University, Sacramento*  
Computer Science Department Math Course Equivalency Form

**Form B**  
*California State University, Sacramento*  
Computer Science Department Math Course Equivalency Form

**Form C**  
*California State University, Sacramento*  
Computer Science Department Math Course Equivalency Form
ADVISING AND FACULTY OFFICE HOURS

It is mandatory that you see a Computer Science faculty advisor at least once a year. Holds are placed on all CSC students; failure to do advising will result in being unable to register for courses.

Plan to visit your major advisor well BEFORE you attempt registration for the next semester, and get advising while classes are in session during Fall or Spring semesters. Faculty members are not available for advising during Finals Week, Winter Intersession, Spring Break or Summer Session.

(For GE advising, please go to the Academic Advising Center in Lassen Hall.)

❖ **Step 1**: Complete the "BS Advising Form" and "BS Course Planning form". The "BS Course Planning form" is a tentative plan for at least the next four semesters. Please fill out these forms prior to meeting with your assigned advisor.

- CONTINUING students should pick up their previous advising form in RVR 3018.

- NEW students (ie – this is your first year @ Sac State) should go to http://www.ecs.csus.edu/wcm/csc/forms.html and print the "BS Advising Form" and "BS Course Planning form".

❖ **Step 2**: Go see the faculty advisor assigned to you during their office hours. http://www.ecs.csus.edu/csc/ → Faculty Information → “Office Hours” link

Who is my advisor???
Example: if your last name is “SMITH” choose your advisor from Muyan-Ozcelik, Salem, Wang or Zhang (Q-Z block). If these advisors are not available, you can see someone else. The important thing to remember is to try and see the same professor (whomever you choose).

❖ **Step 3**: After your advisor signs the “BS Advising form”, return it to RVR 3018.

ATTENTION:
To remove any confusion, let’s clarify the advising policy for the Computer Science Department- According to the University Policy Manual, major advising is mandatory ONCE per academic year (so during Fall or Spring semester). Every semester **think Fall 2014**, the department places an advising hold on all CSC majors. Then dept staff goes through and removes the hold for everyone who did major advising the previous **Spring 2014** semester (because those students technically won’t require advising until the following year **Spring 2015**). The department then sends out a mass generic email to all CSC majors reminding them to do advising. The department encourages advising every semester, but if you know what you plan to take next semester, you are fine.

Please check your My SacState first. If you know that you completed major advising last semester, you should not have a hold on your record.
**ADVISING FORMS**

**Computer Science Department**  
**STUDENT ADVISING FORM**

Name:  
(Last) (First) (MI)  
Phone Number:  
(Cell) (Other)  
Email Address:  
Planned Graduation Date:  
Catalog Year of Major/Major:  
$3$ State ID #:  

This form must be returned to the dept office after every advising session. Without this form, your major registration hold will not be removed.

**Required Lower Division CSC Courses (18 units)**

<table>
<thead>
<tr>
<th>Course</th>
<th>Units</th>
<th>Sem</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSCI 10</td>
<td>3</td>
<td></td>
<td></td>
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<tr>
<td>CSCI 20</td>
<td>3</td>
<td></td>
<td></td>
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<tr>
<td>CSCI 25</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CSCI 35</td>
<td>2</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Required Math & Science Courses (21 units)**

<table>
<thead>
<tr>
<th>Course</th>
<th>Units</th>
<th>Sem</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>Math 2A</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Math 2B</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eng 110</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eng 210</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chem 1A</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Elect 1</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Elect 2</td>
<td>3</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Required Upper Division CSC Courses (30 units)**

<table>
<thead>
<tr>
<th>Course</th>
<th>Units</th>
<th>Sem</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSCI 120</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CSCI 130</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CSCI 135</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CSCI 150</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CSCI 191</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CSCI 195</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Elect 1</td>
<td>3 or 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Elect 2</td>
<td>5</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**CSCI upper Division Elective (9 units)**

<table>
<thead>
<tr>
<th>Course</th>
<th>Units</th>
<th>Sem</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSCI 220</td>
<td>3</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Other Courses Required for the Major**

<table>
<thead>
<tr>
<th>Course</th>
<th>Units</th>
<th>Sem</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phys 1A</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Elective 1</td>
<td>3</td>
<td></td>
<td></td>
</tr>
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</table>

**Progress Review**

<table>
<thead>
<tr>
<th>Advisor</th>
<th>GPA</th>
<th>Dept. notes</th>
</tr>
</thead>
</table>

*Required electives: Choose from CSCI 191, 195, 199, 219, 220, 229 or 239. One of: If CSCI 199 was taken as a 3-unit course and not independent study, it may be used as a CSCI Upper Division Elective instead.*

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**COURSE PLANNING FORM FOR NEXT FOUR SEMESTERS**

<table>
<thead>
<tr>
<th>Name:</th>
<th>SAC STATE ID:</th>
<th>Date:</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Sem/yr</th>
<th># Units</th>
<th></th>
<th>Sem/yr</th>
<th># Units</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
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</tbody>
</table>

# of hours per week you plan to work:

<table>
<thead>
<tr>
<th>Sem/yr</th>
<th># Units</th>
<th></th>
<th>Sem/yr</th>
<th># Units</th>
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</thead>
<tbody>
<tr>
<td></td>
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</tbody>
</table>

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<th># Units</th>
<th></th>
<th>Sem/yr</th>
<th># Units</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tr>
</tbody>
</table>

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Student: This form is in addition to, and is not to be used in lieu of, the advising form.

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Keep the tentative plan for yourself.
# GENERAL EDUCATION WORKSHEET

**General Education and Graduation Requirements Worksheet - Computer Science**

**Advisor:**

**Major:**

**Date:**

---

**Graduation Requirements:**

*Items numbered 1-4 must be taken in sequence*

**American Institutions:** U.S. History

- U.S. Constitution
- CA Government

1. College Composition I: GE A2
   - "C- or better required"

2. College Composition II: ENGLISH 20
   - "C- or better required"


4. Writing Intensive
   - "C- or better required"

- Foreign Language: Exempt
  - "C- or better required" ✓

- Race & Ethnicity in American Society

**Nine (9) units of Upper Division GE (#100-199):**

1. Upper Division GE Area (B-E)
2. Upper Division GE Area (B-E)
3. Upper Division GE Area (B-E) PHIL 103 ✓

120 units to graduate

40 units of upper division (#100-199)

Minimum 2.0 GPA required for: GE, Major, Minor coursework

Sac State GPA

Cumulative GPA

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**Conversion of Quarter Units to Semester Units:**

Quarter units x 2/3 = Semester units. For example: 90 quarters units x 2/3 = 60 semester units.

<table>
<thead>
<tr>
<th>Quarter Units</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Semester Units</td>
<td>1.3</td>
<td>2</td>
<td>2.6</td>
<td>3.3</td>
<td></td>
</tr>
</tbody>
</table>

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**General Education Requirements**

<table>
<thead>
<tr>
<th>A. Basic Subjects (9 units)</th>
<th>Course</th>
<th>Institution</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1. Oral Communication</td>
<td>&quot;C- or better required&quot;</td>
<td>COMS 4 (preferred) or COMS 5</td>
<td></td>
</tr>
<tr>
<td>A2. Written Communication</td>
<td>&quot;C- or better required&quot;</td>
<td>ENGL 1A</td>
<td></td>
</tr>
<tr>
<td>A3. Critical Thinking</td>
<td>&quot;C- or better required&quot;</td>
<td>ENGL 1C, JOUI 50, or PHYS 50</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>B. Physical Universe &amp; its Life Forms (12 units)</th>
<th>Course</th>
<th>Institution</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>B1. Physical Science</td>
<td>Met by major (PHYS 11A or 5A)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B2. Life Forms</td>
<td>RIOL 10 or ANTH 1 recommended</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B3. Lab</td>
<td>Met by major (PHYS 11A or 5A)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B4. Quantitative Reasoning</td>
<td>&quot;C- or better required&quot;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B5. Additional Course (Any B course to reach 12 units)</td>
<td>Met by major (MATH 30 or 26A)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>C. Arts &amp; Humanities (12 units)</th>
<th>Course</th>
<th>Institution</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1. Arts</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>C2. Humanities</td>
<td></td>
<td></td>
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<tr>
<td>Any Area A Course</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>D. The Individual &amp; Society (12 units)</th>
<th>Course</th>
<th>Institution</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Minimum of three subjects (e.g. ANTH, ECON, ETHN, GOVT, HIST, PPTA, etc.) must be taken in Area D.</em></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>U.S. History</td>
<td></td>
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<tr>
<td>U.S. Constitution and CA Government</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Any Area D Course</td>
<td>Met by major (PHIL 103)</td>
<td></td>
<td></td>
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<tr>
<td>Any Area D Course</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>E. Understanding Personal Development (3 units)</th>
<th>Course</th>
<th>Institution</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>KINS 99 must be taken CONCURRENTLY with any 1 unit KINS course for a total of 3 units.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td><strong>Fall 2014 Course Options</strong></td>
<td></td>
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</tr>
<tr>
<td>1.</td>
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<tr>
<td>2.</td>
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<tr>
<td>3.</td>
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<tr>
<td>4.</td>
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<tr>
<td>5.</td>
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<tr>
<td>6.</td>
<td></td>
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</tr>
</tbody>
</table>

**Spring 2015 Course Options**

1. 

2. 

3. 

4. 

5. 

6. 

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Website: [www.ecs.csus.edu/csc](http://www.ecs.csus.edu/csc)

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REGISTERING FOR CLASSES

Registering for Lecture/Lab Courses
Use “MY SAC STATE” to register (https://my.csus.edu). Check your schedule again just before you attend class – there are often last-minute changes to class schedules and the department may not be able to send an email beforehand.

Registration limits:
♦ Continued Probation: 14 units
♦ On academic contract: Maximum number of units allowed by your counselor
♦ Graduating Seniors: 21 units
♦ All others, during Priority Registration: in recent semesters, a “unit cap” has been placed on all students. Check your My Sac State to find out the unit limit.
♦ All others, during Late Registration: in recent semesters, a “unit cap” has been placed on all students. Check your My Sac State to find out the unit limit.
♦ To register for 21 or more units, obtain an “Excess Units Petition” at Admissions and Records in Lassen Hall.

If You Cannot Register Yourself Using “MY SAC STATE”...
The department enforces prerequisites. If you took a prerequisite at another institution, the course may not appear on your Sac State record yet and/or the registration system may not recognize that you have had the prerequisite. (There may also be a delay if you had to establish equivalency with a substitution/waiver form.) The department can register you if you submit a Registration Request Permit. If your request is approved, and there is still space in the course, the department will enroll you. If the course is full, you will be placed on the waitlist. (If the course is full AND the wait-list is full, you will likely have to try to add in person with the instructor on the first day of class. Once the semester begins, ALL add requests require instructor signature on the add permit.)

There could be another reason you are unable to register yourself – “My Sac State” won’t let you add an upper division course (CSc 133-191) if you are still a “pre-major.” In that case, the department can register you for upper division CSC courses if all requirements (except Change of Major form) are completed or if it is determined that you are likely to complete the requirements to become a full major by the end of the current semester. In addition to submitting the documents listed above, submit a Change of Major form. And please do your best to submit everything at the same time.

If you cannot enroll in a Math / Phys / History / Engl course, then you will need to contact the Math / Phys / History / Engl department, respectively. The CSC department can only enroll you in CSC courses.

Adding after Instruction Begins
♦ If the class is full, but the instructor has decided to let you in, have him/her sign the department’s registration permit, during the first 4 weeks of classes only. (Note: You may need to show the instructor evidence that you have passed the prerequisites.)
♦ Deliver the signed form to the department before the census date (the end of the fourth week of instruction). We will do our best to process it quickly, but it is your responsibility to check your schedule and make sure that you have been added to the class by the census date.
♦ Note: trying to add/drop AFTER the Census date requires the “Add/Drop petition” located on the University Registrar’s website, signatures of Instructor, Dept Chair AND College Dean, and written note from student explaining the late request.
use this form BEFORE Census date (the end of the 4th week of classes)
REGISTERING FOR SUPERVISED COURSES

Paperwork can be found at  http://www.ecs.csus.edu/wcm/csc/forms.html

CSc 195, Fieldwork in Computer Science

This is for someone who already has a job in the field that qualifies for academic credit.

♦ Read the guidelines “Fieldwork (Internship) Guidelines”.
♦ If you think you qualify, fill out the form, get your work supervisor’s signature, and turn it in to the department before the census date (the end of the fourth week of instruction). The department will enroll you.
♦ Note that you must turn in a written report and an evaluation by your workplace supervisor at the end of the semester in order to receive credit. See “Student Internship Report Guidelines” and “Supervisor Evaluation of Student Internship Form”
♦ Credit will only be given in the semester you are working. Example: if you are working during Summer break, you must register for CSC 195; you cannot work during the Summer and get credit during Fall semester.

CSc 195A-D, Professional Practice (Co-op)

If you do not already have a job that qualifies for fieldwork, and you want to be placed in a “Co-op” internship, please apply with the Career Counselor & Experiential Learning Coordinator in the Academic Advising and Career Center, Lassen Hall 1013. If you are accepted, the Co-op Counselor will contact the department staff directly to request you be enrolled.

CSc 198, Co-curricular Activities in Computer Science

Students will serve in leadership roles in computer science activities, provide tutoring or technical assistance in labs, assist instructors in grading coursework, or assist in other activities related to the subject matter and concerns of the department. Graded: Credit / No Credit.

Contact the department chair for more information.

CSc 199, Special Problems (Independent Study)

Individual projects or directed reading in specified topics in computer science. Note: Open only to students who appear competent to carry on individual work; approval of faculty supervisor and advisor required. May be repeated for credit. Graded: Credit / No Credit.

♦ Fill out a “Supervisory Course Petition” and have your faculty sponsor sign it. Deliver it to the department before the census date (the end of the fourth week of instruction). The department will enroll you.
DROPPING CLASSES

Dropping Before the Census Date (the end of the 4th week of class)

♦ Drop classes using “MY SAC STATE” ([https://my.csus.edu](https://my.csus.edu)) during the dates specified in Sacramento State Student’s Registration and Advising Handbook (available at the Bookstore), or as noted on the University’s website (Current Students – Student Registration & Advising).

♦ After online registration has closed, you can drop a class by filling out the department’s registration permit, getting the instructor’s signature, and delivering it to the department before the census date (the end of the fourth week of instruction).

♦ We will do our best to process it quickly, but it is your responsibility to check your schedule and make sure that you have been dropped from the class by the census date.

Dropping After the Census Date (the end of the 4th week of class)

♦ Use the campus form “Petition to Add/Drop After Deadline,” available in Lassen Hall, the department, or online at [http://www.csus.edu/registrar/forms/#update](http://www.csus.edu/registrar/forms/#update).

♦ Note that you must meet the requirements published on the form.

♦ Get the appropriate signatures and deliver the approved form to Admissions and Records in Lassen Hall. The department will **not** send it for you.

Withdrawing From All Courses

♦ If you must withdraw from all classes, do not use drop forms.

♦ Use an official withdrawal form available in the Academic Advising Center, Lassen Hall 1013. Call (916) 278-6351 if you have questions.

Refunds

♦ Refer to the Sacramento State Student Financial Services Center ([http://www.csus.edu/sfsc-fees-deadlines-refunds.html](http://www.csus.edu/sfsc-fees-deadlines-refunds.html)) for information.
PETITION TO ADD/DROP AFTER DEADLINE

<table>
<thead>
<tr>
<th>NAME</th>
<th>STUDENT ID NUMBER</th>
</tr>
</thead>
<tbody>
<tr>
<td>Last</td>
<td>First</td>
</tr>
<tr>
<td>ADDRESS</td>
<td>CITY</td>
</tr>
<tr>
<td>DAY OR PHONE MESSAGE</td>
<td>EMAIL</td>
</tr>
</tbody>
</table>

1. Read the University add and drop policies on the back of this form. A $10 late fee (check/money order only) applies to add transactions completed after the fourth week of instruction.
2. The accuracy of your registration is your responsibility. You must obtain necessary signatures and deliver the signed form to the proper offices.
3. Write or type your reasons for requesting a late add and drop on a separate page, and attach with documentation to the signed petition.
4. Use a separate form for each academic department.
5. Verify the accuracy of your classes by checking "My Sac State" (https://www.my.csue.edu) or at the Admissions and Records Office.

### ADD THIS COURSE

<table>
<thead>
<tr>
<th>5-DIGIT CLS NO</th>
<th>DEPT CAT NO</th>
<th>INSTRUCTOR</th>
<th>SIGNATURE</th>
<th>DATE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>DEPARTMENT CHAIR</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>(required after 2nd week of semester)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>COLLEGE DEAN</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>(required after 4th week of semester)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>VICE-PRESIDENT'S DESIGNEE</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Registrar's Office, 1st Floor Lobby (required after 4th week of semester)</td>
<td></td>
</tr>
</tbody>
</table>

### DROP THIS COURSE

<table>
<thead>
<tr>
<th>5-DIGIT CLS NO</th>
<th>DEPT CAT NO</th>
<th>INSTRUCTOR</th>
<th>SIGNATURE</th>
<th>DATE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<table>
<thead>
<tr>
<th>DEPARTMENT CHAIR</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>(required after 2nd week of semester)</td>
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<table>
<thead>
<tr>
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<th>Date</th>
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<tbody>
<tr>
<td>(required after 4th week of semester)</td>
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</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>DEPARTMENT OFFICE</th>
<th>Initials</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>(dropped: Initials)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

OFFICE USE ONLY

- Class added: Initials | Date
- Class not added: Initials | Date
- Reason: |

### ADD POLICY:

- Students are expected to add/drop courses using "My Sac State" (https://www.my.csue.edu) until the end of the second week of the semester. Additions to the schedule must be made using an add/drop form available from the academic department.
- Late additions may result in expulsion from the course. Additions approved for serious and compelling reasons by the instructor and department chair.
- Write your reasons for late addition request on a separate page and attach to this petition along with verification of the circumstances. Submit the petition to the academic dean.
- Additions approved after the second week will be processed (unless students present evidence of University error that prevented their timely action). Write your reasons for late addition request on a separate page and attach to this petition along with verification of the circumstances. Submit the petition to the academic dean.
- Additions approved after the second week will be processed (unless students present evidence of University error that prevented their timely action). Write your reasons for late addition request on a separate page and attach to this petition along with verification of the circumstances. Submit the petition to the academic dean.
- Additions approved after the second week will be processed (unless students present evidence of University error that prevented their timely action). Write your reasons for late addition request on a separate page and attach to this petition along with verification of the circumstances. Submit the petition to the academic dean.

### DROP POLICY:

Although instructors may exercise their authority to administratively remove any student who fails to attend during the first two weeks of instruction, students should not assume they will be dropped. Students will receive a final grade of "F" or "WF" in courses they fail to drop officially.

- Until the end of the second week of instruction each semester, students are expected to drop courses using "My Sac State" (https://www.my.csue.edu). Students will be charged registration fees for all courses not dropped by this deadline.
- After the second week of instruction, drops are permitted only for serious and compelling reasons. Drops during the thirteenth through the sixteenth week require the signatures of the course instructor and the department chair. Submit drop petitions to the Registrar's Office after the fourth week. Drops after the fourth week of instruction will result in a "WF" grade. Reasons for dropping include medical, carrying an excessive course load, a student's inadequate academic preparation for the course, or the student having significant job or career changes.
- After the sixteenth week of the semester, no drops require the approval of the course instructor, department chair, and the college dean. Drops will be permitted only for medical or career-related reasons beyond the control of the student and must be verified in writing by a doctor or employer. A student-initiated job change does not qualify.
- No drops are allowed after the last week of instruction.

Website: www.ecs.csus.edu/csc
REPEATING COURSES

INCOMPLETE GRADES AND REPEAT POLICY CHANGES EFFECTIVE FALL 2010.

♦ Students may not repeat courses where an “I” grade has been previously assigned unless the “I” grade has lapsed or a grade of “C-” or lower has been assigned
♦ Students may not repeat courses where a grade of “C” or higher was previously received unless the course may be taken more than once for credit
♦ Students will be prevented from enrolling in a course where the grade previously earned is a “C” or better (or Credit).
♦ Students may repeat a maximum of 16 units for grade forgiveness
♦ Courses taken prior to Fall 2010 will not count towards the 16 units of grade forgiveness
♦ Students may repeat an individual course for grade forgiveness no more than two times without review and written approval by your academic advisor and/or department chair.
♦ Students may repeat an additional 12 units for grade average beyond the 16 units of forgiveness

The new Repeat Policy is applicable to all undergraduate students and applies only to courses taken at Sacramento State. Please note that students will be blocked at registration from attempting to enroll in courses where a grade of “I” or “C” or higher has been received.

The Repeat Exception Petition (http://www.csus.edu/registrar/forms/) is to be used by students asking for an exception to the new repeat policy which prohibits students from repeating “C” or better grades or repeating a class more than two times.

♦ In the case of multiple repeats (including other institutions), University policy dictates that the third time you take the course, all attempts (and all subsequent attempts) will be averaged together in your GPA calculation.
DELETING, ADDING, OR APPEALING A GRADE

DELETING A GRADE

♦ If this is the first semester you have received a “WU” (Unauthorized Withdrawal), you may be able to delete the grade. The “WU” may be assigned in the case where the student has not completed sufficient course assignments or participated in sufficient course activity to make it possible, in the opinion of the instructor, to report satisfactory or unsatisfactory completion of the class by use of a letter grade (A - F).
♦ Fill out a “First Semester ‘WU’ Grade Deletion Petition”, available from Admissions and Records in Lassen Hall or online (http://www.csus.edu/registrar/forms/).
♦ The University may also grant a deletion of a failing grade if you have documentation of a serious medical condition which interfered with your completion of the course. Fill out an “Academic Standards Committee - Deletion of Grade Petition”, available from Student Service Counter (Lassen Hall, first floor Lobby).

ADDING A GRADE

If you attended class but neglected to register for it, and you paid sufficient fees to cover the class, you may be able to have it added to your record.
♦ Fill out an “Academic Standards Committee - Special Consideration Petition,” available from Admissions and Records in Lassen Hall.
♦ Obtain the signatures of the instructor of record and the department chair.
♦ Return the form to Admissions and Records.

APPEALING A GRADE

♦ The official University student grade appeal process is described on the web at: http://www.csus.edu/umanual/Acad%20Affairs/Grade_Appeal_Policy.htm
♦ Read and follow instructions carefully, or you may lose the right to an appeal. Grade appeals must be started within three weeks of the semester following the one in which you received the grade!
♦ Be prepared to submit the originals of all of your graded work with your appeal paperwork.
GRADUATION

HOW TO SUBMIT YOUR GRADUATION APPLICATION

Bachelor’s graduation applications are due approximately one year before your projected graduation date (October 1st for Spring or Summer graduation, Feb 1st for Fall graduation).

The Computer Science department is part of a group of majors that complete the graduation application online. Please visit the following link for the most up-to-date information: http://www.csus.edu/registrar/Graduation/graduate_online.html

Other useful graduation links:
  ✓ General Commencement information: http://www.csus.edu/commencement/
  ✓ The Graduation Channel: http://www.csus.edu/graduationchannel/

HOW TO UPDATE YOUR APPLICATION AFTER FILING

After you have filed your application, submit an official Sacramento State “Major/Minor Course Substitution and Waiver” Form (http://www.csus.edu/registrar/forms/#eval) if any of the following occurs:
♦ You need to change your electives
♦ You want to substitute a course from another institution

AND/OR
♦ If you need to change your graduation date, you must complete the “Bachelor’s Degree Date Change Form”

Note: After the form has been approved by the Chair or Associate Chair, you must return it to Admissions and Records yourself.

ATTENDING THE COMMENCEMENT CEREMONY

♦ Your name will be in the printed program if you file your graduation petition by the publicized deadline.
♦ General Commencement information: http://www.csus.edu/commencement/
♦ If you wish to have your name read aloud during the ceremony, sign up in the Dean’s Office (RVR 2014) at least one week before. Information is also available at http://www.ecs.csus.edu/index.php?content=graduation.
♦ Note: You may walk in the Commencement Ceremony even if you have not fulfilled all your requirements to graduate yet.
APPENDIX I: Policy on Academic Integrity

Computer Science students are required to adhere to University guidelines for academic integrity. These guidelines are outlined in the CSUS University Policy Manual on Academic Honesty, available at http://www.csus.edu/umanual/student/STU-0100.htm.

Definitions of Academic Dishonesty

Cheating. At Sacramento State, cheating is the act of obtaining or attempting to obtain credit for academic work through the use of any dishonest, deceptive, or fraudulent means. Cheating at Sacramento State includes but is not limited to:

- Copying, in part or in whole, from another's test or other evaluation instrument.
- Using crib notes, "cheat sheets," or any other device, including electronic devices not permitted by the instructor as an aid in writing an examination.
- Submitting work previously graded in another course unless doing so has been approved by the course instructor or by department policy.
- Submitting work simultaneously presented in more than one course, unless doing so has been approved by the respective course instructors or by the department policies of the respective departments.
- Altering or interfering with grading or grading instructions.
- Sitting for an examination by a surrogate, or as a surrogate.
- Any other act committed by a student in the course of his or her academic work that defrauds or misrepresents, including aiding or abetting in any of the actions defined above.

Plagiarism. Plagiarism, as a form of cheating, is the use of distinctive ideas or works belonging to another person without providing adequate acknowledgement of that person’s contribution. Regardless of the means of appropriation, incorporation of another’s work into one’s own requires adequate identification and acknowledgement. Plagiarism is doubly unethical because it deprives the author of rightful credit and gives credit to someone who has not earned it. Acknowledgement is not necessary when the material used is common knowledge. Plagiarism at Sacramento State includes but is not limited to:

- The act of incorporating into one's own work the ideas, words, sentences, paragraphs, or parts thereof, or the specific substance of another's work without giving appropriate credit thereby representing the product as entirely one's own. Examples include not only word-for-word copying, but also the "mosaic" (i.e., interspersing a few of one's own words while, in essence, copying another's work), the paraphrase (i.e., rewriting another's work while still using the other's fundamental idea or theory); fabrication (i.e., inventing or counterfeiting sources), ghost-writing (i.e., submitting another's work as one's own) and failure to include quotation marks on material that is otherwise acknowledged; and
- Representing as one's own another's artistic or scholarly works such as musical compositions, computer programs, photographs, paintings, drawing, sculptures, or similar works.
APPENDIX II: IMPORTANT COMPUTER SCIENCE ACCOUNTS

➤ Every CSUS student should set up a SacLink account with the University. This account will provide you with, among other things, free E-mail and Internet access to “MY SAC STATE” (https://my.csus.edu). This can be done via the Internet at: https://www.saclink.csus.edu/.

➤ Are you signed up for the “CSCUNDERGRADLIST”? We will only use it to warn you of advising holds and announce special events and job opportunities.

➤ As a Computer Science student, you may also want to set up an ECS network account with the College of Engineering and Computer Science (ECS) Computing Services. You can do this via the Internet:

1. Go to: http://www.ecs.csus.edu/
2. Under “Tech Tools”
3. Select ECS Accounts
4. Follow the instructions to get a new Windows/UNIX account

Note: If you have an ECS student network account, you can also get Microsoft software at little or no cost through the MSDN Academic Alliance, a program subscribed to by the College of Engineering and Computer Science. (http://www.ecs.csus.edu/computing/helpdesk.php and follow the “Login to MSDN Academic Alliance” link).