Who is Computer Science at Chico State?

Computer Science at Chico State is defined by its faculty, students, and alumni.

We are Faculty

We faculty in the Department of Computer Science feel strongly about being actively involved in your education. Our classes are taught by us, the faculty, not by assistants. We are also constantly assessing and updating our curriculum to ensure it reflects not only the "science" underlying computer science, but also the current and emerging technologies that our computer science and computer information systems graduates develop and use. This drive for currency is reflected in our research in areas such as security, data science, computer vision, robotics, bioinformatics, and quantum computing. We invite you to contact us, come for a visit, and apply. We love what we do. Let us to share our enthusiasm with you and help you discover the same passion we and our students share for computer science.

We are Students

We students are not nameless faces in a classroom. Computer science professors develop a more personal relationship with us. And the assigned projects have character; they are remarkably effective at demystifying computer technology. We also know that the portrayal of computer science as a solitary endeavor pursued by social misfits is entirely wrong. At Chico State we have found computer science to be a uniquely human experience. Engineering software is the effort of many people working together, solving large, difficult, captivating problems. Social interaction embodies the student culture here at Chico State.

And the support—help is everywhere. Student tutors are available most times during the day and faculty office hours are plentiful. Study groups are the norm, and there are numerous clubs to join. The most remarkable aspect of being a student in Chico State's Computer Science Department is how friendly and sociable everyone is. Everyone wants you to succeed. We students spend a lot of time with each other. We work well together and are establishing lasting friendships. We even created our own Computer Science Discord server where someone is always available to help when working through difficult material.

We are Alumni

We alumni find ourselves returning to the Computer Science Department from which we graduated. We come to hire the new graduates into the companies we now work for, knowing they have the same preparation that put us on a path to success. We serve on the department's Industry Advisory Board, ensuring the program's continued strength and relevance. We even visit the student's Discord server to reminisce and help the occasional student who wanders into our conversation with a question.

"I found a job within a couple months of graduating. The education enables one to speak fluently about many computer science topics, and the clubs enable one to tackle and practice myriad problem-solving skills for the technical aspects of interviews. The education provides real opportunity that I am thankful for. As well as what I hope are lifelong friends, in both faculty and alumni." —Stephen Anderson (Computer Science, '21)

"I got a FAANG¹ internship during my rising senior summer. With my practical experience from Chico State classes and professors I was able to execute well during my internship and received a full-time return offer. After some experience at my first company, I used my class assignments to prep for another FAANG company, which I was given an offer that I took. I consistently stack up and over-perform against fellows from Ivy Leagues and other tech colleges, and all of this from a college that I was able to graduate from without taking out loans." —James Krepelka (Computer Science, '15)

¹ FAANG: prominent technology companies Facebook, Amazon, Apple, Netflix, and Google

Programs

Undergraduate

Bachelor's

• Computer Information Systems BS (https://catalog.csuchico.edu/colleges-departments/college-engineering-computer-science-construction-management/computer-science/computer-information-systems-bs/)

• Computer Science BS (https://catalog.csuchico.edu/colleges-departments/college-engineering-computer-science-construction-management/computer-science/computer-science-bs/)

Minors

• Computer Science Minor (https://catalog.csuchico.edu/colleges-departments/college-engineering-computer-science-construction-management/computer-science/computer-science-minor/)

Certificates

• Data Science Certificate (https://catalog.csuchico.edu/colleges-departments/college-engineering-computer-science-construction-management/computer-science/data-science-certificate/)

Graduate

Master's

• Computer Science MS (https://catalog.csuchico.edu/colleges-departments/college-engineering-computer-science-construction-management/computer-science/computer-science-ms/)

See Course Description Symbols and Terms (https://catalog.csuchico.edu/academic-standards-policies/course-description-symbols-terms/) for an explanation of course description terminology and symbols, the course numbering system, and course credit units.
# Computer Information Systems

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Units</th>
<th>Offered</th>
<th>Prerequisite</th>
<th>Course Attributes</th>
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<tbody>
<tr>
<td>CINS 220</td>
<td>PCs and Peripherals</td>
<td>3</td>
<td>Fall and spring</td>
<td>CSCI 111 with a grade of C or higher</td>
<td>Upper Division</td>
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<tr>
<td>CINS 242</td>
<td>Information Systems Design</td>
<td>3</td>
<td>Fall only</td>
<td>CSCI 211; CSCI 217 or MATH 217, both with a grade of C or higher</td>
<td>Upper Division</td>
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<td>CINS 370</td>
<td>Introduction to Databases</td>
<td>3</td>
<td>Fall and spring</td>
<td>CSCI 211; CSCI 217 or MATH 217, both with a grade of C or higher</td>
<td>Upper Division</td>
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<tr>
<td>CINS 448</td>
<td>Computer Security</td>
<td>3</td>
<td>Fall and spring</td>
<td>CSCI 211; CINS 220, CSCI 221 or EECE 237, all with a grade of C or higher</td>
<td>Upper Division</td>
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<tr>
<td>CINS 465</td>
<td>Advanced Computer Security</td>
<td>3</td>
<td>Fall only</td>
<td>CINS 448 with a grade of C or higher</td>
<td>Upper Division</td>
</tr>
</tbody>
</table>

Typically Offered:
- Fall and spring

Prerequisite:
- You may take this course for a maximum of 3 units

Course Attributes:
- Lower Division

Graded
CINS 570  Advanced Database Management Systems  3 Units
Prerequisite: CINS 370 with a grade of C or higher or MINS 335.
Typically Offered: Fall only
Course topics include database application programming using a high
performance, high concurrency multi-user database management
system. This course covers the SQL programming language including
Data Definition Language, Data Manipulation Language, and Data
Control Language. The course then focuses on a procedural database
programming language including control structures, composite
datatypes, explicit cursors, exception handling, and writing embedded
SQL applications. 2 hours activity, 2 hours discussion. (002381)
Grade Basis: Graded
Repeatability: You may take this course for a maximum of 3 units
Course Attributes: Upper Division

Computer Science

CSCI 101  Introduction to Computer Science  3 Units
Typically Offered: Fall and spring
Students who have had limited experience with computers should
take CSCI 101 before CSCI 111. CSCI 101 provides an overview of
the fundamentals of computer science. Number systems and data
representation are introduced. An overview of hardware, including the
control unit, memory, the ALU, and I/O is provided. Software is introduced
with an overview of operating systems, programming languages,
applications, and software tools. Students are exposed to common
operating systems and applications. Student also design and implement
several programs. 2 hours activity, 2 hours discussion. (002280)
Grade Basis: Graded
Repeatability: You may take this course for a maximum of 3 units
Course Attributes: Lower Division

CSCI 102  Living With Technology  3 Units GE
Typically Offered: Fall and spring
This course explores the impact of technology on our lives. Aspects
of our complex technological society are investigated through study
of the various forms technology takes, and readings in contemporary
literature regarding the impact these technologies have on individuals.
Students are encouraged to reflect on technology in their own lives
through journaling, and to discourse with their peers on the benefits
and harm to individuals, society, and humanity that modern technology
presents. 3 hours discussion. (020623)
General Education: Lifelong Learning and Self-Development (E)
Grade Basis: Graded
Repeatability: You may take this course for a maximum of 3 units
Course Attributes: Lower Division; Sustainable Course

CSCI 111  Programming and Algorithms I  4 Units
Prerequisite: GE Mathematics/Quantitative Reasoning (B4) requirement;
MATH 119 (or completion of high school precalculus), MATH 120, or
meet the Math department's requirements for enrollment in MATH 120.
Recommended: CSCI 217 or MATH 217 (may be taken concurrently).
Typically Offered: Fall and spring
A first-semester programming course, providing an overview of computer
systems and an introduction to problem solving and software design
using procedural object-oriented programming languages. Coverage
includes the software life cycle, as well as algorithms and their role in
software design. Students are expected to design, implement, and test a
number of programs. 2 hours activity, 3 hours lecture. (002281)
Grade Basis: Graded
Repeatability: You may take this course for a maximum of 4 units
Course Attributes: Lower Division

CSCI 198  Special Topics  1-3 Units
Prerequisite: Department permission.
Typically Offered: Fall and spring
This course is for special topics offered for 1.0-3.0 units. Typically the
topic is offered on a one-time-only basis and may vary from term to term
and be different for different sections. See the Class Schedule for the
specific topic being offered. 3 hours supervision. (002307)
Grade Basis: Graded
Repeatability: You may take this course more than once
Course Attributes: Lower Division

CSCI 199  Special Problems  1-3 Units
Prerequisite: Faculty permission.
Typically Offered: Fall and spring
This course is a special topic offered for 1.0-3.0 units. You must
register directly with a supervising faculty member. 0 hours
supervision. (021848)
Grade Basis: Credit/No Credit
Repeatability: You may take this course for a maximum of 6 units
Course Attributes: Lower Division

CSCI 211  Programming and Algorithms II  4 Units
Prerequisite: GE Mathematics/Quantitative Reasoning (B4) requirement;
CSCI 111 with a grade of C or higher. Recommended: CSCI 217 or
MATH 217 (may be taken concurrently).
Typically Offered: Fall and spring
A second semester object-oriented programming course in computer
science that emphasizes problem solving. This course continues the
study of software specification, design, implementation, and debugging
techniques while introducing abstract data types, fundamental data
structures and associated algorithms. Coverage includes dynamic
memory, file I/O, linked lists, stacks, queues, trees, recursion, and an
introduction to the complexity of algorithms. Students are expected to
design, implement, test, and analyze a number of programs. 2 hours
activity, 3 hours lecture. (002282)
Grade Basis: Graded
Repeatability: You may take this course for a maximum of 4 units
Course Attributes: Lower Division

CSCI 217  Discrete Mathematics  3 Units
Prerequisite: GE Mathematics/Quantitative Reasoning Ready, CSCI 111
with a grade of C or higher (may be taken concurrently), MATH 119 (or
equivalent).
Typically Offered: Fall and spring
Offers an intensive introduction to discrete mathematics as used in
computer science. Topics include sets, relations, propositional and
predicate logic, basic proof methods including mathematical induction,
digital logic circuits, complexity of algorithms, elementary combinatorics,
and solving linear recurrence relations. 3 hours discussion. (005550)
Cross listing(s): MATH 217
Grade Basis: Graded
Repeatability: You may take this course for a maximum of 3 units
Course Attributes: Lower Division

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CSCI 221  Assembly Language Programming  3 Units
Prerequisite: CSCI 211 with a grade of C or higher. CSCI 217 or MATH 217 recommended.
Typically Offered: Inquire at department
Topics include number systems and their rules for arithmetic; basic central processing unit (CPU) organization concepts such as registers, data paths, the arithmetic and logic unit (ALU) and the interface to random access memory (RAM); instruction formats, addressing modes and their uses with a variety of data structures; and parameter passing techniques including the use of a stack frame. The use of good programming methodologies to develop and document algorithms at the assembly language level is emphasized. 2 hours activity, 2 hours lecture. (002290)
Grade Basis: Graded
Repeatability: You may take this course for a maximum of 3 units
Course Attributes: Lower Division

CSCI 300  Computer Science Seminar  1 Unit
Prerequisite: CSCI 211 with a grade of C or higher.
Typically Offered: Fall and spring
This course exposes students to computer science topics not normally covered in the computer science curriculum. Guest speakers include faculty (including from other departments), students, alumni, and members of the computing industry. Topics include current computer science research and software development issues. Specific topics may include software development tools, bioinformatics, human computer interaction, security, machine learning, specific corporate approaches to software development, dev-ops, software job interviews, programming languages, simulation, graphics, game development, web and mobile applications, cloud computing, and networks. 1 hour lecture. (021889)
Grade Basis: Credit/No Credit
Repeatability: You may take this course for a maximum of 3 units
Course Attributes: Upper Division

CSCI 301W  Computer's Impact on Society (W)  3 Units, W, GW
Prerequisite: GE Written Communication (A2) requirement; Junior standing.
Typically Offered: Fall and spring
Impact of computers and high-tech systems on people, institutions, organizations, and environment. Examines the following: law, medicine, education, government, data banks, privacy, computer security, changing work, automation, robots, expert systems, AI, social responsibility, ethics, war, conflict resolution. Includes weekly reading, midterm, and final writing projects. Weekly lectures, discussions, films, and writing. No programming. 3 hours discussion. (002309)
Grade Basis: Graded
Repeatability: You may take this course for a maximum of 3 units
Course Attributes: Upper Division; Writing Course; Graduation Writing Assessment

CSCI 310  Programming Foundations  6 Units
Prerequisite: Graduate Standing.
Typically Offered: Fall only
An accelerated object-oriented programming course that prepares students without sufficient undergraduate preparation for the graduate program in computer science. Coverage includes software specification, design, implementation, debugging techniques, dynamic memory, I/O, linked lists, stacks, queues, recursion, trees, search structures, hashing, heaps, sorting algorithms, graph algorithms, and an introduction to the complexity of algorithms. Foundational data structures and algorithms are studied and analyzed using both mathematical and empirical measurements. The course includes a number of large programming assignments focusing on object-oriented software engineering and algorithm development. 2 hours activity, 5 hours lecture. (022021)
Grade Basis: Graded
Repeatability: You may take this course for a maximum of 6 units
Course Attributes: Upper Division

CSCI 311  Algorithms and Data Structures  4 Units
Prerequisite: CSCI 211 with a grade of C or higher; CSCI 217 or MATH 217 with a grade of C or higher.
Typically Offered: Fall and spring
This course focuses on object-oriented methodologies in designing and implementing a variety of data structures and algorithms. Coverage includes recursion, trees, search structures, hashing, heaps, sorting algorithms, and graph algorithms. Data structure and algorithm combinations will be studied and analyzed along with their relative merits using both mathematical and empirical measurements. The course includes a number of large programming assignments focusing on object-oriented software engineering and algorithm development. Students will be required to design, implement, test, and analyze their programs in at least one object-oriented language. 2 hours activity, 3 hours lecture. (002325)
Grade Basis: Graded
Repeatability: You may take this course for a maximum of 4 units
Course Attributes: Upper Division

CSCI 315  Programming Languages  3 Units
Prerequisite: CSCI 311 with a grade of C or higher.
Typically Offered: Spring only
An investigation into the structure and syntax of current programming languages, including binding, scoping, data types, transfer-of-control structures, subprograms, abstract data types, object-oriented programming, and logical and functional programming. 3 hours discussion. (002323)
Grade Basis: Graded
Repeatability: You may take this course for a maximum of 3 units
Course Attributes: Upper Division
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<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
<th>Credit/No Credit</th>
<th>Typically Offered</th>
<th>Prerequisite</th>
<th>Grade Basis</th>
<th>Repeatability</th>
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<tr>
<td>CSCI 344</td>
<td>Shell Programming</td>
<td>3 Units</td>
<td>Grade Basis</td>
<td>Upper Division</td>
<td>CSCI 211 with a grade of C or higher; CSCI 217 or MATH 217 with a grade of C or higher.</td>
<td>Graded</td>
<td>You may take this course for a maximum of 3 units</td>
<td>Upper Division</td>
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<tr>
<td>CSCI 345</td>
<td>Linux System Administration</td>
<td>3 Units</td>
<td>Grade Basis</td>
<td>Upper Division</td>
<td>CSCI 211 with a grade of C or higher; CSCI 217 or MATH 217 with a grade of C or higher.</td>
<td>Graded</td>
<td>You may take this course for a maximum of 3 units</td>
<td>Upper Division</td>
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<td>CSCI 385</td>
<td>Introduction to Data Science</td>
<td>3 Units</td>
<td>Grade Basis</td>
<td>Upper Division</td>
<td>CSCI 111, MATH 130, or MATH 230; MATH 109 or MATH 120.</td>
<td>Graded</td>
<td>You may take this course for a maximum of 3 units</td>
<td>Upper Division</td>
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<td>CSCI 389</td>
<td>Industry Internship</td>
<td>1-3 Units</td>
<td>Credit/No Credit</td>
<td>Upper Division</td>
<td>Department permission.</td>
<td>Credit/No Credit</td>
<td>You may take this course for a maximum of 15 units</td>
<td>Upper Division; Laptop required</td>
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<td>CSCI 398</td>
<td>Special Topics</td>
<td>1-3 Units</td>
<td>Grade Basis</td>
<td>Upper Division</td>
<td>Department permission.</td>
<td>Graded</td>
<td>You may take this course for a maximum of 3 units</td>
<td>Upper Division</td>
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<tr>
<td>CSCI 399</td>
<td>Special Problems</td>
<td>1-3 Units</td>
<td>Grade Basis</td>
<td>Upper Division</td>
<td>Faculty permission.</td>
<td>Graded</td>
<td>You may take this course more than once</td>
<td>Upper Division</td>
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<tr>
<td>CSCI 411</td>
<td>Advanced Algorithms and Complexity</td>
<td>4 Units</td>
<td>Grade Basis</td>
<td>Upper Division</td>
<td>CSCI 311 with a grade of C or higher.</td>
<td>Graded</td>
<td>You may take this course for a maximum of 6 units</td>
<td>Upper Division</td>
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<tr>
<td>CSCI 420</td>
<td>Applied Quantum Computing for Computer Scientists</td>
<td>3 Units</td>
<td>Grade Basis</td>
<td>Upper Division</td>
<td>CSCI 311 with a grade of C or higher; MATH 109, MATH 120, or MATH 315.</td>
<td>Graded</td>
<td>You may take this course for a maximum of 4 units</td>
<td>Upper Division</td>
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<td>Course Code</td>
<td>Course Title</td>
<td>Units</td>
<td>Typically Offered</td>
<td>Prerequisite:</td>
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<td>CSCI 430</td>
<td>Software Engineering</td>
<td>3</td>
<td>Fall and spring</td>
<td>CSCI 311 with a grade of C or higher.</td>
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<td>Typically Offered: Fall and spring An overview of software engineering principles, practice, and tools. Topics include: agile software engineering methodologies, requirements engineering, test-driven development, software design patterns, MVC architecture, version control, software metrics, and static analysis. Students work in groups to design and implement a semester-long open source software project. 2 hours activity, 2 hours discussion. (002310)</td>
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<td>Repeatability: You may take this course for a maximum of 3 units</td>
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<td>Course Attributes: Upper Division</td>
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<td>CSCI 431W</td>
<td>Usability Engineering (W)</td>
<td>3</td>
<td>Fall and spring</td>
<td>GE Oral Communication (A1); GE Written Communication (A2); GE Critical Thinking (A3); GE Mathematics/Quantitative Reasoning (B4) requirements, or consent of the instructor.</td>
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<td>Typically Offered: Fall and spring Usability Engineering is the craft of designing and evaluating how people interact with products and technology. In this course, students learn qualitative and quantitative methods for conducting behavioral research to investigate human-computer interaction (HCI) and to iteratively improve user experience (UX) design of digital interfaces. Students engage in team projects and conduct user research to design, evaluate and revise interactive prototypes following the user-centered design process. 2 hours activity, 2 hours discussion. (020615)</td>
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<td>General Education: Upper-Division Social Sciences (UDD); Innovation, Design, and the Arts Pathway</td>
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<tr>
<td>CSCI 440</td>
<td>Operating Systems</td>
<td>4</td>
<td>Fall and spring</td>
<td>CSCI 221 or EECE 237; CSCI 311 all with a grade of C or higher.</td>
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<td>Typically Offered: Fall and spring Operating system fundamentals, including history, process and thread management, concurrency with semaphores and monitors, deadlocks, storage management, file systems, I/O, and distributed systems. 2 hours activity, 3 hours discussion. (002288)</td>
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<tr>
<td>CSCI 446</td>
<td>Introduction to Computer Networks and Network</td>
<td>3</td>
<td>Fall and spring</td>
<td>CSCI 211; CINS 220, CSCI 221, or EECE 237 all with a grade of C or higher.</td>
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<td>Management</td>
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<td>Typically Offered: Fall and spring This course is an introduction to basic networking technologies and network management concepts, including major network operating systems, communication architecture focusing on ISO and Internet models with discussion of current standards and protocols. Significant laboratory work using current networking equipment reinforces lectures and provides fundamental experience with router and switch management. 3 hours laboratory, 2 hours lecture. (002340)</td>
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<td>Cross listing(s): EECE 446</td>
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<td>CSCI 485</td>
<td>Advanced Topics in Data Science</td>
<td>3</td>
<td>Fall and spring</td>
<td>CSCI 385 or MATH 385; MATH 456 (may be taken concurrently).</td>
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<td>Typically Offered: Spring only Getting connected to current events in Data Science and building an online presence. Ethics of predictive analytics and privacy and open data. Reporting and dissemination of research using interactive dashboards and web-publishing. Introduction to current scalable technologies to handle Big Data. Introduction to advanced statistical analysis and machine learning techniques for Data Science. 3 hours lecture. (021890)</td>
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<td>Repeatability: You may take this course for a maximum of 3 units</td>
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<td>Course Attributes: Upper Division</td>
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<tr>
<td>CSCI 490</td>
<td>Computer Science Capstone</td>
<td>3</td>
<td>Fall and spring</td>
<td>CSCI 430; CINS 465, CINS 467, or MATH 485; Senior Standing.</td>
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<td>Typically Offered: Fall and spring This capstone course provides a culminating activity in computer science. Students will work independently to specify, design, develop, test, and document a complete software application under faculty supervision. Students present status reports at weekly meetings, and present their finished project at the end of the semester. 9 hours supervision. (002343)</td>
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<td>Grade Basis: Report in Progress: Graded</td>
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<td>Repeatability: You may take this course for a maximum of 3 units</td>
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<td>Course Attributes: Upper Division</td>
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<td>CSCI 498</td>
<td>Topics in Computer Science</td>
<td>1-3</td>
<td>Fall and spring</td>
<td>CSCI 385 or MATH 385; MATH 456 (may be taken concurrently).</td>
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<td>Typically Offered: Inquire at department This course is a special topic offered for 1.0-3.0 units. Exploration of selected topics in Computer Science. Consult semester schedules for specific listings. Standard letter grading only. 3 hours discussion. (002389)</td>
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<td>Grade Basis: Graded</td>
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<td>Repeatability: You may take this course more than once</td>
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<td>Course Attributes: Upper Division</td>
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<td>CSCI 499</td>
<td>Special Problems</td>
<td>1-3</td>
<td>Fall and spring</td>
<td>Faculty permission.</td>
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<td>Typically Offered: Fall and spring This course is an independent study of special problems offered for 1.0-3.0 units. You must register directly with a supervising faculty member. 3 hours supervision. (002390)</td>
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<td>Grade Basis: Credit/No Credit</td>
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<td>Repeatability: You may take this course for a maximum of 6 units</td>
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<td>Course Attributes: Upper Division</td>
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<td>CSCI 499H</td>
<td>Honors Research Project/Thesis</td>
<td>3</td>
<td>Fall and spring</td>
<td>Acceptance into Honors in the Major program.</td>
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<td>Typically Offered: Fall and spring Open by invitation to computer science majors with a GPA of 3.5 or higher in the major. This Honors in the Major course focuses on the development of a creative research project in computer science, its presentation, discussion of relevant research materials, and the reporting of findings. 9 hours supervision. (002391)</td>
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<td>Repeatability: You may take this course for a maximum of 3 units</td>
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<td>Course Attributes: Upper Division</td>
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CSCI 511 Advanced Object-Oriented Programming 3 Units
Prerequisite: CSCI 311 with a grade of C or higher.
 Typically Offered: Fall only
This course is dedicated to the analysis, design, and implementation of programming problems using an object-oriented approach. Modern object-oriented languages are utilized. Topics include inheritance, the underlying implementation of polymorphism, exception handling, extending existing system libraries, and approaching algorithm development from an object-oriented perspective. 3 hours lecture. (002356)
Grade Basis: Graded
Repeatability: You may take this course for a maximum of 3 units
Course Attributes: Upper Division

CSCI 511H Object-Oriented Programming - Honors 3 Units
Prerequisite: CSCI 311 with a grade of C or higher; acceptance into Honors in the Major program.
 Typically Offered: Fall only
Honors version of CSCI 511. In addition to completing all course requirements for CSCI 511, the student is required to research a topic related to Object-Oriented Programming, and propose an independent study to be completed during the following semester. A written research report and proposal is required. A grade of B or higher in this course is necessary in order to use it to earn the Honors in the Major distinction. 3 hours discussion. (020790)
Grade Basis: Graded
Repeatability: You may take this course for a maximum of 3 units
Course Attributes: Upper Division

CSCI 515 Compiler Design 3 Units
Prerequisite: CSCI 311 with a grade of C or higher.
 Typically Offered: Fall and spring
The elements of lexical, syntactical, and semantic analysis including finite and push-down automata, top-down and bottom-up parsing, error detection and recovery, semantic actions and code generation. 3 hours discussion. (002369)
Grade Basis: Graded
Repeatability: You may take this course for a maximum of 3 units
Course Attributes: Upper Division

CSCI 515H Compiler Design - Honors 3 Units
Prerequisite: CSCI 311 with a grade of C or higher, acceptance into Honors in the Major Program.
 Typically Offered: Fall and spring
The elements of lexical, syntactical, and semantic analysis including finite and push-down automata, top-down and bottom-up parsing, error detection and recovery, semantic actions, and code generation. Honors students enrolled in this course are required to implement a significant additional feature in the semester project and to develop an approved proposal in the area of languages/compilers for their Honors Research Project/Thesis. 3 hours discussion. (020185)
Grade Basis: Graded
Repeatability: You may take this course for a maximum of 3 units
Course Attributes: Upper Division

CSCI 540 Systems Programming 3 Units
Prerequisite: CSCI 440 with a grade of C or higher.
 Typically Offered: Fall only
A hands-on project course that examines the development of systems software. It provides an introduction to writing low level programs in the UNIX/Linux environment. Topics include using system calls, processes, threads, concurrency, process/thread synchronization, signals, and interprocess communication. The course includes several large programming projects which provide students solid experience in lower level programming. 3 hours discussion. (002378)
Grade Basis: Graded
Repeatability: You may take this course for a maximum of 3 units
Course Attributes: Upper Division

CSCI 546 Computer Network Management 3 Units
Prerequisite: CSCI 446 with a grade of C or higher.
 Typically Offered: Spring only
This course covers advanced network management concepts and implementations including a network operating system, workstation management, and domain administration. Coverage also includes TCP/IP administration and router/hub management. The course provides hands-on experience on network management in a laboratory environment. 3 hours laboratory, 2 hours lecture. (002382)
Grade Basis: Graded
Repeatability: You may take this course for a maximum of 3 units
Course Attributes: Upper Division

CSCI 551 Numerical Methods and Parallel Programming 3 Units
Prerequisite: CSCI 440 with a grade of C or higher, MATH 109 or MATH 120.
 Typically Offered: Fall and spring
Surveys numerical methods and parallel programming. Parallel architectures and algorithms for scientific programming applications, solution of simultaneous linear and non-linear equations, iterative techniques, matrix methods, and error analysis. Development of parallel algorithms, with a focus on efficient implementation and performance. 2 hours activity, 2 hours discussion. (002332)
Grade Basis: Graded
Repeatability: You may take this course for a maximum of 3 units
Course Attributes: Upper Division

CSCI 565 Advanced Web and Mobile App Development 3 Units
Prerequisite: CINS 467 with a grade C or higher.
 Typically Offered: Spring only
A hands-on project course that examines languages, tools, protocols, and techniques for developing robust server-side interfaces and how to integrate them into cross-platform apps. Topics include the model-view-controller pattern, server-side scripting, using a server-side database, REST, the gRPC remote procedure call framework, web applications security, and hosting robustness. The course includes several projects using a web programming framework and integration into cross-platform client-side apps. 3 hours lecture. (022409)
Grade Basis: Graded
Repeatability: You may take this course for a maximum of 3 units
Course Attributes: Upper Division; Laptop required
CSCI 566  Computer Graphics Programming  3 Units
Prerequisite: CSCI 311 with a grade of C or higher.
Typically Offered: Fall only
This course covers algorithms and data structures in computer graphics. Topics include output primitives and their attributes, 2-D and 3-D geometric transformations and viewing, 3-D object modeling, parallel and perspective projections, visible surface detection, illumination models, and rendering algorithms. 3 hours discussion.  (002363)
Grade Basis: Graded
Repeatability: You may take this course for a maximum of 3 units
Course Attributes: Upper Division

CSCI 580  Artificial Intelligence  3 Units
Prerequisite: CSCI 311 with a grade of C or higher.
Typically Offered: Fall and spring
This course introduces the basic principles, techniques, and applications of artificial intelligence. This course is organized in three sections: search, logic, and learning. Topics include but are not limited to problem-solving, heuristic search, genetic algorithm, game-playing, constraint-satisfaction problems, propositional and predicate logic, knowledge representation, feed-forward neural networks, and decision trees. Students implement and analyze artificial intelligence algorithms. 3 hours discussion.  (002360)
Grade Basis: Graded
Repeatability: You may take this course for a maximum of 3 units
Course Attributes: Upper Division

CSCI 580H  Artificial Intelligence - Honors  3 Units
Prerequisite: CSCI 311 with a grade of C or higher, acceptance into Honors in the Major program.
Typically Offered: Fall and spring
An introduction to the basic principles, techniques, and applications of Artificial Intelligence. Coverage includes knowledge representation, logic, inference, problem solving, search algorithms, game theory, perception, learning, planning, and agent design. Students program with AI language tools. Additional areas may include expert systems, machine learning, natural language processing, and computer vision. Honors students enrolled in this course are held to more rigorous standards and expectations in both assignments, participation, and examination than students in CSCI 580. They are also expected to perform preliminary work for the follow-up course, typically in the form of a literature review and proposal. 3 hours discussion.  (021882)
Grade Basis: Graded
Repeatability: You may take this course for a maximum of 3 units
Course Attributes: Upper Division

CSCI 581  Machine Learning  3 Units
Prerequisite: CSCI 311 with a grade of C or higher; MATH 109 or MATH 120.
Typically Offered: Fall only
This course introduces students to the concepts, theories, and experimental methods of machine learning. This course develops a broad understanding of the issues in implementing machine learning algorithms and systems, especially as they relate to modern data-intensive problems. Topics include but are not limited to experimental design, supervised learning (linear and non-linear regression, parametric and nonparametric learning, support vector machines, Bayesian networks, Hidden Markov Models, and advanced neural networks), unsupervised learning (clustering, dimensionality reduction, and kernel methods), ensemble approaches, learning theory, and reinforcement learning. Students implement and analyze machine learning algorithms. 3 hours discussion.  (022009)
Grade Basis: Graded
Repeatability: You may take this course for a maximum of 3 units
Course Attributes: Upper Division

CSCI 581H  Machine Learning- Honors  3 Units
Prerequisite: CSCI 311 with a grade of C or higher.
Typically Offered: Fall and spring
This course introduces students to the concepts, theories, and experimental methods of machine learning. This course develops a broad understanding of the issues in implementing machine learning algorithms and systems, especially as they relate to modern data-intensive problems. Topics include but are not limited to experimental design, supervised learning (linear and non-linear regression, parametric and nonparametric learning, support vector machines, Bayesian networks, Hidden Markov Models, and advanced neural networks), unsupervised learning (clustering, dimensionality reduction, and kernel methods), ensemble approaches, learning theory, and reinforcement learning. Students implement and analyze machine learning algorithms. Honor students enrolled in this course are held to more rigorous standards and expectations in assignments, participation, and examinations than students in CSCI 581. Students are also expected to perform preliminary work for the follow-up course, typically in the form of a literature review and proposal. 3 hours discussion.  (022108)
Grade Basis: Graded
Repeatability: You may take this course for a maximum of 3 units
Course Attributes: Upper Division

CSCI 582  Bioinformatics  3 Units
Prerequisite: CSCI 311 with a grade of C or higher; MATH 105, MATH 314, or MATH 350 (may be taken concurrently).
Typically Offered: Spring only
An introduction to computational methods for Next Generation Sequencing data analysis. Topics include mapping sequenced reads back to a reference genome; approximate string matching; intro to bioinformatics; probability distribution, hypothesis testing; identification of SNPs (single polymorphisms); analysis of RNA-seq data; mapping RNA-seq reads, identification of splice-junctions, analysis of gene expression; genome-wide associative analysis of methylation and gene expression. 3 hours discussion.  (021619)
Grade Basis: Graded
Repeatability: You may take this course for a maximum of 3 units
Course Attributes: Upper Division
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<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
<th>Prerequisite</th>
<th>Typically Offered:</th>
<th>Course Attributes</th>
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<tbody>
<tr>
<td>CSCI 585</td>
<td>Robotics and Machine Intelligence</td>
<td>3 Units</td>
<td>CSCI 211, EECE 237 both with a grade of C or higher; MATH 109 or MATH 120.</td>
<td>Spring only</td>
<td>Upper Division</td>
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<td>Laptop required</td>
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<tr>
<td>CSCI 598</td>
<td>Adv Topic in Computer Science</td>
<td>1-4 Units</td>
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<td>Upper Division</td>
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<td>CSCI 611</td>
<td>Applied Machine Learning</td>
<td>3 Units</td>
<td>CSCI 311 and classified graduate standing.</td>
<td>Spring only</td>
<td>Graduate Division</td>
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<tr>
<td>CSCI 612</td>
<td>Applied Computer Vision</td>
<td>3 Units</td>
<td>CSCI 311 or equivalent with C or higher.</td>
<td>Spring only</td>
<td>Graduate Division</td>
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<tr>
<td>CSCI 620</td>
<td>Web Technology</td>
<td>3 Units</td>
<td>CINS 467 with a grade of C or higher, or web programming experience, and classified graduate standing.</td>
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<td>Fall only</td>
<td>Graduated Division</td>
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<tr>
<td>CSCI 630</td>
<td>Software Design and Maintenance</td>
<td>3 Units</td>
<td>CSCI 430 and classified graduate standing.</td>
<td>Spring only</td>
<td>Graduate Division</td>
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<tr>
<td>CSCI 640</td>
<td>Operating Systems</td>
<td>3 Units</td>
<td>CSCI 440 and classified graduate standing.</td>
<td>Fall only</td>
<td>Upper Division</td>
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<tr>
<td>CSCI 650</td>
<td>Algorithms and Computability</td>
<td>3 Units</td>
<td>CSCI 311 and classified graduate standing.</td>
<td>Spring only</td>
<td>Graduate Division</td>
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<tr>
<td>CSCI 651</td>
<td>Applied Graph Theory</td>
<td>3 Units</td>
<td>CSCI 311 and classified graduate standing.</td>
<td>Fall only</td>
<td>Graduate Division</td>
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**Course Attributes:**
- Grade Basis:
- Repeatability: You may take this course for a maximum of 3 units
- Graduate Division
- Laptop required
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<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
<th>Description</th>
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<tbody>
<tr>
<td>CSCI 682</td>
<td>Topics in Artificial Intelligence</td>
<td>3</td>
<td>Further study of selected advanced topics in artificial intelligence as presented in recently published journals; possible emphasis on research interests and/or projects of faculty in the department. Consult the Graduate Coordinator to determine how many units may be counted toward your major. 3 hours lecture. (002402)</td>
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<td><strong>Typically Offered:</strong> Inquire at department</td>
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<td><strong>Grade Basis:</strong> Graduate Graded</td>
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<td><strong>Repeatability:</strong> You may take this course for a maximum of 12 units</td>
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<td><strong>Course Attributes:</strong> Graduate Division</td>
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<tr>
<td>CSCI 689</td>
<td>Internship</td>
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<td><strong>Typically Offered:</strong> Fall and spring</td>
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<td>0 hours supervision.</td>
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<td><strong>Grade Basis:</strong> Report in Progress: CR/NC</td>
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<td><strong>Repeatability:</strong> You may take this course for a maximum of 3 units</td>
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<td><strong>Course Attributes:</strong> Graduate Division</td>
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<tr>
<td>CSCI 693</td>
<td>Research Methods in Computer Science</td>
<td>3</td>
<td>This course interweaves three distinct themes (investigation, experimentation, and technical writing), that culminate in a comprehensive research project, written report, presentation, and oral defense. First, the students are immersed into the research process within Computer Science. This includes an understanding of the role, ethics, and responsibility of researchers in Computer Science. The second focus is on rigorous design of experiments for the purpose of testing research hypotheses, simulations, and models, and interpreting the results of those experiments. Finally, proficiency in communication of scientific ideas and findings will be addressed, from intensive reading, critiques, technical writing and oral presentations. 9 hours supervision. (020616)</td>
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<td><strong>Typically Offered:</strong> Fall and spring</td>
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<td><strong>Grade Basis:</strong> Report in Progress: Graded</td>
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<td><strong>Repeatability:</strong> You may take this course for a maximum of 3 units</td>
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<td><strong>Course Attributes:</strong> Graduate Division</td>
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<tr>
<td>CSCI 697</td>
<td>Independent Study</td>
<td>1-6</td>
<td>This course is an independent study offered for 1.0-6.0 units. You must register directly with a supervising faculty member. Independent study and investigation of special problems in student’s area of concentration. Both registration and study plan must have approval of the instructor and the student’s graduate advisory committee chair. Master’s Thesis courses earn a Credit grade upon completion. 9 hours supervision. (002453)</td>
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<td><strong>Typically Offered:</strong> Fall and spring</td>
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<td><strong>Grade Basis:</strong> Report in Progress: CR/NC</td>
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<td><strong>Repeatability:</strong> You may take this course for a maximum of 6 units</td>
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<td><strong>Course Attributes:</strong> Graduate Division</td>
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<tr>
<td>CSCI 699P</td>
<td>Master’s Project</td>
<td>3</td>
<td>You must register directly with a supervising faculty member. Independent study and investigation of special problems in student’s area of concentration. Both registration and study plan must have approval of the instructor and the student’s graduate advisory committee chair. Master’s Project courses earn a Credit grade upon completion. 9 hours supervision. (002461)</td>
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<td><strong>Typically Offered:</strong> Fall and spring</td>
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<td><strong>Grade Basis:</strong> Report in Progress: CR/NC</td>
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<td><strong>Repeatability:</strong> You may take this course for a maximum of 3 units</td>
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<td><strong>Course Attributes:</strong> Graduate Division</td>
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<tr>
<td>CSCI 699T</td>
<td>Master’s Thesis</td>
<td>1-6</td>
<td>This course is offered for 1.0-6.0 units. You must register directly with a supervising faculty member. Independent study and investigation of special problems in student’s area of concentration. Both registration and study plan must have approval of the instructor and the student’s graduate advisory committee chair. Master’s Thesis courses earn a Credit grade upon completion. 9 hours supervision. (002453)</td>
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<td><strong>Typically Offered:</strong> Fall and spring</td>
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<td><strong>Grade Basis:</strong> Report in Progress: CR/NC</td>
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<td><strong>Repeatability:</strong> You may take this course for a maximum of 6 units</td>
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<td><strong>Course Attributes:</strong> Graduate Division</td>
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## Computer Science Education

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<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
<th>Description</th>
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<tr>
<td>CSED 500</td>
<td>Computational Thinking</td>
<td>3</td>
<td>This course explores broad concepts and applications of Computer Science including Human-Computer Interaction, problem solving, web design, programming, computing and data analysis, and robotics. The course introduces programming in a graphical, block-based development environment. Synchronous online activity; tablet, laptop, or desktop computer is required. 3 hours lecture. (022210)</td>
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<td><strong>Typically Offered:</strong> Summer session only</td>
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<tr>
<td>CSED 501</td>
<td>Computing Practice and Programming</td>
<td>3</td>
<td>In a broad introduction to Computer Science, this course emphasizes problem solving by collaboratively designing, developing, and evaluating algorithms. The class explores creative development, abstraction, data representation, computer systems and networks, and impacts of computing while learning the fundamentals of high-level programming in Python. Synchronous online discussion and laboratory; laptop or desktop computer is required. 3 hours lecture. (022211)</td>
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<td><strong>Typically Offered:</strong> Summer session only</td>
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<tr>
<td>CSCI 682</td>
<td>Seminar in Advanced Topics</td>
<td>3</td>
<td>This course is a seminar offered for 1.0-3.0 units. Typical subjects in past semesters have included microprogramming theory, operating system development, software engineering principles, data communications, analysis of algorithms, and program optimization. Consult the Class Schedule for listing and prerequisites. 2 hours activity, 2 hours discussion. (002446)</td>
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<td></td>
<td><strong>Typically Offered:</strong> Inquire at department</td>
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<td></td>
<td><strong>Grade Basis:</strong> Graduate Graded</td>
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<td></td>
<td><strong>Repeatability:</strong> You may take this course for a maximum of 3 units</td>
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<tr>
<td>CSCI 682</td>
<td>Seminar in Artificial Intelligence</td>
<td>3</td>
<td>This course is a seminar offered for 1.0-3.0 units. Typical subjects in past semesters have included microprogramming theory, operating system development, software engineering principles, data communications, analysis of algorithms, and program optimization. Consult the Class Schedule for listing and prerequisites. 2 hours activity, 2 hours discussion. (002446)</td>
</tr>
<tr>
<td>CSCI 697</td>
<td>Independent Study</td>
<td>1-6</td>
<td>This course is an independent study offered for 1.0-6.0 units. You must register directly with a supervising faculty member. Independent study and investigation of special problems in student’s area of concentration. Both registration and study plan must have approval of the instructor and the student’s graduate advisory committee chair. Master’s Thesis courses earn a Credit grade upon completion. 9 hours supervision. (002453)</td>
</tr>
<tr>
<td>CSCI 699P</td>
<td>Master’s Project</td>
<td>3</td>
<td>You must register directly with a supervising faculty member. Independent study and investigation of special problems in student’s area of concentration. Both registration and study plan must have approval of the instructor and the student’s graduate advisory committee chair. Master’s Project courses earn a Credit grade upon completion. 9 hours supervision. (002461)</td>
</tr>
<tr>
<td>CSCI 699T</td>
<td>Master’s Thesis</td>
<td>1-6</td>
<td>This course is offered for 1.0-6.0 units. You must register directly with a supervising faculty member. Independent study and investigation of special problems in student’s area of concentration. Both registration and study plan must have approval of the instructor and the student’s graduate advisory committee chair. Master’s Thesis courses earn a Credit grade upon completion. 9 hours supervision. (002453)</td>
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<td>Master’s Thesis</td>
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</tr>
</tbody>
</table>

**Typically Offered:** Summer session only

**Grade Basis:** Report in Progress: CR/NC

**Repeatability:** You may take this course for a maximum of 6 units

**Course Attributes:** Upper Division; Laptop required
CSED 510 Technology for Computer Science Education 2 Units
Prerequisite: CSED 500, CSED 501 or CSCI 111.
Typically Offered: Fall only
Hardware and software technologies evolve rapidly. This course provides
an overview of components and integrated systems of computers
and networking. Students complete a supervised project to plan and
integrate educational technologies for Computer Science classrooms.
The project explores technology for supporting evidence-based
pedagogy to foster interactive, creative, and inclusive Computer Science
education. Asynchronous online lecture and supervised project. 6 hours
supervision. (022212)
Grade Basis: Graded
Repeatability: You may take this course for a maximum of 2 units
Course Attributes: Upper Division; Laptop required

CSED 511 Computing in Society 2 Units
Prerequisite: CSED 500, CSED 501, or CSCI 111.
Typically Offered: Spring only
Computers are ubiquitous and influential in shaping 21st century society.
This course discusses the impacts of computers on individuals and on
society. It also addresses issues of inclusion and equity in Computer
Science pedagogy and relates contemporary social issues to the
discipline. Students complete a supervised project to develop educational
materials for Computer Science classrooms that contextualize
computing in society. 6 hours supervision. (022280)
Grade Basis: Graded
Repeatability: You may take this course for a maximum of 2 units
Course Attributes: Upper Division

CSED 590 Software Design, Data Structures, and Algorithms 4 Units
Prerequisite: CSCI 111 or CSED 501.
Typically Offered: Summer session only
This course explores the design and construction of software
applications by adopting the Agile software development process.
Students practice the fundamentals Object-Oriented Programming with
the Java programming language. Concepts include primitive types and
operations, objects and classes, boolean expressions, decisions, iteration,
single- and multi-dimensional arrays, inheritance, recursion, sorting, and
searching. Projects involve software engineering practices and tools,
including professional integrated development environments (IDE), to
create real software applications. 4 hours lecture. (022284)
Grade Basis: Graded
Repeatability: You may take this course for a maximum of 4 units
Course Attributes: Upper Division; Laptop required

Computer Science Department

The Faculty
Abbas Attarwala 2022
Associate Professor
Doctor of Philosophy University of Waterloo

Kevin J Buffardi 2014
Associate Professor
Doctor of Philosophy Virginia Polytechnic Institute

Bryan C Dixon 2013
Associate Professor
Doctor of Philosophy Univ of Colorado at Boulder

Todd A Gibson 2012
Professor
Doctor of Philosophy Univ of Colorado at Denver

Elena Y Harris 2013
Associate Professor
Doctor of Science Univ of Cal-Riverside

Tyson R Henry 2001
Chair
Doctor of Philosophy Univ of Arizona

Brian D Herring 2007
Lecturer
Master of Science CSU-Chico

Shahid Iqbal 2010
Lecturer
Bachelor of Science CSU-Chico

Ben Juliano 1998
Professor
Doctor of Philosophy Florida St Univ

Michael Larson 2021
Lecturer
Master of Science Liberty Univ

Jaime A Raigoza 2000
Associate Professor
Doctor of Science Nova Univ

Sam B Siewert 2020
Associate Professor
Doctor of Philosophy Univ of Colorado at Boulder

Kun Tian 2022
Associate Professor
Doctor of Philosophy Univ of Texas at Dallas

Richard C Tillquist 2020
Assistant Professor
Doctor of Philosophy Univ of Colorado at Boulder

Shelley M Wong 2019
Lecturer
Master of Science CSU-Chico

David R Zeichick 2005
Assistant Professor
Doctor of Philosophy Nova Univ

Emeritus Faculty
Judith A Challinger
Emeritus
Doctor of Philosophy Univ of Cal-Santa Cruz

Leonard W Fisk
Emeritus
Doctor of Philosophy Univ of Cal-Irvine

Helen J Gesick
Emeritus
Master of Science CSU-Chico

Ralph C Huntsinger 1971
Emeritus
Doctor of Philosophy Montana St Univ

Seung B Im
Emeritus
Doctor of Philosophy Southern Methodist Univ

**Anne M Keuneke**
Emeritus
Doctor of Philosophy

**Clement H Luk** 1972
Emeritus
Master of Science SUNY at BUFFALO

**Orlando S Madrigal** 1970
Emeritus
Doctor of Philosophy Texas A & M Univ at Galveston

**William J Mcnelley**
Emeritus
Doctor of Philosophy Oregon St Univ

**Jim Murphy**
Emeritus
Doctor of Philosophy Michigan St Univ

**Renee S Renner**
Emeritus
Doctor of Philosophy Florida St Univ

**Melody J Stapleton**
Emeritus
Doctor of Philosophy Univ of Cal-Riverside