Program

BS in Computer Science
Options in:
- General
- Math/Science
- Systems
- Computer Graphics Programming

BS in Computer Information Systems

BS in Applied Computer Graphics
Options in:
- Production
- Technical

Minor in Computer Science

MS in Computer Science

The BS in Computer Science, BS in Computer Information Systems, and BS in Applied Computer Graphics, with their various options, allow students to prepare for careers in diverse areas of applications of Computer Science.

The MS in Computer Science provides a strong graduate-level foundation in Computer Science while also allowing exploration in areas of interest in the discipline.

The department offers students the opportunity to earn the distinction of Honors in Computer Science, Computer Information Systems, or Applied Computer Graphics. This recognition appears on the student’s permanent transcript and on their diploma. The Honors confers a distinction that enhances opportunities for graduate work and employment.

Faculty and Facilities

The breadth of faculty expertise is evident from the many courses offered on varied topics: operating systems, programming languages, artificial intelligence, computer architecture, digital logic design, database management, computer graphics, compiler theory, software engineering, computer networks, and data communications.

The College of Engineering, Computer Science, and Construction Management is housed in the O’Connell Technology Center. Computing facilities available to computer science majors include five general-purpose labs containing Hewlett-Packard, Sun Microsystems, and Windows 2000 workstations. A seventh lab containing Hewlett-Packard workstations is available to members of Network for Women in Technology (NeWT). Additionally, the department has a separate computer networks laboratory, which allows students hands-on experiences in configuring and reconfiguring various types of networks, and the analysis of data obtained from network analyzers.

A variety of software tools are available, including a full complement of UNIX utilities, X windows tools, GNU software, Oracle relational database, Java development environment, AI programming libraries and shells, and software packages or programming tools that support computer-aided software engineering, graphics and animation, etc.

The O’Connell Technology Center computing laboratories utilize several high-speed local area networks and is connected to the rest of campus via an aggregated ethernet link. Computer science students have access to several high-speed modem pools for remote access.

Student Organizations

Student chapters of the Association for Computing Machinery (ACM), Institute of Electrical and Electronics Engineers (IEEE), Society of Women Engineers (SWE), and the Upsilon Pi Epsilon (UPE) international honor society are active on campus. Additionally, the Chico State Linux Users’ Group (CSLUG) and Network for Women in Technology (NeWT) also provide opportunities for various student activities.

Cooperative Work Experience

The computer industry holds the Department in high regard in part because of its active participation in the Cooperative Work Experience Program. Students are placed with firms such as IBM, ChevronTexaco, SUN, and Hewlett-Packard, and various government laboratories. Selected students stop-out for a term and a summer (six to eight months) and work in the field and receive normal employee salary and academic credit for their valuable experience.

Career Outlook

The computer has enabled society to keep abreast of the increasing need for more and better information, opening up a wide range of computer-related jobs. Given the current expansion of science and technology, employment of trained computer scientists is expected to remain very high.

Accreditation

The B.S. in Computer Science degree is accredited by the Computing Accreditation Commission of ABET, 111 Market Place, Suite 1050, Baltimore, MD 21202-4012, telephone: (410) 347-7700.

Highlighted text indicates a change from the original publication.
THE BACHELOR OF SCIENCE IN COMPUTER SCIENCE

Total Course Requirements for the Bachelor's Degree: 128 units

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

For Math Science Option:

is fulfilled by CSCI 351 or MATH 460.

same Theme. See your adviser for assistance in identifying courses

course and an upper-division Social Science Thematic course from the

292

Prerequisites: Completion of ELM requirement; MATH 120 with a grade of C- or higher.

MATH 121 Analytic Geometry and Calculus 4.0 FS (or high school equivalent); a score that meets department guidelines on a

Prerequisites: Completion of ELM requirement; both MATH 118 and MATH 119 (or high school equivalent); a score that meets department guidelines on a department administered calculus readiness exam.

MATH 121 Analytic Geometry and Calculus 4.0 FS Prerequisites: Completion of ELM requirement; MATH 120 with a grade of C- or higher.

PHYS 204A Mechanics 4.0 FS * Prerequisites: High school physics or faculty permission. Concurrent enrollment in or prior completion of MATH 121 (second semester of calculus) or equivalent.

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

Upper-Division Core: 31 units

10 courses required:

CSCI 303 Computer’s Impact on Society 3.0 FS * Prerequisites: Junior standing.

CSCI 305 Proj Requirements/Design/Test 3.0 FS Prerequisites: ENGL 130; CSCI 112 or ECE 221.

CSCI 311 Algorithms and Data Structures 3.0 FS Prerequisites: Grade of C- or better in CSCI 112.

CSCI 315 Programming Languages 3.0 FS Prerequisites: CSCI 112.

CSCI 320 Computer Architecture 3.0 FS Prerequisites: CSCI 221.

CSCI 330 Software Engineering 3.0 FS WP Prerequisites: CSCI 311, ENGL 130 (or its equivalent) with a grade of C- or higher.

CSCI 340 Operating Systems Programming 3.0 FS Prerequisites: CSCI 311, CSCI 320.

CSCI 490 Directed Programming Exp 1.0-3.0 FS Prerequisites: CSCI 311, faculty permission.

NOTE: One unit of CSCI 490 is required

CSCI 550 Theory of Computing 3.0 FS Prerequisites: MATH 317.

MATH 317 Discrete Math Structures 3.0 FS Prerequisites: MATH 120.

1 course selected from:

CSCI 470 Database Management 3.0 FS Prerequisites: CSCI 112.

CSCI 547 Computer Networks 3.0 FS Prerequisites: CSCI 340.

CSCI 566 Computer Graphics Programming 3.0 FS Prerequisites: CSCI 311.

CSCI 567 Graphical User Interface Impl 3.0 SP Prerequisites: CSCI 311.

CSCI 583 Expert Systems & Applications 3.0 SP Prerequisites: CSCI 312.

CSCI 580 Artificial Intelligence 3.0 FA Prerequisites: Grade of C- or better in CSCI 311.

Major Option Course Requirements: 19-33 units

The following courses, or their approved transfer equivalents, are required dependent upon the option chosen. Students must select one of the following options for completion of the major course requirements.

THE OPTION IN GENERAL COMPUTER SCIENCE: 19 units

1 course selected from:

One upper-division General Education Natural Sciences Thematic course approved in advance by your CSCI adviser. See General Education requirements.

2 courses required:

CSCI 515 Compiler Design 3.0 FS Prerequisites: CSCI 112.

MATH 314 Prob & Stat for Science & Tech 4.0 FS Prerequisites: MATH 121.

9 units selected from:

Any upper-division Computer Science (CSCI) courses (minimum of two courses at the 400-level) except CSCI 490 and CSCI 399.

THE OPTION IN MATH/SCIENCE: 33 units

6 courses required:

CHEM 111 General Chemistry 4.0 FS * Prerequisites: Second-year high school algebra; one year high school chemistry. (One year of high school physics and one year of high school mathematics past Algebra II are recommended.)

MATH 220 Analytic Geometry and Calculus 4.0 FS Prerequisites: Completion of ELM requirement; MATH 121 with a grade of C- or higher.

MATH 260 Elem Differential Equations 4.0 FS Prerequisites: Completion of ELM requirement, MATH 121 with a grade of C- or better.

MATH 335 Elementary Linear Algebra 3.0 FS Prerequisites: MATH 121.

MATH 350 Intro to Probability/Stat 3.0 FA Prerequisites: MATH 121.

PHYS 204C Heat/Wave Motion/Sound/Light 4.0 FS Prerequisites: MATH 121, PHYS 204A with a grade of C- or higher.

Highlighted text indicates a change from the original publication.
3 units selected from:
CSCI 351 Numerical Methods Programming 3.0 Inq
Prerequisites: CSCI 112 or EECE 135; MATH 220.
MATH 460 Numerical Analysis 3.0 S2
Prerequisites: MATH 220, MATH 335, completion of the computer literacy requirement.
MATH 461 Numerical Analysis 3.0 S1
Prerequisites: MATH 260 (may be taken concurrently), MATH 335, completion of the computer literacy requirement. MATH 460 is not a prerequisite for MATH 461.

8 units selected from:
Any upper-division Computer Science (CSCI) course except CSCI 399 and CSCI 490.

THE OPTION IN SYSTEMS: 19 units

1 course selected from:
One upper-division General Education Natural Sciences Thematic course approved in advance by your CSCI adviser. See General Education requirements.

5 courses required:
CSCI 515 Compiler Design 3.0 FS
Prerequisites: CSCI 112.
CSCI 520 Digital Logic Design Theory 3.0 SP
Prerequisites: CSCI 320.
CSCI 540 Multi-User Operating Systems 3.0 FA
Prerequisites: CSCI 340 or permission of instructor.
CSCI 542 Systems Design 3.0 FA
Prerequisites: CSCI 330.
MATH 314 Prob & Stat for Science & Tech 4.0 FS
Prerequisites: MATH 121.

THE OPTION IN COMPUTER GRAPHICS PROGRAMMING: 24-25 units

1 course selected from:
One upper-division General Education Natural Sciences Thematic course approved in advance by your CSCI adviser. See General Education requirements.

4 courses required:
APCG 110 Computer-Assisted Art I 3.0 FS *
APCG 330 3-D Computer Modeling 3.0 FS
Prerequisites: APCG 110 or previous computer graphics experience.
APCG 340 Computer Animation 3.0 FS
Prerequisites: APCG 110 and APCG 330 or permission of instructor.
MATH 314 Prob & Stat for Science & Tech 4.0 FS
Prerequisites: MATH 121.

2 courses selected from:
APCG 360 Web Page Design 3.0 FA
Prerequisites: CSCI 111.
CSCI 465 Web Programming Fundamentals 3.0 SP
Prerequisites: CSCI 311.
CSCI 467 Graphical User Interface Des 3.0 FA
Prerequisites: CSCI 311.
CSCI 545 Advanced Animation Production 3.0 FS
Prerequisites: APCG 110, APCG 330, APCG 340.
CSCI 567 Graphical User Interface Impl 3.0 SP
Prerequisites: CSCI 311.

1 course selected from:
ARTS 122 Color Theory 3.0 FS
ARTS 240 Intro to Fine Art Photography 3.0 FS
CDES 131 Visual Communication Concepts 2.0 FS
CDES 206 Intro Photo Com & Dig Imaging 3.0 FS

Electives Requirement:
To complete the total units required for the bachelor’s degree, select additional elective courses from the total university offerings. You should consult with an adviser regarding the selection of courses which will provide breadth to your university experience and possibly apply to a supportive second major or minor.

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

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

A grade of C- or better is required in all computer science courses required for the major.

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

Honors in the Major

Honors in the Major is a program of independent work in your major. It involves 6 units of honors course work completed over two semesters. Your Honors work will be recognized at your graduation, on your permanent transcripts, and on your diploma. It is often accompanied by letters of commendation from your mentor in the department or the department chair. Most importantly, however, the Honors in the Major program allows you to work closely with a faculty mentor in your area of interest on an original performance or research project. This year-long collaboration allows you to work in your field at a professional level and culminates in a public presentation of your work. Students sometimes take their projects beyond the university for submission in professional journals, presentation at conferences, or competition in shows; such experience is valuable for graduate school and later professional life.

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

While Honors in the Major is part of the Honors Program, each department administers its own program. Please contact your major department or major adviser for further information.

Honors in Computer Science

In addition to the common requirements for the Honors in the Major program given above, the Honors in Computer Science program includes the following:
1. You must be recommended by a faculty member.
2. Students who are admitted to the department’s Honors in the Major program must complete 3 units of CSCI 465H, CSCI 470H, CSCI 515H, CSCI 520H, CSCI 540H, CSCI 547H, CSCI 550H, CSCI 566H, CSCI 567H, CSCI 580H, or CSCI 583H with a minimum grade of B. Unless other arrangements are made, the professor instructing the course you take becomes your faculty mentor. It is during this time that you must define a research problem or performance area and develop an Honors Research Project/Thesis proposal in preparation for work in CSCI 499H. You must also maintain a minimum GPA of 3.0 in your senior year. (NOTE: For the BS in Computer Information Systems, the Honors choices are CSCI 463H, CSCI 470H, CSCI 511H, CSCI 540H, CSCI 546H, CSCI 547H, or CSCI 570H. At the time of catalog publication, a proposed BS in Applied Computer Graphics is under review. Once that program is approved, the appropriate Honors courses will be CSCI 465H, CSCI 545H, CSCI 566H, or CSCI 567H.)
3. Each Honors in the Major class will require completion of the course plus an additional Honors project and culminates with a public presentation of your Honors project.
Computer Science

THE BACHELOR OF SCIENCE IN COMPUTER INFORMATION SYSTEMS

Total Course Requirements for the Bachelor’s Degree: 128 units

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

A suggested Major Academic Plan (MAP) has been prepared to help students meet all graduation requirements within four years. Please request a plan from your major adviser or view it and other current advising information on the CSU, Chico Web.

General Education Requirements: 48 units

See “General Education Requirements” in The University Catalog and The Class Schedule for the most current information on General Education Requirements and course offerings. The course requirements marked below with an asterisk (*) may also be applied toward General Education.

For additional university requirements, please see Cultural Diversity, and Literacy Requirements under the Bachelor of Science in Computer Science.

American Institutions Requirement: 6 units

See the “American Institutions Requirement” under “Bachelor’s Degree Requirements.” For this major, this requirement is normally fulfilled by completing HIST 130 and POLS 155. For this major, HIST 130 may also be applied to General Education Breadth Area C1, C2, or C3, and POLS 155 may also be applied to General Education Breadth Area D1, D2, or D3.

Course Requirements for the Major: 79 units

The following courses, or their approved transfer equivalents, are required of all candidates for this degree.

Completion of these requirements also satisfies requirements for a minor in Business Administration.

Lower-Division Requirements: 18 units

5 courses required:

CSCI 111 Programming and Algorithms I 3.0 FS
Prerequisites: At least one year of high school algebra and strong computer skills or CSCI 101.
CSCI 112 Programming and Algorithm II 3.0 FS
Prerequisites: Grade of C- or better in CSCI 111 (or ECE 135 for engineering majors).
CSCI 221 Assembly Language Programming 3.0 FS
Prerequisites: CSCI 112.
MATH 105 Statistics 3.0 FS *
Prerequisites: Completion of ELM requirement.
MATH 109 Survey of Calculus 3.0 FS *
Prerequisites: Completion of ELM requirement. This course is not intended for majors in mathematics, physics, chemistry, or engineering.

1 course selected from:

CSCI 110 Intro to Applications Prog 3.0 FS
Prerequisites: CSCI 111.
CSCI 144 Introduction to UNIX Operating 3.0 FS

Upper-Division Requirements: 37 units

7 courses required:

CSCI 305 Proj Requirements/Design/Test 3.0 FS
Prerequisites: ENGL 130, CSCI 112 or ECE 221. This course is also offered as ECE 335.
CSCI 311 Algorithms and Data Structures 3.0 FS
Prerequisites: Grade of C- or better in CSCI 112.
CSCI 320 Computer Architecture 3.0 FS
Prerequisites: CSCI 221.
CSCI 330 Software Engineering 3.0 FS WP
Prerequisites: CSCI 311, ENGL 130 (or its equivalent) with a grade of C- or higher.
CSCI 340 Operating Systems Programming 3.0 FS
Prerequisites: CSCI 311, CSCI 320.
CSCI 470 Database Management 3.0 FS
Prerequisites: CSCI 112.
CSCI 490 Directed Programming Exp 1.0-3.0 FS
Prerequisites: CSCI 311, faculty permission.

NOTE: One unit of CSCI 490 is required.

6 courses selected from:

Choose courses from the Database/ERP, Networking, Systems, Web, or Computer Science listings below.

A minimum of one course must be from the Networking selections. A minimum of one course must be from the Web selections.

NOTE that prerequisites for the MINS courses are waived for CIS students, but course content is unchanged.

Database/ERP:

BSIS 420 ERP: Systems Config and Use 3.0 FS
Prerequisites: MINS 350; permission of instructor.
BSIS 524 Business Programming with ABAP 3.0 FS
Prerequisites: CSCI 111, permission of instructor; either BSIS 420 or MINS 522.
CSCI 570 Advanced Database Mgmt Systems 3.0 FA
Prerequisites: CSCI 470 or MINS 235.
MINS 335 Database Application Dev 3.0 FS
Prerequisites: BSIS 301, MINS 235.
MINS 522 ERP: Systems Adm 3.0 FS
Prerequisites: Concurrent enrollment in or prior completion of MINS 345 and instructor permission.
MINS 535 Database Administration 3.0 FS
Prerequisites: MINS 335 and instructor permission.

Networking:

CSCI 346 Intro to Computer Netwks/Mgmt 3.0 FS
Prerequisites: CSCI 111.
CSCI 546 Adv Network Management 3.0 SP
CSCI 547 Computer Networks 3.0 FS
Prerequisites: CSCI 340.
MINS 345 Distributed Systems Management 3.0 FS
Prerequisites: BSIS 301, MINS 245.
MINS 545 Adv Distributed Systems Mgmt 3.0 FS
Prerequisites: MINS 345 and permission of instructor.

Systems:

CSCI 344 UNIX Power Utilities Shell Prg 3.0 FA
CSCI 444 Fundamental UNIX System Admin. 3.0 SP
Prerequisites: CSCI 344 and permission of instructor.
CSCI 540 Multi-User Operating Systems 3.0 FA
Prerequisites: CSCI 340 and permission of instructor.
CSCI 542 Systems Design 3.0 FA
Prerequisites: CSCI 330.

Web:

APCG 360 Web Page Design 3.0 FA
Prerequisites: CSCI 111.
CDES 322 Advanced WWW Design & Publish 3.0 FS
Prerequisites: CDES 222.
CDES 323 Human Interface Design 3.0 FA
Prerequisites: CDES 222.
CSCI 465 Web Programming Fundamentals 3.0 SP
Prerequisites: CSCI 311.
CSCI 511 Object-Oriented Programming 3.0 FA
Prerequisites: CSCI 311.
BSIS 524 E-Com & Client Server Computing 3.0 FS
Prerequisites: MINS 350; prior completion or concurrent enrollment in MINS 345.

Computer Science:

Any 400-level Computer Science course approved by adviser.

Business Minor Requirement: 24 units

The following courses, or their approved transfer equivalents, also fulfill requirements for a Minor in Business Administration.

8 courses required:

ACCT 201 Intro to Financial Accounting 3.0 FS
ACCT 202 Intro to Managerial Accounting 3.0 FS
Prerequisites: ACCT 201 (or ABUS 261 for ABUS majors only).
BLAW 302 Managing the Legal Environment 3.0 FS
Prerequisites: At least junior standing.
ECON 103 Principles of Micro Analysis 3.0 FS *
FINA 307 Survey of Finance 3.0 FS
Prerequisites: ACCT 201, ECON 103.
MGMT 303 Managing People/Bus Proc/Chg 3.0 FS
MINS 301 Corporate Tech Integration 3.0 FS
MKTG 305 Survey of Marketing 3.0 FS

For additional university requirements, please see Elective, Graduation, Grading, and Advising Requirements under the Bachelor of Science in Computer Science. Also see Honors in the Major, if applicable.
THE BACHELOR OF SCIENCE IN COMPUTER ENGINEERING

The Department of Electrical and Computer Engineering offers the BS in Computer Engineering. See the Engineering chapter.

THE BACHELOR OF SCIENCE IN APPLIED COMPUTER GRAPHICS

At the time of catalog publication, this proposed degree program is under review at the California State University Chancellor’s Office. Please contact the department to learn the current status of the program.

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

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

A suggested Major Academic Plan (MAP) has been prepared to help students meet all graduation requirements within four years. Please request a plan from your major adviser or view it and other current advising information on the CSU, Chico Web.

General Education Requirements: 48 units

See “General Education Requirements” in The University Catalog and The Class Schedule for the most current information on General Education Requirements and course offerings. The course requirements marked below with an asterisk (*) may also be applied toward General Education.

Cultural Diversity Course Requirements: 6 units

See “Cultural Diversity” in The University Catalog. Most courses taken to satisfy these requirements may also apply to General Education.

American Institutions Requirement: 6 units

See the “American Institutions Requirement” under “Bachelor’s Degree Requirements.” This requirement is normally fulfilled by completing HIST 130 and POLS 155. Courses used to satisfy this requirement do not apply to General Education.

Literacy Requirement:

See “Mathematics and Writing Requirements” in The University Catalog. Writing proficiency in the major is a graduation requirement and may be demonstrated through satisfactory completion of a course in your major which has been designated as the Writing Proficiency (WP) course for the semester in which you take the course. Students who earn below a C- are required to repeat the course and earn a C- or better to receive WP credit. See The Class Schedule for the designated WP courses for each semester. You must pass ENGL 130 (or its equivalent) with a C- or better before you may register for a WP course.

Course Requirements for the Major: 66-72 units

The following courses, or their approved transfer equivalents, are required of all candidates for this degree. Additional required courses, depending upon the selected option or advising pattern, are outlined following the degree core program requirements.

DEGREE CORE PROGRAM: 18 units

6 courses required:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
<th>Type</th>
</tr>
</thead>
</table>
| APCG 110    | Computer-Assisted Art I                   | 3.0   | FS *
| APCG 112    | Digital Photography                       | 3.0   | FS   |
| APCG 117    | Concept Design & Storyboarding            | 3.0   | FS   |
| APCG 330    | 3-D Computer Modeling                     | 3.0   | FS   |
| APCG 340    | Computer Animation                        | 3.0   | FS   |
| CSCI 111    | Programming and Algorithms I              | 3.0   | FS   |

Prerequisites: APCG 110 or previous computer graphics experience.

Prerequisites: At least one year of high school algebra and strong computer skills or CSCI 101.

Major Option Course Requirements: 22-27 units

The following courses, or their approved transfer equivalents, are required dependent upon the option chosen. Students must select one of the following options for completion of the major course requirements.

THE OPTION IN PRODUCTION: 22 units

13 units required:

<table>
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<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
<th>Type</th>
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</thead>
<tbody>
<tr>
<td>APCG 345</td>
<td>Adv Animation Pre-Production</td>
<td>3.0</td>
<td>FS</td>
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<tr>
<td>CSCI 389</td>
<td>Industry Internship</td>
<td>1.0-3.0</td>
<td>FS</td>
</tr>
<tr>
<td>CSCI 389</td>
<td>Special Problems</td>
<td>1.0-3.0</td>
<td>FS</td>
</tr>
</tbody>
</table>

Prerequisites: APCG 110, APCG 330, APCG 340.

Applied Computer Graphics Electives: 9 units

3 courses selected from:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>APCG 360</td>
<td>Web Page Design</td>
<td>3.0</td>
<td>FA</td>
</tr>
<tr>
<td>CDES 214</td>
<td>Computer Graphics</td>
<td>3.0</td>
<td>FS</td>
</tr>
<tr>
<td>CDES 216</td>
<td>Introduction to Audio in Media</td>
<td>3.0</td>
<td>FS</td>
</tr>
<tr>
<td>CDES 314</td>
<td>Intro Multimedia Dsgn &amp; Dev</td>
<td>3.0</td>
<td>FA</td>
</tr>
<tr>
<td>CDES 222</td>
<td>Advanced WWW Design &amp; Publish</td>
<td>3.0</td>
<td>FS</td>
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<tr>
<td>CDES 323</td>
<td>Human Interface Design</td>
<td>3.0</td>
<td>FA</td>
</tr>
<tr>
<td>CDES 333</td>
<td>Graphic Visualization</td>
<td>3.0</td>
<td>FS</td>
</tr>
<tr>
<td>CDES 366</td>
<td>Field Video Production</td>
<td>3.0</td>
<td>FS</td>
</tr>
<tr>
<td>CDES 466</td>
<td>Studio Video Production</td>
<td>3.0</td>
<td>FS</td>
</tr>
<tr>
<td>KINE 318</td>
<td>3-D Desktop Video Applications</td>
<td>3.0</td>
<td>FS</td>
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<tr>
<td>KINE 524</td>
<td>Biomechanical Analysis</td>
<td>3.0</td>
<td>FS</td>
</tr>
<tr>
<td>THEA 112</td>
<td>Acting for Non-Majors</td>
<td>3.0</td>
<td>FS *</td>
</tr>
<tr>
<td>THEA 260</td>
<td>Intermediate Acting I</td>
<td>3.0</td>
<td>FS</td>
</tr>
<tr>
<td>THEA 130</td>
<td>THEA 140, either THEA 160 or THEA 160X</td>
<td>3.0</td>
<td>FS</td>
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<tr>
<td>THEA 371</td>
<td>Lighting Design</td>
<td>3.0</td>
<td>FA</td>
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<tr>
<td>THEA 112</td>
<td>THEA 170, THEA 170X, THEA 205, THEA 250</td>
<td>3.0</td>
<td>FA</td>
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Corequisites: Concurrent enrollment in THEA 205 for lighting crew is required.

THE OPTION IN TECHNICAL: 27 units

7 courses required:

<table>
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<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
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</thead>
<tbody>
<tr>
<td>CSCI 112</td>
<td>Programming and Algorithm II</td>
<td>3.0</td>
<td>FS</td>
</tr>
<tr>
<td>CSCI 221</td>
<td>Assembly Language Programming</td>
<td>3.0</td>
<td>FS</td>
</tr>
<tr>
<td>CSCI 311</td>
<td>Algorithms and Data Structures</td>
<td>3.0</td>
<td>FS</td>
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<tr>
<td>CSCI 320</td>
<td>Computer Architecture</td>
<td>3.0</td>
<td>FS</td>
</tr>
<tr>
<td>CSCI 330</td>
<td>Software Engineering</td>
<td>3.0</td>
<td>FS WP</td>
</tr>
<tr>
<td>CSCI 566</td>
<td>Computer Graphics Programming</td>
<td>3.0</td>
<td>FA</td>
</tr>
<tr>
<td>MATH 109</td>
<td>Survey of Calculus</td>
<td>3.0</td>
<td>FS *</td>
</tr>
</tbody>
</table>

Prerequisites: Completion of ELM requirement. This course is not intended for majors in mathematics, physics, chemistry, or engineering.

Applied Computer Graphics Electives

2 courses selected from:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>APCG 360</td>
<td>Web Page Design</td>
<td>3.0</td>
<td>FA</td>
</tr>
<tr>
<td>CDES 214</td>
<td>Computer Graphics</td>
<td>3.0</td>
<td>FS</td>
</tr>
<tr>
<td>CDES 216</td>
<td>Introduction to Audio in Media</td>
<td>3.0</td>
<td>FS</td>
</tr>
<tr>
<td>CDES 314</td>
<td>Intro Multimedia Dsgn &amp; Dev</td>
<td>3.0</td>
<td>FA</td>
</tr>
<tr>
<td>CDES 222</td>
<td>Advanced WWW Design &amp; Publish</td>
<td>3.0</td>
<td>FS</td>
</tr>
<tr>
<td>CDES 323</td>
<td>Human Interface Design</td>
<td>3.0</td>
<td>FA</td>
</tr>
</tbody>
</table>

Prerequisites: CDES 222.

THE OPTION IN PRODUCTION: 22 units

13 units required:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>APCG 345</td>
<td>Adv Animation Pre-Production</td>
<td>3.0</td>
<td>FS</td>
</tr>
<tr>
<td>CSCI 389</td>
<td>Industry Internship</td>
<td>1.0-3.0</td>
<td>FS</td>
</tr>
<tr>
<td>CSCI 389</td>
<td>Special Problems</td>
<td>1.0-3.0</td>
<td>FS</td>
</tr>
</tbody>
</table>

Prerequisites: Faculty permission.

CSCI 399 must be taken once for 1 unit and a second time for 3 units.

General Education Requirements: 48 units

See “General Education Requirements” in The University Catalog.

Writing proficiency in the major is a graduation requirement and may be demonstrated through satisfactory completion of a course in your major which has been designated as the Writing Proficiency (WP) course for the semester in which you take the course. Students who earn below a C- are required to repeat the course and earn a C- or better to receive WP credit. See The Class Schedule for the designated WP courses for each semester. You must pass ENGL 130 (or its equivalent) with a C- or better before you may register for a WP course.

Course Requirements for the Major: 66-72 units

The following courses, or their approved transfer equivalents, are required of all candidates for this degree. Additional required courses, depending upon the selected option or advising pattern, are outlined following the degree core program requirements.

DEGREE CORE PROGRAM: 18 units

6 courses required:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
<th>Type</th>
</tr>
</thead>
</table>
| APCG 110    | Computer-Assisted Art I                   | 3.0   | FS *
| APCG 112    | Digital Photography                       | 3.0   | FS   |
| APCG 117    | Concept Design & Storyboarding            | 3.0   | FS   |
| APCG 330    | 3-D Computer Modeling                     | 3.0   | FS   |
| APCG 340    | Computer Animation                        | 3.0   | FS   |
| CSCI 111    | Programming and Algorithms I              | 3.0   | FS   |

Prerequisites: APCG 110 or previous computer graphics experience.

Prerequisites: At least one year of high school algebra and strong computer skills or CSCI 101.

Major Option Course Requirements: 22-27 units

The following courses, or their approved transfer equivalents, are required dependent upon the option chosen. Students must select one of the following options for completion of the major course requirements.
Computer Science

CDES 333 Graphic Visualization 3.0 FS
Prerequisites: CDES 230 for CDES majors. Other majors require instructor permission.

CDES 366 Field Video Production 3.0 FS
Prerequisites: CDES 206, CDES 216; CDES 141, CDES 261 (both with a grade of C or higher),

CDES 414 Adv Multimedia Dsgn & Develop 3.0 SP
Prerequisites: CDES 314.

CDES 466 Studio Video Production 3.0 FS
Prerequisites: CDES 366.

CDES 468 Video Production Workshop 3.0 FA
Prerequisites: CDES 366.

CSCI 465 Web Programming Fundamentals 3.0 SP
Prerequisites: CSCI 311.

CSCI 467 Graphical User Interface Des 3.0 FA
Prerequisites: CSCI 311.

CSCI 545 Advanced Animation Production 3.0 FS
Prerequisites: APGC 110, APGC 330, APGC 340.

CSCI 567 Graphical User Interface Impl 3.0 SP
Prerequisites: CSCI 311.

KINE 524 Biomechanical Analysis 3.0 FS
Prerequisites: KINE 322 and basic computer literacy.

THEA 112 Acting for Non-Majors 3.0 FS *
Prerequisites: THEA 130, THEA 140, either THEA 160 or THEA 112H, THEA 160X.

THEA 371 Lighting Design 3.0 FA
Prerequisites: THEA 121, THEA 170, THEA 170X, THEA 205, THEA 250.
Corequisites: Concurrent enrollment in THEA 205 for lighting crew is required.

Electives Requirement:
To complete the total units required for the bachelor’s degree, select additional elective courses from the total university offerings. You should consult with an adviser regarding the selection of courses which will provide breadth to your university experience and possibly apply to a supportive second major or minor.

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

A grade of C- or better is required in all computer science courses required for the major.

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

SUPPLEMENTAL PROGRAM REQUIREMENTS: 26-27 units

Select one of the two following supplemental programs, Art Studio or Communication Design, either of which will also fulfill all requirements for the degree minor indicated.

Art Studio Program: 27 units
The following courses or their approved transfer equivalents also fulfill requirements for the Minor in Art Studio offered by the Department of Art and Art History.

5 courses required:
ARTS 101 Art History Survey 3.0 FS *
ARTS 125 Basic Drawing 3.0 FS
ARTS 126 Basic Drawing 3.0 FS
Prerequisites: ARTS 125 or faculty permission.

ARTS 240 Intro to Fine Art Photography 3.0 FS

1 course selected from:
ARTS 122 Color Theory 3.0 FS
ARTS 123 Design 3.0 FS

1 course selected from:
ARTS 227 Introduction to Painting 3.0 FS
ARTS 230 Introduction to Printmaking 3.0 FS
ARTS 260 Introduction to Ceramics 3.0 FS
ARTS 270 Introduction to Sculpture 3.0 FS
ARTS 290 Introduction to Fiber Art 3.0 FS

2 courses selected from:
ARTS 326 Intermediate Life Drawing 3.0 FS
Prerequisites: ARTS 125; ARTS 126; or faculty permission.

ARTS 340 Intermediate Fine Art Photography 3.0 FS
Prerequisites: Introductory photography course on the college level, or faculty permission.

ARTS 350 Intermediate Electronic Arts 3.0 FS
Prerequisites: ARTS 123, ARTS 126, ARTS 250; or faculty permission.

ARTS 371 Intermed Sculp: Mixed Media 3.0 FS
Prerequisites: ARTS 270 for art majors (sculpture emphasis) or ARTS 123 for art majors (non-sculpture); faculty permission for non-majors.

ARTS 426 Advanced Life Drawing 3.0 FS
Prerequisites: ARTS 326 or faculty permission.

ARTS 440 Advanced Fine Art Photography 3.0 FS
Prerequisites: ARTS 340.

ARTS 470 Advanced Sculpture 3.0 FS
Prerequisites: ARTS 371, ARTS 372, or ARTS 373; or faculty permission.

ARTS 450 Advanced Electronic Arts 3.0 FS
Prerequisites: ARTS 350 or faculty permission.

ARTS 490 Advanced Fiber 3.0 FS
Prerequisites: ARTS 390 or faculty permission.

Communication Design Program: 26-27 units
The following courses or their approved transfer equivalents also fulfill requirements for a Minor in Communication Design offered by the Department of Communication Design.

3 courses required:
CDES 101 Introduction to Communication 3.0 FS
This course is also offered as JOUR 101.

CDES 102 Principles of Comm Design 3.0 FS

CDES 307 Technology and Communication 3.0 FS
Prerequisites: CDES 102.

3 courses selected from:
CDES 103 Writing for Electronic Media 3.0 FS
Prerequisites: ENGL 130.

CDES 141 Media Aesthetics 3.0 FS

CDES 241 North American Cinema 3.0 SP

CDES 242 History of Documentary Film 3.0 FA

CDES 261 Found of Electronic Media 3.0 FS

CDES 281 Print as Digital Output Medium 3.0 FS

CDES 315 Electronic Media Economics 3.0 FA
Prerequisites: CDES 261 (with a grade of C or higher) or faculty permission.

CDES 331 History of Graphic Design 3.0 SP

CDES 341 American Radio and Television 3.0 SP
Prerequisites: Junior standing, CDES 103, CDES 206, CDES 216; CDES 141, CDES 261 (both with a grade of C or better); faculty permission.

CDES 362 Media Performance 3.0 FA
Prerequisites: CDES 103, CDES 216.

CDES 363 Broadcast News 3.0 FS
Prerequisites: CDES 103, CDES 216.

CDES 368 Public Affairs Programming 3.0 FA
Prerequisites: CDES 103, CDES 216; CDES 261 (with a grade of C or higher).

3 courses selected from:
Select three additional courses from Applied Computer Graphics Electives in your chosen option.

THE MINOR IN COMPUTER SCIENCE
Course Requirements for the Minor: 21 units
The following courses, or their approved transfer equivalents, are required of all candidates for this minor.

Lower-Division: 9 units
3 courses required:
CSCI 111 Programming and Algorithms I 3.0 FS
Prerequisites: At least one year of high school algebra and strong computer skills or CSCI 101.

CSCI 112 Programming and Algorithm II 3.0 FS
Prerequisites: Grade of C- or better in CSCI 111 (or EECE 135 for engineering majors).

CSCI 221 Assembly Language Programming 3.0 FS
Prerequisites: CSCI 112.

Upper-Division: 12 units
2 courses required:
CSCI 311 Algorithms and Data Structures 3.0 FS
Prerequisites: Grade of C- or better in CSCI 112.

CSCI 320 Computer Architecture 3.0 FS
Prerequisites: CSCI 221.

6 units selected from:
Any upper-division Computer Science (CSCI) courses except CSCI 389, CSCI 399, and CSCI 490.
THE MASTER OF SCIENCE IN COMPUTER SCIENCE

Course Requirements for the Master's Degree: 30 units

Continuous enrollment is required. A maximum of 9 semester units of computer science and 6 semester units of computer science related transfer credit may be applied toward the degree.

Graduate Time Limit: All requirements for the degree are to be completed within seven years of the end of the semester of enrollment in the oldest course applied toward the degree. See "Graduate Education" in The University Catalog for complete details on general degree requirements.

Prerequisites for Admission to Conditionally Classified Status:

1. Satisfactory grade point average as specified in "Admission to Master's Degree Programs" in The University Catalog.
2. Approval by the department and the Office of Graduate Studies.
3. An acceptable baccalaureate from an accredited institution, or an equivalent approved by the Office of Graduate Studies.
4. Completion of background preparation equivalent to:
   (a) CSCI 311 (Algorithms and Data Structures)
   (b) CSCI 320 (Computer Architecture)
   (c) MATH 120, MATH 121, MATH 314, MATH 317, or equivalents.

Prerequisites for Admission to Classified Status:

In addition to any requirements listed above:

1. Completion of background preparation equivalent to the following undergraduate courses:
   (a) CSCI 330 (Software Engineering)
   (b) CSCI 340 (Operating Systems Programming)
2. All required undergraduate Computer Science courses must be taken for a letter grade, and a grade of C or better must be earned in each course. Students are expected to complete these courses immediately as a matter of reasonable progress toward the master's degree.

Advancement to Candidacy:

In addition to any requirements listed above:

1. Classified graduate standing and completion of, or enrollment in, the graduate core courses.
2. Development of an approved program in consultation with the Graduate Coordinator.
3. If the thesis or project option is chosen, formation of the graduate advisory committee in consultation with the Graduate Coordinator.

Requirements for the MS Degree in Computer Science:

Completion of all requirements as established by the department graduate committee, the graduate advisory committee, and the Office of Graduate Studies, to include:

1. Completion of an approved program consisting of 30 units of 400/500/600-level courses as follows:
   (a) At least 24 units in the discipline of Computer Science.
   (b) Completion of the graduate core courses:
      CSCI 620 Computer Architecture 3.0 SP
      CSCI 630 Software Engineering 3.0 FA
      CSCI 640 Operating Systems 3.0 SP
      CSCI 650 Design/Analysis of Algorithms 3.0 FA
      Prerequisites: CSCI 311 and classified graduate standing.
   (c) At least 18 of the units required for the degree in 600-level courses.
   (d) Not more than 9 semester units of transfer and/or extension credit (correspondence courses and U.C. extension course work are not acceptable).
2. Completion and final approval of one of the following three plans as approved by the Graduate Coordinator:
   (a) Examination Plan.
      This plan includes 30 units of in-class course work, and a passing score on the written comprehensive examination covering the core. The examination may be taken a maximum of two times. Failure on the second attempt will result in dismissal from the graduate program in computer science.
   (b) Project Plan.
      The project plan includes 27 units of in-class course work and 3 units of project preparation (CSCI 699P). The project must reflect a personal in-depth study of a topic in an applied area of computer science. A formal written description of the project must be submitted to the Office of Graduate Studies for approval and access to the library.
   (c) Thesis Plan.
      This plan includes 24 units of in-class course work and 6 units of thesis research and preparation (CSCI 699T). Research may be theoretical or applied, but must reflect a personal in-depth study into an approved topic. This plan requires a formal research thesis which must be submitted to the Office of Graduate Studies for approval and access to the library.
3. Approval by the Graduate Coordinator and the Graduate Coordinators Committee on behalf of the faculty of the university.

Graduate Literacy Requirement:

Writing proficiency is a graduation requirement.

Computer Science students will demonstrate their writing competence through successfully completing a departmentally administered examination given at the beginning of each semester or successful completion (B- higher) of an approved technical writing course. The writing examination may be taken a maximum of two times. Consult the Graduate Coordinator for specific information.

Graduate Grading Requirements:

All courses in the major (with the exceptions of Independent Study - 597/697, Comprehensive Examination - 696, Master’s Project - 699P, and Master’s Thesis - 699T) must be taken for a letter grade, except those courses specified by the department as ABC/No Credit (400/500-level courses), AB/No Credit (600-level courses), or Credit/No Credit grading only. A maximum of 10 units combined of ABC/No Credit, AB/No Credit, and Credit/No Credit grades may be used on the approved program (including 597/697, 696, 699P, 699T, and courses outside the major). While grading standards are determined by individual programs and instructors, it is also the policy of the university that unsatisfactory grades may be given when work fails to reflect achievement of the high standards, including high writing standards, expected of students pursuing graduate study.

Students must maintain a minimum 3.0 grade point average in each of the following three categories: all course work taken at any accredited institution subsequent to admission to the master's program; all course work taken at CSU, Chico subsequent to admission to the program; and all courses on the approved master’s degree program.

In addition, students may not count more than two courses in which they receive a grade of C toward the approved program.

The Faculty

Teaching Faculty

Judith Challengcr, 1999, Assist Professor, PhD, U.CSC.
Leonard W. Fisk, 1976, Professor, PhD, UC Irvine.
Tyrone Henry, 2001, Assist Professor, PhD, U Arizona.
Ralph Hilzer, 1985, Interim Chair, Professor, MS, Naval PG.
Seung-Bae Im, 1982, Professor, PhD, So. Meth U.
Benjie Juliano, 1998, Assoc Professor, PhD, Florida St.
Anne M. Keuneke, 1989, Professor, PhD, Ohio St U.
Clement H. Luk, 1979, Professor, MS, SUNY Buffalo.
Reene Renner, 1998, Assoc Professor, PhD, Florida St.
Melody J. Stapleton, 1981, Professor, PhD, UCR.
Clarke Steinback, 1998, Assoc Professor, PhD, U.CSC.
Richard Anthony Vertolli, 1988, Lecturer A, MS, CSU Chico.

Non-Teaching Faculty

Abdel-Moaty M. Fayek, 1985, Assoc Professor, MS, CSU Chico.

Emeritus Faculty

Robert L. Britton, 1969, Professor Emeritus, PhD, U Utah.
Rock C. Huntsinger, 1971, Professor Emeritus, PE, PhD, Montana State Univ.
Orlando S. Madrigal, 1970, Professor Emeritus, PhD, Texas A&M.
James R. Pinkert, 1977, Professor Emeritus, PhD, U WI.
Wesley Gary Sitton, 1967, Professor Emeritus, PhD, Univ of Alberta.
Computer Science

Applied Computer Graphics Course Offerings

Please see the section on “Course Description Symbols and Terms” in The University Catalog for an explanation of course description terminology and symbols, the course numbering system, and course credit units. All courses are lecture and discussion and employ letter grading unless otherwise stated. Some prerequisites may be waived with faculty permission. Many syllabi are available on the Chico Web.

APCG 110 Computer-Assisted Art I 3.0 Fa/Spr
Provides an introduction to computer graphics and art. Students use the computer as a tool for creating static and animated images. Basic instruction in design and color relationships is provided. The writing component may include research reports from current graphics publications and/or attendance and discussion of art exhibitions. 1.0 hour discussion, 4.0 hours activity. This is an approved General Education course. Formerly CSCI 040.

APCG 112 Digital Photography 3.0 Fa/Spr
An introduction to digital photography that explores the composition and aesthetics of photography. Emphasis is on concepts and techniques of image manipulation software. The course addresses printing and displaying photographic portfolios. 2.0 hours lecture, 2.0 hours activity. Formerly CSCI 040.

APCG 117 Concept Design and Storyboarding 3.0 Fa/Spr
An in-depth look into pre-production process as it directly pertains to storyboard creation, character development and design, pre-visualization techniques, and principles of concept design. 2.0 hours lecture, 2.0 hours activity. Formerly APCG 046.

APCG 330 3-D Computer Modeling 3.0 Fa/Spr
Prerequisites: APCG 110 or previous computer graphics experience. This course uses 3-D modeling and animation software in developing 3-D computer models and creating presentations of those models in story-telling still scenes. The tools, techniques, and topics studied include basic and advanced 3-D modeling tools, 3-D scene layout, lighting, texturing, and rendering. 1.0 hour discussion, 4.0 hours activity. Formerly CSCI 140.

APCG 340 Computer Animation 3.0 Fa/Spr
Prerequisites: APCG 110 and APCG 330 or permission of instructor. For both majors and non-majors. The concepts of computer imaging and animation are taught in this project-based class. Focus is on the principles of animation and how they apply to current computer animation techniques. This class emphasizes both creative and technical skills. 1.0 hour discussion, 4.0 hours activity. Formerly APCG 240.

APCG 345 Advanced Animation Pre-Production and Story Development 3.0 Fa/Spr
Prerequisites: ENGL 130 (or its equivalent) with a grade of C- or higher. APCG 117 Concentration on story development as it relates to Computer Animation. Students write a treatment, script, and storyboard for an animation project. Emphasis is placed on understanding the story structure, writing interesting dialogue and developing an in-depth storyboard. The course gives students a practical approach to creating the pre-production component of an animated "short." Formerly APCG 141.

APCG 360 Web Page Design 3.0 Fall
Prerequisites: CSCI 111. This course focuses on the study of design and implementation issues for Web page creation and maintenance from the perspective of programming and writing code. Topics include page purpose, content, audience, navigation, speed, style, and maintenance issues, mark-up language tags, style sheets, dynamic mark-up language, scripting. Students are required to work collaboratively to produce functional sites and make verbal presentations. 2.0 hours lecture, 2.0 hours activity. Formerly APCG 145.

APCG 398 Special Topics 1.0-3.0 Fa/Spr
This course is for special topics offered for 1.0-3.0 units. Typically the topic is offered on a one-semester-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. Formerly APCG 198.

APCG 498 Special Topics 1.0-3.0 Fa/Spr
This course is for special topics offered for 1.0-3.0 units. Typically the topic is offered on a one-semester-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. Formerly APCG 298.

Computer Science Course Offerings

Please see the section on “Course Description Symbols and Terms” in The University Catalog for an explanation of course description terminology and symbols, the course numbering system, and course credit units. All courses are lecture and discussion and employ letter grading unless otherwise stated. Some prerequisites may be waived with faculty permission. Many syllabi are available on the Chico Web.

CSCI 100 Computer Literacy 3.0 Fa/Spr
Introduction to the computer for non-computer science students. History of the computer, review of hardware, software, and a range of computer applications are considered. The social impact and future of computers for communication systems are discussed. An integrated software package for word processing, spreadsheets, databases, and presentation is used. 2.0 hours lecture, 2.0 hours activity. Special fee required; see The Class Schedule. Formerly CSCI 010. CAN CSCI 2.

CSCI 101 Introduction to Computer Science 3.0 Fa/Spr
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, 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. 2.0 hours discussion, 2.0 hours activity. Formerly CSCI 014.

CSCI 110 Introduction to Applications Programming 3.0 Fa/Spr
Prerequisites: CSCI 111. This course introduces programming to computer programmers and systems analysts using an integrated graphical development environment. Event-driven, visual, and object-oriented programming concepts are presented. Course emphasis is on the total program development process — problem analysis, design, coding, testing, debugging, and maintenance. Programming projects involve common business problems that require data entry, display of calculated results, reports, conditional testing, arithmetic operations, array processing, data validation, searching, sorting, reading and writing files, database. 2.0 hours discussion, 2.0 hours activity. Formerly CSCI 054.

CSCI 111 Programming and Algorithms I 3.0 Fa/Spr
Prerequisites: At least one year of high school algebra and strong computer skills or CSCI 101. A first-semester object-oriented programming course, providing an overview of computer systems and an introduction to problem solving, object-oriented software design, and programming. 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. 2.0 hours discussion, 2.0 hours activity. Formerly CSCI 015A. CAN CSCI 22.

CSCI 112 Programming and Algorithms II 3.0 Fa/Spr
Prerequisites: Grade of C- or better in CSCI 111 (or IEECE 135 for engineering majors). 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 will be expected to design, implement, test, and analyze a number of programs. 2.0 hours discussion, 2.0 hours activity. Formerly CSCI 015B. CAN CSCI 24.

CSCI 117 Programming Problem Session 1.0 Fa/Spr
Prerequisites: Concurrent enrollment in CSCI 111. Designed to supplement CSCI 111 with additional applications and extended explanations of concepts encountered in programming. Provides the student with the opportunity for additional assistance in basic programming skills. 2.0 hours activity. Credit/no credit grading only. Formerly CSCI 015X.
CSCI 118 Programming Problem Session 1.0 Fa/Spr
Prerequisites: Concurrent enrollment in CSCI 112. Designed to supplement CSCI 112 with additional applications and extended explanations of concepts encountered in programming. Provides the student with the opportunity for additional assistance in basic programming skills. 2.0 hours activity. Credit/no credit grading only. Formerly CSCI 015Y.

CSCI 144 Introduction to the UNIX Operating System 3.0 Fa/Spr
This course is designed as a comprehensive introduction to the UNIX operating system. It leads the student through logging in, introductory and advanced levels of the visual editor (vi), file management, the directory structure, how UNIX handles files and processes, job control, process monitoring, shell scripts, basic shell utilities, and power utilities. 2.0 hours discussion, 2.0 hours activity. Formerly CSCI 057.

CSCI 221 Assembly Language Programming 3.0 Fa/Spr
Prerequisites: CSCI 112. 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. 2.0 hours discussion, 2.0 hours activity. Formerly CSCI 051A. CAN CSCI 110.

CSCI 301 Computer's Impact on Society 3.0 Fa/Spr
Prerequisites: Junior standing. 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. This is an approved General Education course. Formerly CSCI 110.

CSCI 350 Project Requirements, Design, and Testing 3.0 Fa/Spr
Prerequisites: CSCI 112 or ECEE 221. Students are introduced to methodologies used to specify system descriptions, Hardware and software documentation standards are described. Methodologies for modeling systems and development of presentation materials are discussed, and students are required to make both written and oral presentations. 2.0 hours discussion, 2.0 hours activity. Formerly CSCI 180. This course is also offered as ECEE 335.

CSCI 311 Algorithms and Data Structures 3.0 Fa/Spr
Prerequisites: Grade of C- or better in CSCI 112. 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. 2.0 hours discussion, 2.0 hours activity. Formerly CSCI 151.

CSCI 313H Mind in the Machine - Honors 3.0 Spring
Prerequisites: Acceptance into the Honors Program, faculty permission. An Honors seminar that explores the psychological, philosophical, social, biological, and technical aspects of machine "minds." Explores core issues within a subset of the disciplines that comprise the cognitive sciences, including artificial intelligence, philosophy, and psychology. Readings and discussions focus on theories of artificial intelligence and classic themes in human cognition and philosophy, such as determinism, consciousness, free-will, and the mind-body problem. The course focuses on increasing one's capability to express beliefs and evaluate arguments concerning various issues. This is an approved General Education course. Formerly CSCI 116H. This course is also offered as PSYC 332H.

CSCI 318 Programming Languages 3.0 Fa/Spr
Prerequisites: CSCI 112. 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 functional programming. Formerly CSCI 150.

CSCI 317 Linear Programming Applications 3.0 Inquire
Prerequisites: CSCI 112 equivalent. Mathematical optimization and managerial decision techniques. Simplex method with applications, transportation problems, assignment problems, integer programming, network algorithms, and inventory models. 2.0 hours discussion, 2.0 hours activity. Formerly CSCI 160.

CSCI 320 Computer Architecture 3.0 Fa/Spr
Prerequisites: CSCI 221. The course introduces basic digital logic design techniques and integrates the topics of assembly language programming, computer organization, and computer design. Topics include the design of the arithmetic and logic unit (ALU), hardware multiplication and division, multiple clock cycle implementations, pipelined implementations; hazard detection and forwarding; design of a memory hierarchy, system busses and the design of a direct memory access (DMA) controller, cache consistency in multiprocessor systems, and implementation of a snooping cache. Formerly CSCI 171.

CSCI 323 Systems Architecture 3.0 Inquire
Prerequisites: CSCI 311, CSCI 320. Concurrent enrollment in CSCI 340 is recommended. Definition of problems relating to interconnecting processors and peripherals in computer systems. Channel and bus structures, bandwidth computations, performance evaluation, feasibility studies, and methods of systems analysis. This is a writing proficiency, WP, course; a grade of C- or better certifies writing proficiency for majors. Formerly CSCI 172.

CSCI 330 Software Engineering 3.0 Fa/Spr
Prerequisites: CSCI 311, ENGL 130 (or its equivalent) with a grade of C- or higher. Special problems in the development of large software systems. Software life cycle, requirements analysis, structural design, implementation, costing, standards, verification, and validation. A group project is required. This is a writing proficiency, WP, course; a grade of C- or better certifies writing proficiency for majors. Formerly CSCI 112.

CSCI 340 Operating Systems Programming 3.0 Fa/Spr
Prerequisites: CSCI 311, CSCI 320. Operating system fundamentals, including history, process and thread management, concurrency with semaphores and monitors, deadlocks, storage management, file systems, I/O, and distributed systems. 2.0 hours discussion, 2.0 hours activity. Formerly CSCI 152.

CSCI 344 UNIX Power Utilities and Shell Programming 3.0 Fall
Prerequisites: CSCI 311. Operating systems, communication protocols, and the supporting network hardware and software. The course emphasizes the hands-on experience of network management in a laboratory environment. 2.0 hours discussion, 2.0 hours activity. Formerly CSCI 157.

CSCI 346 Introduction to Computer Networks and Network Management 3.0 Fa/Spr
Prerequisites: CSCI 111. This course is an introduction to basic knowledge of networking technologies and network management concepts, including major network operating systems, communication protocols, and the supporting network hardware and software. 2.0 hours discussion, 2.0 hours activity. Formerly CSCI 178.

CSCI 351 Numerical Methods Programming 3.0 Inquire
Prerequisites: CSCI 112 or ECEE 125; MATH 220. Scientific programming methods, solution of simultaneous linear and non-linear equations, iterative techniques, matrix methods, error analysis, development of specific and general algorithms. 2.0 hours discussion, 2.0 hours activity. Formerly CSCI 165.
CSCI 380  Machines, Brains, and Minds  3.0 Fa/Spr
Prerequisites: Junior standing, faculty permission.
An examination of the emergence of artificial mind in machines, with special attention to related issues in the philosophy of mind and cognitive science. This is an approved General Education course. Formerly CSCI 122.

CSCI 381  Language, Intelligence, and Computation  3.0 Fall
This course presents a practically based treatment of artificial intelligence, and a general introduction of technical issues associated with the development of intelligent systems. The course addresses issues of knowledge representation and natural language processing in particular, from a computational perspective. Students write programs to perform simple analyses of natural language and logical reasoning. Students also explore the limits of computation, using practical and theoretical approaches. 2.0 hours lecture, 2.0 hours activity. This is an approved General Education course. Formerly CSCI 123.

CSCI 389  Industry Internship  1.0-3.0 Fa/Spr
Course. Formerly CSCI 123.

CSCI 399  Special Problems  1.0-3.0 Fa/Spr
Prerequisites: Faculty permission.
This course is a special topic offered for 1.0-3.0 units. You may take this course more than once for a maximum of 4 units. Credit/no credit grading only. Formerly CSCI 189.

CSCI 444  Fundamental UNIX System Administration  3.0 Spring
Prerequisites: CSCI 344 or permission of instructor.
This course guides students through the fundamental responsibilities of UNIX system administration. Topics include file system monitoring, file and directory archiving, user account management, shutdown and rebooting sequences, system backups, system log responsibilities, and basic system security. Projects focus on the creation of shell scripts to automate system administration tasks. 2.0 hours discussion, 4.0 hours activity. Formerly CSCI 257.

CSCI 465  Web Programming Fundamentals  3.0 Spring
Prerequisites: CSCI 311.
This course is a comprehensive introduction to the major technologies used in the construction of interactive, client-server Web sites. Emphasis is placed on the protocols and standards used for exchanging data between the client and server programs. Both client and server side implementation methods are discussed using programming and scripting languages for the creation of dynamic Web pages. The use of direct client-to-server network communication, performance implications for implementation technologies, and techniques for increasing Web site security are discussed. Formerly CSCI 245.

CSCI 467  Graphical User Interface Design  3.0 Fall
Prerequisites: CSCI 311.
Design of graphical user interfaces. Topics include issues, theories, principles, and guidelines in human-computer interaction; user interface design considerations and strategies; and techniques for evaluating user interfaces. Formerly CSCI 232.

CSCI 470  Database Management  3.0 Fa/Spr
Prerequisites: CSCI 312.
This course provides an introduction to the theory and methodology for database design and implementation. Topics may include a survey/lecture component as well as a project component. The survey component covers entity-relationship modeling, relational algebra and calculus theories, data definition and data manipulation languages such as SQL, file structures, transactions, concurrency control, recovery, tuning and optimization, and object-oriented databases. The course entails requirements definition, design, and implementation of a database application. Formerly CSCI 273.

CSCI 490  Directed Programming Experience  1.0-3.0 Fa/Spr
Prerequisites: CSCI 311, faculty permission.
This course is special topic programming experience offered for 1.0-3.0 units. You must register directly with a supervising faculty member. Directed experience in programming systems and applications, weekly conferences, limited to a maximum of 4 units during degree program. Projects may consist of from one to 10 students working on software development teams. You may take this course more than once for a maximum of 3.0 units. Credit/no credit grading only. Formerly CSCI 190.

CSCI 498  Advanced Topics in Computer Science  1.0-3.0 Fa/Spr
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. Credit/no credit grading only. Formerly CSCI 298.

CSCI 499H  Honors Research Project/Thesis  3.0 Fa/Spr
Prerequisites: Open only to majors in the major.
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. Formerly CSCI 299H.

CSCI 511  Object-Oriented Programming  3.0 Fall
Prerequisites: CSCI 311.
This class focuses on object-oriented programming using large class libraries and interactive programming environments. The course centers on good object-oriented design and implementation by addressing these issues with examples throughout the semester. Students will experience the development environment and extensively use the library of at least one object-oriented programming language. Topics include the proper use of inheritance and model/view/controller distinctions, various issues concerning multithreaded systems, I/O, exception handling, and distributed computing. Formerly CSCI 215.

CSCI 515  Compiler Design  3.0 Fa/Spr
Prerequisites: CSCI 312.
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. Formerly CSCI 250.

CSCI 520  Digital Logic Design Theory  3.0 Spring
Prerequisites: CSCI 320.
An introduction to computer design for digital systems. Understanding the problem and developing a systematic solution for the system. The course covers state machines and state diagram theories, combinational circuits, and sequential control circuits are emphasized. Students will design and simulate useful digital systems using a Computer-Assisted design tool. Formerly CSCI 280.

CSCI 533  Object-Oriented Analysis & Design  3.0 Spring
Prerequisites: Object-oriented programming experience.
This class is complementary to classes in Object-Oriented Programming (OOP). The focus will be on object-orientation in the earlier phases of the software life cycle: object-oriented analysis (OOA), which creates models of the world based on objects and object-oriented design (OOD), which relates specifically to the design of software. The close relationship between OOA, OOD, and OOP will be examined. Use of the Unified Modeling Language (UML) and Design Patterns will be applied. Formerly CSCI 211.

CSCI 540  Multi-User Operating Systems  3.0 Fall
Prerequisites: CSCI 340 or permission of instructor.
Analysis of multi-user operating systems, to include an in-depth study of current techniques used by a specific multi-user OS. Formerly CSCI 272.

CSCI 542  Systems Design  3.0 Fall
Prerequisites: CSCI 340.
Methods related to the functional design of complex computer systems. Emphasis is on the project-team design approach. Operational criteria, system feasibility, requirements, and cost tradeoffs. Integration of personnel, equipment, hardware, and software. Formerly CSCI 270.

CSCI 545  Advanced Animation Production  3.0 Fa/Spr
Prerequisites: APCG 110, APCG 330, APCG 340.
The computer animation production process is taught in this class. Working from a script, storyboard, and/or animatic, students complete an “animated short” with accompanying sound, music, and visual effects. Emphasis is on working as a member of a computer animation team, similar to a real-world production facility. 1.0 hour discussion, 4.0 hours activity. Formerly CSCI 241.

CSCI 546  Advanced Network Management  3.0 Spring
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. Formerly CSCI 277.

CSCI 547  Computer Networks  3.0 Fa/Spr
Prerequisites: CSCI 340.
Covers the concepts, vocabulary, design issues, and techniques currently used in the area of computer networks. Topics include history and evolution, transmission media, interconnection topology, carrier sense multiple access/collision avoidance (CSMA/CD) protocols, types of nodes, network interfaces, performance analysis, diagnosis and maintenance, taxonomy, bridges, and gateways. Case studies of existing state-of-the-art networks are included. Formerly CSCI 278.

CSCI 550  Theory of Computing  3.0 Fa/Spr
Prerequisites: MATH 317.
An introduction to formal languages, grammars, and automata theory with unsolvable problems. Formerly CSCI 256.
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<td>CSCI 649</td>
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<td>CSCI 650</td>
<td>Design and Analysis of Algorithms</td>
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<td>CSCI 666</td>
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<tr>
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**Computer Science**

- **CSCI 566: Computer Graphics Programming**
  - 3.0 Fall
  - Prerequisites: CSCI 311
  - 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 projection, visible surface detection, illumination models, and rendering algorithms. Formerly CSCI 231.

- **CSCI 567: Graphical User Interface Implementation**
  - 3.0 Spring
  - Prerequisites: CSCI 311
  - Implementation of graphical user interfaces using object-oriented programming. Topics include event handling, the use of color, graphics contexts, text, fonts, and dialog design. Formerly CSCI 233.

- **CSCI 570: Advanced Database Management Systems**
  - 3.0 Fall
  - Prerequisites: CSCI 470 or MINS 235
  - Course topics include database application programming using 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. 2.0 hours discussion, 2.0 hours activity. Formerly CSCI 276.

- **CSCI 580: Artificial Intelligence**
  - 3.0 Fall
  - Prerequisites: Grade of C- or better in CSCI 311
  - An introduction to the basic principles, techniques, and applications of Artificial Intelligence. Coverage includes knowledge representation, logical inference, problem solving, search algorithms, game theory, perception, learning, planning, and agent design. Students will program with AI language tools. Additional areas may include expert systems, machine learning, natural language processing, and computation vision. Formerly CSCI 223.

- **CSCI 583: Expert Systems and Applications**
  - 3.0 Spring
  - Prerequisites: CSCI 712
  - The basic concepts and techniques of expert systems. Emphasis is on the reasoning behind expert system design, practical problem solving (comparisons and use of expert system shell implementations), and advanced problem solving techniques such as those employed in machine learning and knowledge acquisition. Formerly CSCI 222.

- **CSCI 585: Robotics and Machine Intelligence**
  - 3.0 OddFa
  - This course introduces students to the field of robotics by emphasizing the task of endowing machines with intelligence. Topics include various case studies of robot architectures and algorithms that facilitate embodying a robot with behaviors that are traditionally associated with human cognition (e.g., perception, reasoning, intelligent navigation, vision, learning, etc.). Students conduct research and experiments with robotics hardware and software. 2.0 hours lecture, 2.0 hours activity. Formerly CSCI 224.

- **CSCI 611: Distributed Computing**
  - 3.0 Spring
  - Prerequisites: CSCI 511 and classified graduate standing.
  - This course focuses on distributed computing using the object-oriented paradigm, large class libraries, and the interactive programming environment. The course is designed to prepare the student to do commercial enterprise development. Topics may include object serialization, beans, multithreading, networking, remote objects, database connectivity, servlets, and client/server programming with enterprise and application servers. Formerly CSCI 315.

- **CSCI 619: Topics in Programming Language Theory**
  - 3.0 Inquire
  - Prerequisites: Classified graduate standing.
  - Further study of selected advanced topics in programming language theory as presented in recently published journals; possible emphasis on research interests and/or projects of faculty in the department. Formerly CSCI 309.

- **CSCI 620: Computer Architecture**
  - 3.0 Spring
  - Prerequisites: CSCI 320 and classified graduate standing.
  - Provides a thorough and fundamental treatment of the art of computer architecture. Topics include concepts of von Neumann architectures, methods of evaluating CPU performance, instruction-set design and examples, compiler issues, instruction pipelining, superscalar processors, methods for reduction of branch penalty, memory hierarchies, I/O systems, floating-point arithmetic, and current issues in parallel processing. Formerly CSCI 380.

- **CSCI 629: Topics in Computer Architecture**
  - 3.0 Inquire
  - Prerequisites: Classified graduate standing.
  - Further study of selected advanced topics in computer architecture as presented in recently published journals; possible emphasis on research interests and/or projects of faculty in the department. Formerly CSCI 369.

- **CSCI 630: Software Engineering**
  - 3.0 Fall
  - Prerequisites: CSCI 130 and classified graduate standing.
  - In-depth study and application of the planning, design, implementation, and management of complex software systems. Topics include requirements engineering, formal specifications, object-oriented analysis, design patterns, and peopleware. Teams of students will implement a large software project using a cutting edge software engineering approach. Formerly CSCI 312.

- **CSCI 635: Software Metrics and Control**
  - 3.0 Inquire
  - Prerequisites: Classified graduate standing.
  - Software development: planning, cost estimation, and control. Software metrics, configuration management, and quality controls. Reviews and walkthroughs. Formerly CSCI 310.

- **CSCI 639: Topics in Software Engineering**
  - 3.0 Inquire
  - Prerequisites: Classified graduate standing.
  - Further study of selected advanced topics in software engineering as presented in recently published journals; possible emphasis on research interests and/or projects of faculty in the department. Formerly CSCI 319.

- **CSCI 640: Operating Systems**
  - 3.0 Spring
  - Prerequisites: CSCI 340 and classified graduate standing.
  - In-depth study of operating systems concepts including results from recent research. Topics may include processes, threads, virtual memory, file systems, distributed computing, scheduling, protection, and communication protocols. Students may be required to implement operating system projects. Formerly CSCI 349.

- **CSCI 649: Topics in Networking**
  - 3.0 Inquire
  - Prerequisites: Classified graduate standing.
  - Further study of selected advanced topics in networking as presented in recently published journals; possible emphasis on research interests and/or projects of faculty in the department. Formerly CSCI 349.

- **CSCI 650: Design and Analysis of Algorithms**
  - 3.0 Fall
  - Prerequisites: CSCI 311, MATH 317, and classified graduate standing.
  - Algorithms from many areas of computer science will be analyzed. Topics include algorithm design techniques (such as divide-and-conquer, greedy algorithms, dynamic programming, and others), mathematical and empirical analysis of algorithms and NP-completeness. Formerly CSCI 356.

- **CSCI 655: Compiler Theory**
  - 3.0 Fall
  - Prerequisites: CSCI 515 and classified graduate standing.
  - Compile and run-time organization for major language structures such as records, arrays, and control structures. Optimization techniques include peephole, common subexpression elimination, constant folding, reduction-in-strength, code motion, loop unrolling, register tracking, generating code from trees, and generating code from DAGs. Formerly CSCI 356.

- **CSCI 668: Digital Image Processing**
  - 3.0 EvenSp
  - Prerequisites: Classified graduate standing.
  - Explores the field of digital image processing, providing an overview of its many areas of application and delving into the details of a select set of algorithms. Topics include imaging, digital images, basic image manipulation, grey level and color enhancement, neighborhood operations, the frequency domain, geometric operations, segmentation, morphological image processing, and image compression. Formerly CSCI 331.

- **CSCI 674: Distributed Database Management Systems**
  - 3.0 Inquire
  - Prerequisites: Classified graduate standing.
  - This course covers the theory, algorithms, and methods that underlie distributed database management systems. Emphasis is placed on design issues such as data decomposition and optimization, transaction management, concurrency and reliability, and current trends in distributed DBMS’s. Formerly CSCI 374.
CSCI 679  Topics in Database Systems  3.0  Inquire
Prerequisites: Classified graduate standing.
Further study of selected advanced topics in database systems as presented in recently published journals; possible emphasis on research interests and/or projects of faculty in the department. Formerly CSCI 379.

CSCI 680  Programming in Artificial Intelligence  3.0  EvenSp
Prerequisites: CSCI 580 and classified graduate standing.
This course includes writing new programs and extending previously implemented AI systems. Topics include the constructs of an AI programming language and studies in conjunction with expert system shell development, constraint propagation systems, inference engines, and others. Formerly CSCI 322.

CSCI 681  Theory of Artificial Intelligence  3.0  OddSp
Prerequisites: CSCI 580 and classified graduate standing.
An in-depth study of current techniques, applications, and issues in artificial intelligence. Suitable topics include advanced knowledge representation; natural language understanding; machine learning; theory of functional programming; cognitive science; neural networks; philosophy and artificial intelligence. Formerly CSCI 323.

CSCI 682  Topics in Artificial Intelligence  3.0  Inquire
Prerequisites: Classified graduate standing.
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. Formerly CSCI 329.

CSCI 697  Independent Study  1.0-6.0  Fa/Spr
Prerequisites: Classified graduate standing, faculty permission.
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. You may take this course more than once for a maximum of 6.0 units. Credit/no credit grading only. Formerly CSCI 398.

CSCI 698  Seminar in Advanced Topics  3.0  Fa/Spr
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. 2.0 hours discussion, 2.0 hours activity. Formerly CSCI 397.

CSCI 699P  Master's Project  1.0-6.0  Fa/Spr
Prerequisites: Classified graduate standing and completion of graduate literacy requirement.
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 Project courses earn a Credit grade upon completion. You may take this course more than once for a maximum of 6.0 units. Formerly CSCI 399P.

CSCI 699T  Master's Thesis  1.0-6.0  Fa/Spr
Prerequisites: Classified graduate standing and completion of graduate literacy requirement, faculty permission.
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. You may take this course more than once for a maximum of 6.0 units. Formerly CSCI 399T.