

The Science, Information Systems, and Digital Systems emphases are accredited by the Computing Accreditation Commission of ABET, a specialized accrediting body recognized by the Council for Higher Education Accreditation (CHEA).

Department of
Computer Science
College of Science

Science Emphasis

Information Systems Emphasis

Digital Systems Emphasis

Bioinformatics Emphasis

Information Technology Emphasis

Published May 2007

Effective for students beginning degree Summer Sem. 2007 thru Spring Sem. 2008

Admission Requirements For This Major

1. New freshmen admitted to USU in good standing qualify for admission to this major.
2. Transfer students from other institutions and from other USU majors need a 2.5 total GPA to be admitted in good standing to the Computer Science major.

The Program

The Department of Computer Science (CS) at Utah State University offers a course of study leading to the Bachelor of Science degree in Computer Science. This is a four-year program, with emphases in **Science (SC)**, **Information Systems (IS)**, **Digital Systems (DS)**, **Bioinformatics (BI)**, and **Information Technology (IT)**. The SC Emphasis is designed for those who plan to pursue scientific or technical careers, research, or graduate education in computer science. Students choosing the IS Emphasis complete courses that provide a thorough understanding of computer processes and business fundamentals. The DS Emphasis is for those interested in both the hardware and software aspects of computer systems. The BI Emphasis is designed for students who wish to pursue careers in the computer science aspects of bioinformatics. The IT Emphasis trains students in all phases of analysis, design, and implementation of information technology.

With the exception of the IT Emphasis, all majors must complete the first-year calculus sequence for scientists and engineers. Students in the SC, DS, and BI Emphases must also complete a linear algebra/differential equations course. A statistics course and courses covering the core topics in computer science are required for all emphases. In addition, for each of the five emphases, students take courses that give depth to that emphasis. In all cases, students should work closely with their advisor in order to choose those classes that best meet their educational and career goals, and that meet departmental graduation requirements.

Career Opportunities

Virtually all business, industry, and government organizations, at all levels, have increasing need for people capable of working with software. Consequently, there are outstanding employment opportunities in the computer science field. In fact, during the next decade, computer science-related occupations are expected to be the fastest-growing sector of employment for those jobs requiring a college degree. The five emphases offered through the Computer Science Department give students a variety of options in this dynamic field of employment.

Degrees and Programs Offered Through This Department

Computer Science: Bachelor of Science (BS), Bachelor of Arts (BA),
Five-year BS/MS Program, Master of Science (MS),
Master of Computer Science (MCS),
and Doctor of Philosophy (PhD)

Academic Advisement

All students should contact their academic advisor for assistance with course selection, program planning, and meeting graduation requirements. The Computer Science Department can be reached via e-mail: usucs@cs.usu.edu; via phone: (435) 797-2451; or by stopping by the office located in Main 414. All new and transfer students should contact Myra Cook, the academic advisor of the Computer Science Department, for any assistance. Contact can be made via e-mail: myra.cook@usu.edu; via phone: (435) 797-8019; or by making an appointment: Main 424.

Graduation Requirements: BS Degree in Computer Science

Minimum University Requirements*

Total credits	120
Grade point average (most majors require higher GPA)	2.00 GPA
Credits of C- or better	100
Credits of upper-division courses (#3000 or above)	40
USU credits	30
(20 of which must be upper division, including 10 required by major)	
Completion of approved major program of study	See department
Credits in minor (if required by department)	12
Credits in American Institutions (ECON 1500; HIST 1700, 2700, or 2710; POLS 1100; or USU 1300)	3
University Studies requirements	See below

*Colleges and departments may require more credits or a higher GPA. See requirements on this sheet.

University Studies Requirements for Computer Science Major

Note: Approved University Studies courses and requirements are listed in the back section of each semester's *Schedule of Classes*.

General Education Requirements (27-28 credits)

Competency Requirements (9-10 credits)

Communications Literacy (CL1 and CL2) (6 credits)

ENGL 1010 (CL1) (3 credits) or satisfactory AP, CLEP, IBO,
ACT, or SAT score

AND

ENGL 2010 (CL2) (3 credits) or satisfactory IBO score

Quantitative Literacy (QL) (3-4 credits)

For IT Emphasis: MATH 1100 (3 credits)

OR

For SC, IS, DS, and BI Emphases: MATH 1210 (4 credits)

OR

Satisfactory AP, CLEP, IBO, ACT, or SAT score

Computer and Information Literacy (6 tests, 0 credits)

Passing grade on six computer and information literacy related examinations.

Breadth Requirements (18 credits)

Select at least one approved course from each of the following six categories: **American Institutions (BAI)**⁴, **Creative Arts (BCA)**, **Humanities (BHU)**¹, **Life Sciences (BLS)**, **Physical Sciences (BPS)**, and **Social Sciences (BSS)**. At least two of the six breadth courses must be University Studies courses with a **USU prefix** (excluding USU 1000, 1010, 1100, 3330, 4900, and 6900). (CLEP or AP credit, where approved, may be used.)

Depth Education Requirements

Communications Intensive (CI) (2 courses)

CS 2450 (3 cr) and SPCH 1020 (3 cr) will meet this requirement.

Quantitative Intensive (QI) (1 course)

CS 1410 (3 cr) will meet this requirement.

Depth Course Requirements (2 courses)²

Select at least one approved 3000-level or above course from each of the following two categories: **Humanities and Creative Arts (DHA)**³ and **Social Sciences (DSS)**.

¹The Breadth Humanities (BHU) requirement may be fulfilled by selecting PHIL 1120 or 2400 (see section E, *Ethics and Social Issues*).

²To meet departmental requirements, students must complete *one additional* advisor-approved Breadth or Depth course in Social Sciences, Humanities, or Creative Arts.

³The Depth Humanities and Creative Arts (DHA) requirement may be fulfilled by selecting *either* PHIL 3520 *or* PHIL 4540 (see section E, *Ethics and Social Issues*).

⁴ECON 1500, which is required for the IS and IT emphases, meets this requirement.

College and Departmental Science Requirements

A. Bachelor of Science (BS) Degree Core Requirements (8-12 credits)

Every Bachelor of Science degree candidate in the College of Science must complete an approved science course sequence. Furthermore, the Computer Science Department has an *additional* science requirement for all emphases *except* the IT Emphasis. For specific information on college and departmental science requirements, see sections B and C under the heading *Computer Science Major Core Requirements* printed below.

B. Changes in Graduation/Catalog Requirements

Students who can complete a baccalaureate degree within seven years of enrollment at USU can qualify for graduation by meeting (1) the General Education/University Studies requirements in effect when they initially enrolled and (2) the major requirements in effect when they officially declared their major, even though there may have been changes in General Education/University Studies and major requirements since that time.

Students who have not completed the baccalaureate requirements within seven years of their initial enrollment at USU must have their General Education/University Studies and major requirements evaluated and approved by their department head and dean.

C. Course Expiration Policy

Coursework (including transfer credit) that is more than 10 years old and is required by the major may be disallowed by the student's department. Students will have an opportunity to revalidate coursework that is disallowed.

Departmental Requirements

A. Advanced Standing

Computer Science majors must have advanced standing or departmental authorization to register for upper-division (3000-level or above) Computer Science courses and 3000-level or above Electrical and Computer Engineering courses. To attain advanced standing, a student must demonstrate adequate proficiency in the core curriculum. This proficiency will be measured by:

- 1. achieving a minimum cumulative GPA of 2.0 and a minimum GPA of 2.5 (or grade of C- or better) among courses in one of the following core emphasis course sequences, or their equivalent, as determined by the Computer Science Department:

Science Emphasis: CS 1400, 1405, 1410, 2420, 2450, 2550, 3000; and MATH 1210, 1220, 3310.

Information Systems Emphasis: CS 1400, 1405, 1410, 2420, 2450, 2550, 3000; and MATH 1210, 1220, 3310.

Digital Systems Emphasis: CS 1400, 1405, 1410, 2420, 2450, 3000; ECE 2700; and MATH 1210, 1220, 3310.

Bioinformatics Emphasis: CS 1400, 1405, 1410, 2420, 2450, 2550, 3000; and MATH 1210, 1220, 3310.

Information Technology Emphasis: CS 1030, 1400, 1405, 1410, 2420, 2450, 2550, 3000; and MATH 1100.

If a course is repeated, the final grade achieved will be used in determining a student's advanced standing GPA.

- 2. having a USU cumulative GPA of at least 2.0.
- 3. passing the departmental undergraduate advanced standing exams. The undergraduate advanced standing exams are offered each semester, with a limit of one attempt for each exam within a month. A fee is charged for each test taken after the first attempt.

Students may apply for advanced standing by completing the advanced standing form (obtained from the department) and submitting it to the Computer Science Department. Students may apply for advanced standing during any semester. Advanced standing should be acquired before the first semester in which advanced standing classes are taken. If a student has completed all prerequisite CS courses for an upper-division CS course, and their schedule requires that the course be taken before all advanced standing courses are completed, they may petition the department for written permission (a waiver) to register for the course without advanced standing.

B. Required Grades

Any course listed as a required course for Computer Science majors, regardless of the department offering the course, must be completed with a grade of C- or better. Required courses must be taken for a letter grade, *except for* CS 3000 and 5070. In order to graduate, a student must have a 2.0 GPA in the upper-division computer science electives chosen for his or her emphasis.

Semester Schedules

In general, in order to graduate in four years, a student with no prior transfer credit will need to average 15 credits per semester. For semesters in which a student's major course load does not total at least 15 credits, electives and University Studies courses should be added to fill his or her schedule. It is also **strongly** recommended that each semester, prior to registering, students meet with their advisor to discuss their progress and plan their course schedule.

Effective Summer Semester 2006, some course numbers changed, due to House Bill 320 (Common Course Numbering). Course numbers used *prior to* Summer Semester 2006 are shown in parentheses, following *formerly*.

First Semester Schedule (15 credits)

Depending upon emphasis, a new student's first semester schedule is configured from the following:

	Credits
□ CS 1400 Introduction to Computer Science—CS 1	3
(formerly CS 1700)	
□ CS 1405 Introduction to Computer Science—CS 1 Lab	1
(formerly CS 1710)	
□ MATH 1210 (QL) Calculus I <i>(for SC, IS, DS, or BI Emphasis)</i> (4 cr) or	
□ MATH 1100 (QL) Calculus Techniques <i>(for IT Emphasis)</i> (3 cr) . . .	3 or 4
□ University Studies courses	7-8

Computer Science Major Core Requirements

All students in the Computer Science major, regardless of emphasis, must complete the following core requirements. All classes must be completed with a grade of C- or better.

A. Computer Science Core Requirements (27 or 29 credits) Credits

1. Required Courses (23-26 credits)

- CS 1400 Introduction to Computer Science—CS 1 (F,Sp,Su) 3
 (formerly CS 1700)
- CS 1405 Introduction to Computer Science—CS 1 Lab (F,Sp,Su) . . . 1
 (formerly CS 1710)

	Credits
<input type="checkbox"/> CS 1410 (QI) Introduction to Computer Science—CS 2 (F,Sp,Su) . . . 3 (formerly CS 1720)	3
<input type="checkbox"/> CS 2420 (QI) Algorithms and Data Structures—CS 3 (F,Sp,Su) 3 (formerly CS 2200)	3
<input type="checkbox"/> CS 2450 (CI) Software Engineering (F,Sp) 3 (formerly CS 2370)	3
<input type="checkbox"/> CS 3000 Undergraduate Seminar (F,Sp) 1	1
<input type="checkbox"/> CS 3100 Operating Systems and Concurrency (F,Sp) 3	3
<input type="checkbox"/> CS 2810 Computer Organization and Architecture (F,Sp) 3 (formerly CS 3550) (not required for DS emphasis)	3
<input type="checkbox"/> CS 4700 Programming Languages (F,Sp) 3	3
<input type="checkbox"/> CS 5050 Advanced Algorithms (F,Sp) 3	3
<input type="checkbox"/> CS 5070 Computer Science Capstone (F,Sp,Su) 1	1

2. Select one of the following two Organization courses (3 or 4 credits, depending upon emphasis):

- a. Computer Science Organization (3 credits)**
Required for SC, IS, BI, and IT Emphases:
- CS 2550 Computer Organization (F,Sp) 3
- b. Electrical and Computer Engineering Organization (4 credits)**
Required for DS Emphasis:
- ECE 2700 Digital Circuits (F,Sp) 4
(formerly ECE 2530)

B. Departmental and College of Science Science Sequence Requirements (8-10 credits)

Students must complete *one* of the following science sequences.

- 1. Physics (Required for DS Emphasis) Credits**
- PHYS 2210 (QI) General Physics—Science and Engineering I 4
 - PHYS 2220 (BPS/QI) General Physics—
Science and Engineering II 4
- 2. Physics (Available for IT Emphasis Only)**
- PHYS 2110 The Physics of Living Systems I 4
 - PHYS 2120 (BPS) The Physics of Living Systems II 4
- 3. Biology (Required for BI Emphasis)**
- BIOL 1610 Biology I (F) 4
(formerly BIOL 1210)
 - BIOL 1620 (BLS) Biology II (Sp) 4
(formerly BIOL 1220)
- 4. Chemistry**
- CHEM 1210 Principles of Chemistry I (F,Sp) 4
 - CHEM 1215 Chemical Principles Laboratory I (F,Sp) 1
(formerly CHEM 1230)
 - CHEM 1220 (BPS) Principles of Chemistry II (F,Sp,Su) 4
 - CHEM 1225 Chemical Principles Laboratory II (F,Sp) 1
(formerly CHEM 1240)
- 5. Geology**
- GEO 1110 (BPS) The Dynamic Earth: Physical Geology (F,Sp) 4
(formerly GEOL 1150)
 - GEO 3200 The Earth Through Time (Sp) 4

C. Additional Science Course(s) (4-5 credits)

Students in the SC, IS, DS, and BI Emphases must complete one or more additional science courses, so that the total number of science credits is a least 12. This course(s) must have a strong quantitative component and/or be required for science or engineering majors. *Advisor approval is required.*

D. Mathematics, Statistics, and Probability (11 credits required for SC, IS, DS, and BI Emphases; 3 credits required for IT Emphasis)

- | | Credits |
|---|---------|
| <input type="checkbox"/> MATH 1210 (QL) Calculus I (F,Sp,Su) 4 | 4 |
| <input type="checkbox"/> MATH 1220 (QL) Calculus II (F,Sp,Su) 4 | 4 |
| <input type="checkbox"/> MATH 3310 Discrete Mathematics (F,Sp,Su) 3 | 3 |
| <i>The SC, IS, DS, and BI Emphases require the 3 courses listed above.</i> | |
| OR | |
| <input type="checkbox"/> MATH 1100 (QL) Calculus Techniques (F,Sp,Su) 3 | 3 |
| <i>MATH 1100 is required for the IT Emphasis only.</i> | |

- | | Credits |
|--|---------|
| E. Ethics and Social Issues (3 credits) | |
| <input type="checkbox"/> PHIL 1120 (BHU) Social Ethics (F) (3 cr) or
(formerly PHIL 2500) | 3 |
| <input type="checkbox"/> PHIL 2400 (BHU) Ethics (Sp) (3 cr) or | 3 |
| <input type="checkbox"/> PHIL 3520 (DHA) Business Ethics (3 cr) or | 3 |
| <input type="checkbox"/> PHIL 4530 Ethics and Biotechnology (3 cr) or | 3 |
| <input type="checkbox"/> PHIL 4540 (DHA) Human Values and Information
Technology (3 cr) 3 | 3 |
| <input type="checkbox"/> BIOL 3100 (CI) Bioethics (Sp) 3 | 3 |

Note: BIOL 3100 is required for and available *only* to students enrolled in the BI Emphasis.

F. Oral Communications (3 credits)

- SPCH 1020 (CI) Public Speaking (F,Sp) 3
(formerly SPCH 1050)

G. Departmental Breadth or Depth Requirement (3 credits)

Students in the SC, IS, DS, and BI Emphases must select one advisor-approved Breadth or Depth course in the Social Sciences, Humanities, or Creative Arts.

Upper-Division Course Electives (All Emphases)

To meet computer science elective requirements, Computer Science majors must complete upper-division elective credits. The student's emphasis dictates the required number of elective credits. Unless otherwise stated, these electives **must** be chosen from the list below. In addition, the following restrictions apply.

1. Courses that otherwise meet a departmental or an emphasis requirement (e.g., CS 5050 for all emphases) cannot be used as part of the elective requirements.
2. Courses taken to meet these requirements that are not included in the list of electives below require prior written advisor approval.
3. The SC, IS, and DS Emphases require 19 elective credits. Furthermore, at least 13 of these credits must be Computer Science courses numbered 5000 or above. An additional 6 credits must be courses numbered 3000 or above.
4. The DS Emphasis requires ECE 3720 as one of the 3000-level elective courses.
5. The IS Emphasis requires CS 5800 and one course selected from among CS 5370, 5700, and 5850 as part of these elective courses. These will be counted among the CS 5000 or above elective courses.
6. The BI Emphasis requires CS 5800 and 4 elective credits selected from CS courses at the 5000-level or above.
7. The IT Emphasis requires 16 elective credits. These must include CS 5800 and 5850. The other credits must be selected from the following courses: CS 5000, 5100, 5200, 5300, 5370, 5400, 5450, 5460, 5500, 5600, 5700, 5890, and 5950.
8. Students may use *no more than 3 credits* of independent study (CS 4950, 5950, or 6950) toward their upper-division electives.

Eligible Elective Courses

- | | Credits |
|--|---------|
| <input type="checkbox"/> CS 4250 Cooperative Work Experience (F,Sp,Su) 3 | 3 |
| <input type="checkbox"/> CS 4720 Computer Networking I (F,Sp,Su) 3 | 3 |
| <input type="checkbox"/> CS 4730 Computer Networking II (Sp) 3 | 3 |
| <input type="checkbox"/> CS 4950 Undergraduate Research (F,Sp,Su) 3 | 3 |
| <input type="checkbox"/> CS 5000 Theory of Computability (Sp) 3 | 3 |
| <input type="checkbox"/> CS 5100 Graphical User Interfaces and Windows Programming (Sp) . . . 4 | 4 |
| <input type="checkbox"/> CS 5200 Distributed and Network Programming (F) 4 | 4 |
| <input type="checkbox"/> CS 5300 Compiler Construction (F) 4 | 4 |
| <input type="checkbox"/> CS 5370 Advanced Software Engineering (F) 3 | 3 |
| <input type="checkbox"/> CS 5400 Computer Graphics I (Sp) 4 | 4 |
| <input type="checkbox"/> CS 5450 Multimedia Systems (Sp) 4 | 4 |
| <input type="checkbox"/> CS 5460 Computer Security I (F) 3 | 3 |
| <input type="checkbox"/> CS 5600 AI: Problem Solving and Expert Systems (F) 3 | 3 |
| <input type="checkbox"/> CS 5650 CVPRIP I: Computer Vision, Pattern Recognition,
and Image Processing (F) 3 | 3 |
| <input type="checkbox"/> CS 5700 Object-Oriented Software Development (F) 3 | 3 |
| <input type="checkbox"/> CS 5800 Introduction to Database Systems (F) 3 | 3 |
| <input type="checkbox"/> CS 5850 Systems Analysis (Sp) 3 | 3 |
| <input type="checkbox"/> CS 5890 Topics in Computer Science (Topic) (F,Sp,Su) 3 | 3 |
| <input type="checkbox"/> CS 5950 Independent Study (F,Sp,Su) 3 | 3 |
| <input type="checkbox"/> ECE 3720 Microcomputer Systems Programming (Sp) 3 | 3 |

Science Emphasis Requirements (13 credits)

In addition to the requirements stated above, the Science Emphasis requires the following quantitative courses:

	Credits
<input type="checkbox"/> MATH 2210 (QI) Multivariable Calculus (F,Sp,Su)	3
<input type="checkbox"/> MATH 2250 (QI) Linear Algebra and Differential Equations (F,Sp,Su)	4
<input type="checkbox"/> MATH 5610 Computational Linear Algebra and Solution of Systems of Equations (F) (3 cr) or	
<input type="checkbox"/> Course chosen from departmental-approved list (list available from departmental advisor) (3 cr)	3
<input type="checkbox"/> STAT 3000 (QI) Statistics for Scientists (F,Sp,Su) (3 cr) or	
<input type="checkbox"/> MATH 5710 Introduction to Probability (F,Sp) (3 cr)	3

Information Systems Emphasis Requirements

In addition to the requirements stated above, the Information Systems Emphasis requires the following courses:

A. Quantitative Requirements (13 credits)	Credits
<input type="checkbox"/> ACCT 2010 Survey of Accounting I (F,Sp,Su)	3
<input type="checkbox"/> ACCT 2020 Survey of Accounting II (F,Sp,Su)	3
<input type="checkbox"/> BA 3080 (QI) Operations Research (F,Sp)	3
<input type="checkbox"/> STAT 2300 (QL) Business Statistics (F,Sp,Su)	4
B. Economics and Management (6 credits)	
<input type="checkbox"/> ECON 1500 (BAI) ⁵ Introduction to Economic Institutions, History, and Principles (F,Sp)	3
<input type="checkbox"/> MHR 3110 (DSS) ⁶ Managing Organizations and People (F,Sp,Su)	3

⁵ECON 1500 fulfills the University Studies Breadth American Institutions (BAI) requirement.

⁶MHR 3110 fulfills the University Studies Depth Social Sciences (DSS) requirement.

Digital Systems Emphasis Requirements (15 credits)

In addition to the requirements stated above, the Digital Systems Emphasis requires the following Electrical and Computer Engineering, Mathematics, and Statistics courses:

	Credits
<input type="checkbox"/> ECE 2250 Electrical Circuits (F,Sp) (formerly ECE 2410)	4
<input type="checkbox"/> ECE 3710 Microcomputer Hardware and Software (F,Sp)	4
<input type="checkbox"/> MATH 2250 (QI) Linear Algebra and Differential Equations (F,Sp,Su)	4
<input type="checkbox"/> STAT 3000 (QI) Statistics for Scientists (F,Sp,Su)	3

Bioinformatics Emphasis Requirements

In addition to the requirements stated above, the Bioinformatics Emphasis requires the following courses:

A. Foundation (3 credits)	Credits
<input type="checkbox"/> BIOL 3100 (CI) Bioethics (Sp)	3
B. Quantitative Requirement (6-7 credits)	
<input type="checkbox"/> STAT 3000 (QI) Statistics for Scientists (F,Sp,Su)	3
<input type="checkbox"/> MATH 2250 (QI) Linear Algebra and Differential Equations (F,Sp,Su) (4 cr) or	
<input type="checkbox"/> MATH 2270 (QI) Linear Algebra (F) (3 cr)	3 or 4

C. Advanced Coursework (9 credits)	
<input type="checkbox"/> CS 5660 Bioinformatics I (F)	3
<input type="checkbox"/> CS 5670 Bioinformatics II (Sp)	3
<input type="checkbox"/> STAT 5570 Statistical Bioinformatics (Sp)	3

D. Electives (12-13 credits)
Prior written advisor approval is required for electives. As part of their electives in this emphasis, students are strongly encouraged to include BIOL/CHEM 5730 (Genomic Technologies, 4 credits). With advisor approval, the prerequisites for this course (BIOL 3060; CHEM 1210 (or 1220), 2300 (or 2310), 3700) may be counted as part of the elective requirement.

Information Technology Emphasis Requirements

In addition to the requirements stated above, the Information Technology Emphasis requires the following courses:

A. Foundation (6 credits)	Credits
<input type="checkbox"/> CS 1030 (BPS) Foundations of Computer Science (F) (formerly CS 1010)	3
<input type="checkbox"/> CS 4720 Computer Networking I (F,Sp,Su)	3

B. Business Environment (21 credits)	
<input type="checkbox"/> ECON 1500 (BAI) Introduction to Economic Institutions, History, and Principles (F,Sp)	3
<input type="checkbox"/> ACCT 2010 Survey of Accounting I (F,Sp,Su)	3
<input type="checkbox"/> ACCT 2020 Survey of Accounting II (F,Sp,Su)	3
<input type="checkbox"/> BA 3400 (QI) Corporate Finance (F,Sp,Su)	3
<input type="checkbox"/> BA 3500 Fundamentals of Marketing (F,Sp,Su)	3
<input type="checkbox"/> MHR 3110 (DSS) Managing Organizations and People (F,Sp,Su)	3
<input type="checkbox"/> MHR 3710 Developing Team and Interpersonal Skills (F,Sp)	3

C. Quantitative Analysis (7 credits)	
<input type="checkbox"/> BA 3080 (QI) Operations Research (F,Sp)	3
<input type="checkbox"/> STAT 2300 (QL) Business Statistics (F,Sp,Su)	4

D. Electives (4-5 credits)
Prior written advisor approval is required.

Computer Science Minor (16-18 credits)

Computers find their way into virtually every facet of life. Similarly, many of the academic disciplines use computers in teaching and research, and therefore recommend to their majors that they minor in Computer Science. The following courses are required for the Computer Science Minor. All courses counted toward the minor must be completed with a grade of C- or better. The cumulative GPA in Computer Science Minor courses must be at least 2.5. There may be *no more than three* repeats of Computer Science courses (whether counted for the minor or not). Courses counted toward the minor must be selected from the Computer Science Department.

A. Required Courses (10 credits)	Credits
<input type="checkbox"/> CS 1400 Introduction to Computer Science—CS 1 (F,Sp,Su) (formerly CS 1700)	3
<input type="checkbox"/> CS 1405 Introduction to Computer Science—CS 1 Lab (F,Sp,Su) (formerly CS 1710)	1
<input type="checkbox"/> CS 1410 (QI) Introduction to Computer Science—CS 2 (F,Sp,Su) (formerly CS 1720)	3
<input type="checkbox"/> CS 2420 (QI) Algorithms and Data Structures—CS 3 (F,Sp,Su) (formerly CS 2200)	3

B. Computer Science Electives (6-8 credits)
Two Computer Science (CS) elective courses must be selected from the following: CS 2450, 2550, 2810, 3100, 4700, or any Computer Science class numbered 5000 or above. One of these two electives must be at the 3000 level or above.

Materials for Persons with Disabilities

This requirement sheet is available in large print, audio, and braille format upon request to the USU Disability Resource Center.

Requirement Changes and Details

Graduation requirements shown on this sheet are subject to change. Students should check with their assigned advisor concerning possible changes. A more detailed list of departmental requirements is available from the Computer Science Department.

For information contact

Computer Science Department; Main 414; Utah State University; 4205 Old Main Hill; Logan UT 84322-4205; tel. (435) 797-2451; e-mail usucs@cc.usu.edu; <http://www.cs.usu.edu>