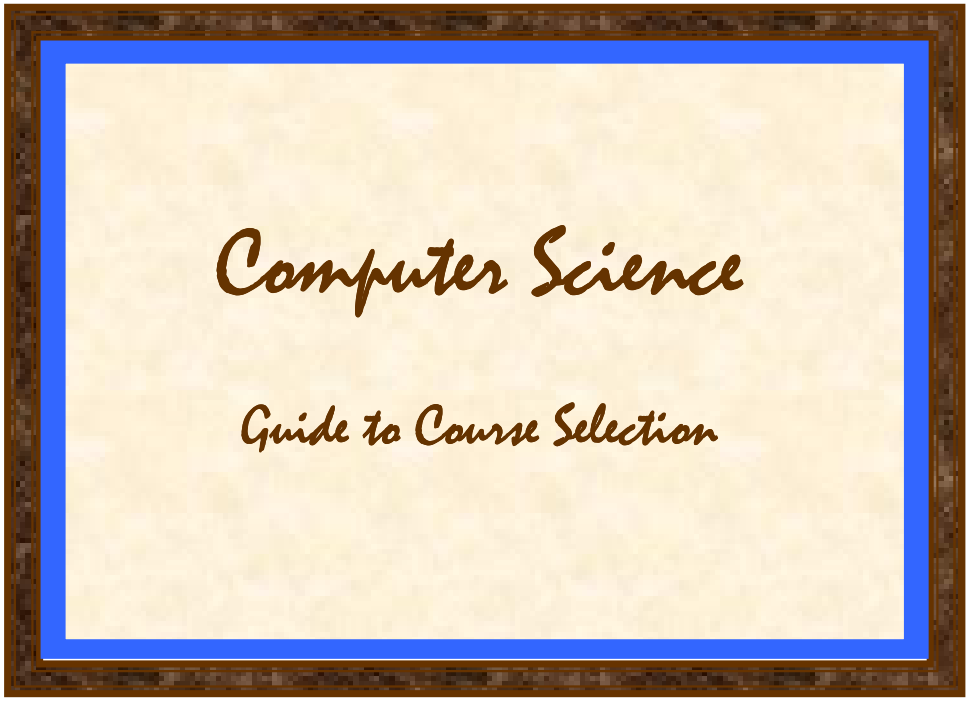

2007-2008 Edition

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Introduction

The School of Engineering

The Bachelor of Science (BS) curriculum is designed to give sound knowledge of basic principles in mathematics, science; to provide education in the theory, principles, and practices of computing; and to present the opportunity to obtain additional instruction and experience in a discipline outside of the School of Engineering. Students gain hands-on experience in the laboratory courses that accompany classroom work, and develop design skills in course work beginning in the first two years. Design experience continues in junior and senior years in the areas of software engineering, computer hardware and architecture, and in applications areas of the student's choosing, culminating in the one semester Senior Design Project course.

The Computer Science Degree

The Computer Science program produces graduates with a broad understanding of both computing principles and computing practice. The program emphasizes the fundamental computing models through the design and analysis of algorithms and software. Students are also given a foundational understanding of computer architecture. Included in the program is coursework in a computing application area outside of the School of Engineering, such as business or bioinformatics. Punctuating the senior year are two design laboratory courses. One design laboratory course is chosen from labs in microprocessors, software engineering, networks, or involving an industry-based research problem. The final design laboratory is a group project selected by students from a list of projects available for that semester.

Students interested in applying computer technology in non-engineering occupations will benefit from this degree program. It is ideally suited, for example, to students who wish to integrate computers with biology, chemistry, business and geography. Coursework builds a foundation in computer science, particularly software and theory, combined with more extensive coursework in a non-engineering subject area.

This degree program was first offered in the fall of 1999 and has been accredited by the Computing Accreditation Commission of ABET, 111 Market Place, Suite 1050, Baltimore, MD 21202-4012 - telephone☹410) 347-7700, since 2002.

Using this Guide

This Course Selection Guide will assist you in completing your educational goals at the University in the Computer Science Program, in conjunction with your faculty advisor and the University of Connecticut General Catalog. The Plan of Study current at the time of the student's entry into the junior year program or the time of the student's admission or readmission to the School, whichever is later, lists the requirements for that student’s graduation. Thus, this guide provides details on student degree requirements that may not be reflected in the University of Connecticut Catalog.

Accreditation of the Computer Science Program

The Computer Science program is accredited by the Computing Accreditation Commission of ABET, 111 Market Place, Suite 1050, Baltimore, MD 21202-4012 - telephone☹410) 347-7700. Accreditation is a peer review process which insures that educational programs meet established standards of quality and graduate students who are prepared for the requirements of their profession. As part of the accreditation process the Computer Science and Engineering department has developed the following Program Educational Objectives of the Computer Science program:

The Computer Science undergraduate program educational objectives are that our alumni/ae:

1. practice as computing professionals, conducting research and/or leading, designing, developing, or maintaining projects in various technical areas;
2. apply the ethical and social aspects of modern computing technology to the design, development, and usage of computing artifacts; and,
3. enhance their skills and embrace new computing technologies through self-directed professional development and post-graduate training or education.

In addition ABET's CAC requires that each student of the Computer Science program follow a curriculum that has the following minimum content:

- at least 40 semester hours of up-to-date study in computer science topics. At least 16 semester hours of broad-based core coverage of fundamental computer science material including basic coverage of algorithms, data structures, software design, concepts of programming languages, and computer organization and architecture. Theoretical foundations, problem analysis and solution design must be stressed within the program's core materials. Students must be exposed to a variety of programming languages and systems and must become proficient in at least one higher level language. All students must take at least 16 semester hours of advanced course work in computer science that provides breadth and builds on the core to provide depth.
- at least 30 semester hours of study in mathematics and science where at least 15 semester hours are mathematics including discrete mathematics, differential and integral calculus, and probability and statistics; and at least 12 semester hours of science including the equivalent of a two-semester sequence in a laboratory science for science or engineering majors. Additional science course work must be in science courses or courses that enhance the student's ability to apply the scientific method.
- at least 30 semester hours of study in humanities, social sciences, arts and other disciplines that serve to broaden the background of the student.
- The oral communications skills of the student must be developed and applied in the program.
- The written communications skills of the student must be developed and applied in the program.
- There must be sufficient coverage of social and ethical implications of computing to give students an understanding of a broad range of issues in this area.

The Computer Science program detailed in the Plan of Study meets these requirements.

Degree Requirements

University General Education Requirements

The University requires all baccalaureate degree students to satisfy a common core of course work known as the General Education Requirements. Course work in the Arts, Humanities and Social Sciences is also an integral part of the engineering program. Courses must be taken and distributed to cover the Four Content Areas and the Five
Competencies listed below. Please see the University of Connecticut General Catalog for more detailed information.
Note that students must earn at least a 2.0 grade point average for all calculable course work to receive a degree.

The Four Content Areas

The courses taken to satisfy the General Education Content Areas One, Two, and Three must be selected from six different departments.

1. **Arts and Humanities**
   Two courses from two different departments in this content area are required. These courses emphasize artistic, cultural, and historical topics. (PHIL 104, required of all engineering students, meets a Content Area One course requirement.)

2. **Social Sciences**
   Two courses from two different departments in this content area are required. These courses emphasize the ways in which people and institutions interact.

3. **Science and Technology**
   Two courses from two different departments in this content area are required. These courses provide background in the sciences, including laboratory work. (The science courses requirements for the Computer Science major meet this requirement.)

4. **Diversity and Multiculturalism**
   Two courses in this content area are required. These courses provide background on the global community and other cultures with which Computer Science graduates will interact over the course of their careers. At least one of these courses must be classified as international. One course (only) may be used to meet both this requirement and a course requirement in Content Areas One or Two.

The Five Competencies

1. **Second Language Competency**
   The minimum requirement is met by three years of a single foreign language in high school or equivalent, or completion of a two-semester course sequence in any foreign language at the University.

2. Writing (W) Competency

All students must take either ENGL 110 Seminar in Academic Writing or ENGL 111 Seminar in Writing through Literature. Students taking ENGL 250 in the Honors Program and transfer students with both ENGL 105 English Composition and ENGL 109 Literature and Composition have met the requirement. In addition to these courses, Computer Science students must complete the two required writing (W) courses; CSE CSE 293W and an additional course which may also be counted in one of the content areas of the General Education Requirements, as a Related Area course, toward a minor or as an elective course.

3. Quantitative (Q) Competency

All students must take two Quantitative (Q) courses. The mathematics course requirements for the Computer Science major meet this requirement.

4. Computer Technology Competency

By graduation, CSCI students are expected to understand computer logic and basic structure and to have the ability to develop algorithms. These competencies are achieved by completing CSE 123C — Introduction to Computing, or equivalent course.

5. Information Literacy Competency

In addition to the basic competency achieved in ENGL 110/111 or equivalent, all Engineering students will receive instructions in ENGR 100 or equivalent on how to conduct effective information searches, both in the library and on the web. As the student progresses, successive courses will require an increased level of Information Literacy competency. An advanced level of Information Literacy will be achieved at the completion of the program's major design experience course.

School of Engineering Requirements

All Computer Science students are required to complete the following School of Engineering Requirements:

Course	Title	Credits
CSE 123C	Introduction to Computing	2 credits
ENGR 100	Orientation to Engineering I	1 credit
MATH 115Q (or MATH 112Q and MATH 113Q) or MATH 120Q	Calculus I or Honors Calculus I	4 credits
MATH 116Q or MATH 121Q	Calculus II or Honors Calculus II	4 credits
PHIL 104	Ethics	3 credits

Computer Science Requirements

Computer Science majors are required to complete the following:

Course	Title	Credits
CSE 133	Object Oriented Design and Programming	3 credits
CSE 134	Data Structures and Introduction to Algorithms	3 credits
CSE 201 or CSE 220	Computer Architecture or Introduction to Computer Architecture	3 credits
CSE 230	Introduction to Software Engineering	3 credits
CSE 237	Theory of Computation	3 credits
CSE 254 or MATH 214	Introduction to Discrete Systems	3 credits
CSE 258	Operating Systems	3 credits
CSE 259	Algorithms and Complexity	3 credits
CSE 260 or CSE 278	Contemporary Issues in Computer Science and Engineering Ethics and Professionalism in Computer Science and Engineering	1 credit 3 credits.
CSE 293W	Computer Science and Engineering Design Project	3 credits
MATH 227Q	Applied Linear Algebra	3 credits

In addition a Senior Design Lab, a course in probability/statistics, an additional calculus course in either a multidimensional calculus or differential equations, a course in programming language theory, three Computer Science Requirement courses, three Related Area courses, any additional computer science coursework to bring the total computer science coursework to a minimum of 40 degrees without including CSE 254 sufficient additional elective course work to bring the total number of credits for the degree to a minimum of 120 credits.

It is recommended that students think about their choices as a whole, and consider using them deliberately to either gain breadth in their educational program or to focus on an area of particular interest. Students should consult their faculty advisor to plan a course of study which will best meet their individual educational goals.

Senior Design Lab Requirement

Every Computer Science and Engineering major must take one of the following courses.

Course	Title	Credits
CSE 262	Software Engineering Laboratory	3 credits
CSE 263	Networking and Distributed Systems Laboratory	3 credits
CSE 265	Independent Design Laboratory	3 credits
CSE 268	Microprocessor Laboratory	3 credits
CSE 269	Computer Science Design Laboratory	3 credits

Probability/Statistics Course

Every Computer Science major must take one of the following courses. This course work may also be applied towards a minor.

Course	Title	Credits
STAT 220Q	Statistical Methods (Calculus Level)	3 credits
STAT 230Q	Introduction to Mathematical Statistics	3 credits

Mathematics Requirement

Every Computer Science major must take one of the following courses. This course work may be also be applied towards a minor in Mathematics.

Course	Title	Credits
MATH 210Q or MATH 220Q	Multivariable Calculus or Honors Multivariable Calculus	4 credits
MATH 211Q MATH 221Q	Elementary Differential Equations or Honors Differential Equations	3 credits

Science Requirement

Every Computer Science major must take one full year sequence from the following courses and one additional science course from either the other discipline if chosen from the first table or from the second table.

Course	Title	Credits
CHEM 127Q-128Q	General Chemistry	8 credits
CHEM 129Q-130Q	Honors General Chemistry	8 credits
CHEM 137Q-138Q	Enhanced General Chemistry	8 credits
PHYS 131Q-132Q	General Physics with Calculus	8 credits
PHYS 141Q-142Q	Fundamentals of Physics	8 credits
PHYS 151Q-152Q	Physics for Engineers	8 credits

Course	Title	Credits
BIOL 107	Principles of Biology I	4 credits
BIOL 108	Principles of Biology II	4 credits
BIOL 110	Introduction to Botany	4 credits
GEOL 105	Earth and Life through Time with Laboratory	4 credits

Computer Science Programming Language Requirement

Every Computer Science major must take one of the following courses.

Course	Title	Credits
CSE 233	Programming Languages	3 credits
CSE 244	Programming Language Translation	3 credits

Computer Science Professional Requirement

Every Computer Science major must take three of the following courses.

Course	Title	Credits
CSE 228	Parallel Systems	3 credits
CSE 255	Principles of Data Bases	3 credits
CSE 257	Numerical Methods in Scientific Computation	3 credits
CSE 275	Computer Graphics	3 credits
CSE 277	Bioinformatics	3 credits
CSE 281	Data Security	3 credits
CSE 282	Artificial Intelligence	3 credits
CSE 298	Special topics in CSE (with permission)	3 credits

Minimum Computer Science Coursework Requirement

The minimum number of credits of Computer Science course work, not including CSE 254, and including only one credit of CSE 278 if taken, is 40 credits. Any additional CSE courses beyond CSE 101C, which can not be counted for credit in the CSE program, may be used to satisfy this requirement.

Related Area Course Requirement

A minimum of three 3-credit courses at the 200-level in a single related area forming a cohesive body of knowledge outside of Computer Science must be taken by all Computer Science majors. While it is not a requirement that all three courses be in the same academic department, they must be related in some way. Three courses from the same minor requirements work for this requirement. The coursework used to satisfy the related area course requirement may also be used in a minor.

Free Electives

Nine credits of any University courses, not on the credit restriction list, must be completed. If the General Education requirements are met by seven courses, an additional 3 credits of an elective course (12 credits total) are required. Elective course work may also be applied toward a minor.

Credit Restrictions

Many general University restrictions are shown in the University Catalog. Courses which may not be counted for credit toward graduation include:

- MATH 112Q and MATH 118Q along with any mathematics courses numbered below 110Q
- PHYS 101Q and PHYS 103Q
- CSE 101C
- STAT 100
- Any course outside of the School of Engineering which is labeled "independent study" or "variable topics" (e.g. courses numbered 298 and 299)
- Any courses taken on Pass/Fail basis (also may not be counted for any course requirement of the School of Engineering.)
- Any course prerequisite to a second in the same department, if the student has passed the second course.
- Only eight credits of chemistry (CHEM courses 124Q through 130Q) and only eight credits of physics (PHYS courses 121Q through 152Q) may be applied toward the degree.
- Only eight credits of chemistry (CHEM courses 124Q through 130Q) and only eight credits of physics (PHYS courses 121Q through 152Q) may be applied toward the degree.

Computer Science Curriculum

(Students entering Fall 2004 and later)

FRESHMAN YEAR

First Semester	Credits	Second Semester	Credits
Lab Science	4	Lab Science	4
MATH 115Q-Calculus I	4	MATH 116Q-Calculus II	4
CSE 123C-Intro to Computing	2	CSE 133 – Object Oriented Design	3
ENGR 100-Orientation to Engr.	1	ENGL 110 or 111-Seminar in Writing	4
Area 2 (Social Sciences)	3		15
	14		

SOPHOMORE YEAR

First Semester	Credits	Second Semester	Credits
Lab Science[2]	4	CSE 201 –Computer Architecture	3
Area 1 (Arts and Humanities)	3	CSE 259-Algorithms and Complexity	3
CSE 254 or Math 214-Intro to Discrete Systems	3	CSE 230-Introduction to Software Engineering	3
CSE 134-Data Structures and Algorithms	3	Area 2 (Social Science)	3
MATH 210Q-Multivariable Calculus or Math 211Q-Elem. Differential Equations	4 or 3	PHIL 104 (Area 1)- Ethics	3
	17or16		15

JUNIOR YEAR

First Semester	Credits	Second Semester	Credits
CSE 258-Operating Systems	3	CSE 237-Theory of Computation	3
CSE Professional Requirement	3	CSE Professional Requirement	3
STAT 220Q-Stat. Methods	3	CSE 260-Contemp. Issues in CSE	1 or
Related Area Course	3	or CSE 278- Ethics &	3
MATH 227Q-Linear Algebra	3	Professionalism in CSE	
	15	Related Area Course	3
		Free Elective	3
		Area 4 Course (Diversity and Multiculturalism)	3
			16/18

SENIOR YEAR

First Semester	Credits	Second Semester	Credits
CSE Design Laboratory	3	CSE 293W-CS & E Design Project	3
CSE 233-Programming Languages or CSE 244-Prog. Language Translation	3	Free Elective	3
CSE Professional Requirement	3	Free Elective	3
Related Area Course	3	Free Elective	3
Area 4 Course (Diversity and Multiculturalism) or Free Elective	3	Free Elective [1]	0 to 3
	15		12 to15

Plan of Study

Timing

Prior to registration in the first semester of the Junior year, or for transfer students in their second semester at the University of Connecticut, whichever is later, each student must complete a Plan of Study form documenting the program the student intends to follow to satisfy degree requirements for Computer Science and Engineering. If changes are subsequently made, a final revised Plan of Study form must be completed before the end of the fourth week of a student's last semester.

Preparation

Forms are available at the School of Engineering Undergraduate website (www.engr.uconn.edu/soe_ugrad.htm). To successfully prepare a plan of study, students must:

- carefully read both the *University of Connecticut Catalog* and the *Course Selection Guide*
- work with the faculty advisor to determine a Plan of Study that meets all degree requirements and student needs.

Exemptions and Substitutions

Students who desire to be excused from any of the requirements or to substitute other courses for those prescribed must do so by submitting a petition to the Assistant Dean for Undergraduate Affairs. For example, a student might request exemption from MATH 115Q who had calculus in high school and started in MATH 116Q, or substitution of PHYS 121Q, 122Q, 125Q for PHYS 151Q, 152Q. Exemption from course requirements or substitution of alternative courses must be clearly indicated on the Plan of Study form and explained in the "Comments" section or an attachment. Note: Exemptions mean that the requirement is satisfied but no credits are given in the process of satisfying the requirement.

[1] The number of credits is sufficient to earn a minimum of 120 credits.

Approval Process

After an initial consultation with the faculty advisor, the student should prepare two original copies of the Plan of Study form, in ink. The student's transcript should be reviewed to insure that completed courses are appropriately listed. After the student and advisor agree on the plan, each will sign the two original copies and submit them to the Coordinator of Undergraduate Studies in Computer Science and Engineering for review and approval. The student should check back with the advisor to see if any corrections must be made after review by the Coordinator. Upon completion of this stage of approval, the Plan of Study forms are forwarded to the Office of the Assistant Dean for Undergraduate Affairs in Engineering. If the Assistant Dean's approval is not given, the Plan will be returned to the department and then to the advisor for resolution. If approval is given, the Office of the Assistant Dean will return two approved tentative Plan of Study forms to the advisor. One original will be kept in the student's folder, and a photocopy will be returned to the student.

Changes

Each subsequent registration period, students must bring their approved Plan of Study to their advisor when they select courses for the next semester. An approved Plan of Study form can be modified and submitted at any time, in consultation with the student's advisor. Problems can be best avoided if changes are reviewed early. No modifications that jeopardize the meeting of requirements will be approved. A revised Plan of Study form may be created either by forming two new originals or by marking the changes on the formerly approved original, with each change initialed and dated by the advisor. If extensive changes are to be made, or if a second revision is necessary, a new Plan of Study form should be submitted following the same process. In the student's last semester, the student must file a "final" Plan of Study form. This form must accurately list all of the courses that were taken to satisfy degree requirements. If the original form is accurate, then a new "final" form is not required.

Filling out the Plan of Study Form

The Plan of Study form should be filled out neatly and in ink. All approval signatures and initials should be in ink and dated. Some guidelines follow to assist you in completing the form.

Expected date of graduation and catalog year

It is important that the intended date of graduation (month and year) be accurately listed, and that the form correctly reflect the catalog year in which the student is filing. The Registrar needs both items to certify the completed degree requirements by the student's graduation date. If the student is using a catalog year other than the one in which they were most recently admitted to the School of Engineering, a form to change the catalog year must also be completed. The change of catalog year form can be found at (http://www.registrar.uconn.edu/change.doc).

Courses taken

The Plan of Study form must show exactly the courses used to satisfy degree requirements.

General Education Requirements

For the second language competency line, the words "High School" should be circled if the student has met this requirement in high school. If not, the appropriate courses should be listed with the credits earned.

Required courses

Required courses are printed on the form. If there are alternatives listed, the course that the student intends to take should be circled (e.g., where it says MMAT 201 or 243, one course should be circled).

Transfer Courses

Transfer courses should be listed on the Plan of Study form, and indicated with a superscript "T". Courses which are the result of Advanced Placement work done in High School, whether through AP Tests results or formal arrangement with UConn (UConn Early College Experience Program formerly UConn High School Coop Program) do not need to be marked with a T and are counted as UConn coursework. Columns for sub-totaling "UConn Credits" and "Transfer Credits" are listed to the right of the form. Students with transfer credits should separate all credits earned at the University of Connecticut from those completed elsewhere, fill in the columns, and sum them across each row.

Credit Summary

The Transfer Credit line in the bottom section of the form should be the sum of all transfer credits that are applied toward graduation. The UConn Credits line should show the total of all credits taken at the University of Connecticut that are applied toward graduation. Do not include credits for classes which cannot be counted toward graduation credit in either total. See Credit Restrictions above. The sum of the two totals should be listed on the Total Credits line. The total credits must equal or exceed 126.

Professional Requirements

Write in the 200-level courses you will use to fulfill the Computer Science and Engineering and Professional Requirements.

Double Major

Students may pursue a double major in Computer Science Engineering and another major in a different department in the School of Engineering undergraduate curriculum. A separate Plan of Study form must be prepared and submitted for approval to each department. The double major must be indicated at the bottom of the Plan of Study form; i.e. "Double major: Department."

Additional Degree

Students may earn two separate bachelor degrees from two different schools or colleges of the University. Students must meet the requirements of both of the schools or colleges, and a Plan of Study form must be submitted to each department for each degree. An example of this would be the Eurotech program (with the College of Liberal Arts and Sciences): a student pursuing this program would submit a form for both the Computer Science & Engineering and the Modern & Classical Languages departments.

The student must complete an Additional Degree Petition, which requires the consent signature of the dean of each school or college in which the student will be enrolled. Students may get Additional Degree Petitions from the offices of deans or from the Registrar. A student pursuing two or more degrees concurrently must designate one degree the primary degree.

The student must meet all requirements for each degree. The two degrees require at least 30 degree credits more than the degree with the higher minimum-credit requirement. For example, Computer Science degrees require at least 120 credits and Arts and Sciences degrees require at least 120 credits. The Computer Science and Engineering degree has the higher minimum-credit requirement, so the total is 120 + 30, or 150. (If the student pursues a third degree, the two additional degrees require at least 60 degree credits more than the degree with the highest minimum-credit requirement.) **At least 30 of the additional credits must be 200-level courses, or above, in the additional degree major or closely related fields and must be completed with a grade point average of at least 2.0.**