

**B.S.C.S. – Bachelor’s of Science in Computer Science
College of Engineering**

Department of Electrical & Computer Engineering and Computer Science

Effective Date: September, 2002

Course Requirements:

Courses from the Department of ECECS

<u>Course Name</u>	<u>Course Number</u>	<u>Credit Hours</u>
Orientation to Computer Science	20-ECES-120	3
Computer Science 1 + lab	20-ECES-121	4
Computer Science 2	20-ECES-122	3
Data Structures	20-ECES-228	3
Software Development + lab	20-ECES-229	4
Digital Systems Design	20-ECES-235	3
Digital Systems Design Lab for CS	20-ECES-238	2
Assembler Programming I	20-ECES-317	3
Programming Languages & Methodologies	20-ECES-323	3
Computer Organization	20-ECES-326	3
Pre-Junior Seminar in CS	20-ECES-362	2
Organization of Programming Languages	20-ECES-403	3
Operating Systems	20-ECES-429	3
Network Systems Programming	20-ECES-454	3
Design and Analysis of Algorithms 1, 2	20-ECES-471, 472	6
Senior Design Project	20-ECES-561, 562, 563	9
Theory of Automata & Formal Languages	20-ECES-670	3
CS Electives		<u>15</u>
Total required hours		75

Courses From Other Departments:

English I, II, III	15-ENGL-101, 102, 103	9
General Physics I, II, III	15-PHYS-201, 202, 203	6
General Physics Labs I, II, III	15-PHYS-211, 212, 213	3
Calculus 1, 2, 3	15-MATH-251, 252, 253	13
Calculus Labs	15-MATH-256, 257	2
Matrix Methods	15-MATH-276	3
Symbolic Logic I	15-PHIL-341	6
Philosophy	15-PHIL-243 or 345	6
Probability and Statistics 1, 2	15-MATH-361, 362	6
Discrete Mathematics & Appl.	15-MATH-410	3
Technical Writing	15-ENGL-492	3
Professional Development	36-PD-120, 20-PD-502	2
BOK (Breadth of Knowledge)		39
Natural Science		9
Free electives		<u>16</u>
Total required hours		126

Computer Science Electives:

This list of electives is available to junior and senior majors in ECECS with the appropriate prerequisites. Students must receive prior approval through a college petition for exceptions to this list. Students must take at least 5 of the following courses; at least 3 must be courses marked with *.

<u>Course Name</u>	<u>Course Number</u>
Software Engineering	20-ECES-493 & 495*
Database Design	20-ECES-592
Advanced Database Design	20-ECES-593
Special Topics in Computer Science	20-ECES-595
Wireless Mobil Networking	20-ECES-597
Computer Arithmetic	20-ECES-615*
Silicon Programming	20-ECES-617*
UNIX Operating System	20-ECES-620 (summer only)
Mathematical Logic I, II, III	20-ECES-621*, 624, 635
Data Encoding	20-ECES-625*
Artificial Intelligence Prog. & Logic 1, 2	20-ECES-633*, 4*
Intelligent Systems	20-ECES-636
Machine Learning	20-ECES-637*
Digital Image Processing	20-ECES-642
Database Theory	20-ECES-651 *
Computer Graphics	20-ECES-660*
User Interface I	20-ECES-667*
Collaborative Computing	20-ECES-669*
Parallel & Distributed Systems	20-ECES-675*
Multidis. & Collab. Dsgn for Sys. on a Chip	20-ECES-650
Special Topics in Computer Science	20-ECES-690
Compiler Theory & Lab	20-ECES-683, 685 (count as 1 elective)*
Advanced Programming Concepts	20-ECES-694*
Probability and Statistics III	15-MATH-363
Numerical Analysis I, II, III	15-MATH-514, 5, 6
Linear Programming I II	15-MATH-524, 5
Non-Linear Optimization	15-MATH-526
Appl. Prob. & Stochastic Proc. I, II	15-MATH-577, 8
Combinatorics	15-math-585
Graph Theory	15-MATH-588

SCIENCE ELECTIVE SEQUENCES FOR THE CS MAJOR

1. Biology 101, 102, plus labs 111, 112
2. Chemistry 101, 102, 103 (9 credit hours)
3. Chemistry 101, 102 plus labs 111, 112
4. Geology 101, 102 plus labs 111, 112,
5. Physics 351, 352 (This might require additional mathematics, which would count as free elective credit for the student.)
6. Any 3 or more credits from (one of) numbers 1-5 above plus Sociology 321, 322 (Research methods in Sociology)

NOTE: Before taking Sociology 321, the student must have completed: MATH 361, 362 (required for CS major) and Sociology 141-142 (which count for Social Science credit).

7. Any 3 or more credits from (one of) numbers 1-5 above plus Anthropology (linguistics) 231 and 232. (Before taking Anthropology 231, the student must have completed Anthropology (Linguistics) 230.

NOTE: Anthropology 231, 232 may alternatively count as a social science elective, but no course may count as both a science elective and a social science elective for the same student. In order to avoid any confusion, if a student wishes to use this sequence to count as a science sequence, when the student applies for graduation (s)he should include a note stating that (s)he wants the course to count as a science sequence.

Some of the above sequences are more than 9 credit hours. The additional credit hours, if any, count as free elective credits.

Check with your CS Advisor on all Free Electives and Science Electives for approval prior to registration.

- **Free electives** – May be from any program EXCEPT lower level courses that serve as the prerequisites for required courses listed above, remedial courses, duplicate courses from different colleges/programs, and extracurricular activity courses.
- **CS Electives** - Must be chosen from the approved list of courses listed on page 2 under ‘Computer Science Electives’.
- **Linear Algebra 1 & 2** (15 MATH 351 & 15 MATH 352) may be substituted for Matrix Methods. Both 1 & 2 must be taken.
- **General Physics** (15 PHYS 204, 205, 206) and their labs may be substituted for Physics 201, 202 and 203 and their labs.
- **Science Electives** –Consult your Computer Science academic advisor for assistance.

Humanities & Social Sciences (Classes 2003 – 2005)

Breadth of Knowledge (BOK) replaces H/S on curriculum sheets beginning with the class 2006. See the College Web page under General Education Requirements.

Computer Science majors are required to complete Freshman English I-III, Technical Writing, Intro to Formal Logic, and the listed Philosophy course plus at least 39 *additional* credit hours of elective courses in Humanities and Social Sciences. **At least 12 of these 39 credit hours must be in designated upper level courses.** The possible H/S electives are the same as the general College of Engineering requirements (see <http://www.eng.uc.edu/currentstudents/curriculuminfo/humansocsci/>) with one exception. Introduction to Logic (15-065-123) does not count (and of course, the courses explicitly listed as CS major requirements are not counted as electives for CS majors). The document listing COE H/S requirements separates courses into two groups of respective Humanities and Social Sciences courses. Each course group is further divided by number brackets* and as upper level (UL) courses. Computer Science majors must distribute their H/S electives as follows:

Social Science

- At least 15 credit hours of the 39 required hours must be from the numbered brackets in Social Sciences.
- At least 9 credit hours should be from a single numbered bracket, and **at least 3 credit hours of the 9 must be designated as an upper level course.**

Humanities

- At least 15 credit hours of the 39 required hours must be from the numbered brackets in Humanities.
- At least 9 credit hours should be from a single numbered bracket, **and at least 3 credit hours of the 9 must be designated as an upper level course.**
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***Numbered brackets refer to either the letter H (Humanities) or S (Social Sciences) plus a number that references a course within a particular program area. Use the index in the front of the packet to locate approved H/S courses within the packet.**