

**College of Engineering
Department of Computer Science
Bachelor of Science Degree in Computer Science
For students graduating in calendar year 2012**

DRAFT

Fall	Spring
Freshman Year	
Chem 1035 General Chemistry ³ (3)___	CS 1114 Intro to Software Design <u>or</u> (3)___
Chem 1045 General Chem Lab ³ (1)___	CS 1124 Intro to Media Computation (3)___
EngE 1024 Engineering Exploration ⁸ (2)___	EngE 1104 Exploration of the Digital Future ⁸ (2)___
Math 1114 Elementary Linear Algebra (2)___	Math 1224 Vector Geometry (2)___
Math 1205 Calculus I (3)___	Math 1206 Calculus II (3)___
Engl 1105 Freshman English ^{1, 4, 8} (3)___	Phys 2305 Foundations of Physics I ³ (4)___
CLE Elective ^{1, 4} (3)___	Engl 1106 Freshman English ^{1, 4, 8} (3)___
Total 17	Total 17
Sophomore Year	
CS 2104 Intro to Problem Solving in CS (3)___	CS 2114 Software Design & Data Structures (3)___
Math 2224 Multivariable Calculus (3)___	CS 2505 Intro to Computer Organization I (3)___
Math 2534 Discrete Math and Logic ² (3)___	Math 2214 Intro to Differential Equations (3)___
Natural Science Elective ³ (3)___	Comm 2004 ^{4, 8} Public Speaking (3)___
Natural Science Lab ³ (1)___	CLE Elective ^{1, 4} (3)___
CLE Elective ^{1, 4} (3)___	
Total 16	Total 15
Junior Year	
CS 3114 Data Structures and Algorithms (3)___	CS 3304 Comparative Languages (3)___
CS 2506 Intro to Computer Organization II (3)___	CS 3214 Computer Systems (3)___
CS 3604 Professionalism in Computing ⁸ (3)___	CS 3/4XXX Elective ⁶ (3)___
CLE Elective ^{1, 4} (3)___	Stat 4705 Statistics for Engineers <u>or</u> (3)___
Math 3134 Combinatorics ² (3)___	Stat 4714 Probability & Statistics for EE (3)___
	Free Elective (3)___
Total 15	Total 15
Senior Year	
CS 41X4 Theory Course ⁵ (3)___	CS 4944 Senior Seminar ⁸ (1)___
CS 3/4XXX Elective ⁶ (3)___	CS 4XXX Capstone ^{8, 9} (3)___
CS Technical Elective ⁷ (3)___	CS 4XXX Elective ⁶ (3)___
Engl 3764 Technical Writing ^{4, 8} (3)___	CLE Elective ^{1, 4} (3)___
CLE Elective ^{1, 4} (3)___	Free Elective (3)___
Total 15	Total 13

Footnotes:

1. **Curriculum for Liberal Education Requirements (CLE).** (Consult *Guide for Curriculum for Liberal Education* at <http://www.uaac.vt.edu/coreguides/index.html> for list of allowable courses for Areas 2, 3, 6 & 7.)

Area 1: Writing and Discourse. 6 credits of freshman English.

_____ Engl 1105 _____ (3 cr) _____ Engl 1106 _____ (3 cr)

Area 2: Ideas, Cultural Traditions, and Values, 6 credits

_____ (3 cr) _____ (3 cr)

Area 3: Society and Human Behavior, 6 credits

_____ (3 cr) _____ (3 cr)

Area 4: Scientific Reasoning and Discovery is met by courses required for the major.

Area 5: Quantitative and Symbolic Reasoning is met by courses required for the major.

Area 6: Creativity and Aesthetic Experience, 1 credit. While CS majors can meet Area 6 with a one-credit course, taking a three-credit course for this area may help meet the 30-hour non-technical elective requirement discussed in footnote 4.

_____ (1 or 3 cr)

Area 7: Critical Issues in a Global Context, 3 credits

_____ (3 cr)

2. **CS/Math double majors** take the pair of courses Math 3034, Math 3124 in place of Math 2534, Math 3134.
3. **Natural Science Elective/Lab**. Computer Science majors must have a minimum of 12 hours of natural science. Of those 12 hours, 8 hours must be in a sequence. This requirement can be satisfied by taking the required Chem 1035/45 and Phys 2305, and then one of (Chem 1036/46) or Phys 2306. (Chem 1036/46 may not be offered every fall semester.)

Students can also satisfy the sequence requirement by completing an eight hour sequence in Biology in addition to Chem 1035/45 and Phys 2305: to do so, students must complete one of the following sequences: (Bio 1005-6 & 1015-6), or (Bio 1105-6 & 1115-6), or (Bio 1105-6 & 1125-6).

4. **Computer Science Non-technical Course Requirement**. CS majors must complete 30 credits of non-technical courses.

All courses are approved as non-technical courses except those in the departments of Biological Sciences, Chemistry, Geosciences, Physics, Mathematics, and Statistics, and all departments in the College of Engineering, except for engineering courses appearing in CLE Area 7. Also excluded are courses listed as technical electives in footnote 7; a course cannot be both a technical and non-technical course.

5. **Computer Science Theory Course**. All CS majors must take one of the CS senior-level theory courses: 4104, 4114, 4124.
6. **Computer Science 3000/4000 Elective**. Students can select any 3-credit CS 3000 or 4000-level course, excluding 4004 and 4014 but including CS Independent Study (4974) and CS Undergraduate Research (4994), not used to satisfy another requirement.
7. **Computer Science Technical Elective**.
 - a. Any 3-credit CS 3/4/5000-level course (except 4004 and 4014) not otherwise used to fulfill a Computer Science requirement can be used as a technical elective, including both Independent Study (CS 4974) and Undergraduate Research (CS 4994).
 - b. An approved 4000-level course in another discipline that has significant technical content relevant to the science or application of computer technology can be used as a technical elective.
 - i. Requests to have a non-CS course approved as a technical elective are made by submitting, prior to taking the course, the request for substitution form available in the CS Advising Center. This includes non-CS Independent Study (4974) and Undergraduate Research (4994) courses.
 - ii. Below is a listing of non-CS courses that are approved as technical electives. **Note:** Many of these courses are restricted to majors other than CS in certain semesters, and virtually all have prerequisites that must be met to be eligible to take the course.

ACIS 4514, 4515, 4524	COMM 4374	GEOG/GEOS 4084
ACIS/BIT 4554, 4564	ECE 3504, 3534, 4510, 4524, 4550, 4560, 4564	GEOG 4314, 4324
BIT 4434, 4444, 4494, 4514, 4614	ECE 4984 (depending on topic)	MATH 4175, 4454

8. **Visual Expression, Written and Spoken (ViEWS) Requirement**. (ViEWS requirements are applicable to all students entering Fall 2005 and thereafter.) Courses used to satisfy the CS ViEWS requirement: Engl 1105, Engl 1106, EngE 1024, EngE 1104, Engl 3764, Comm 2004, CS 3604, CS 4944 and the CS capstone course.
9. **Capstone Requirement**. CS Majors must complete one senior capstone course. Students can choose from CS 4284, CS 4624, CS 4644, and CS 4704, and other 4/5000-level CS courses that have received prior approval as fulfilling the capstone requirement.

Additional Requirements and Notes:

- A. **Grade of "C" or Better Required in Specific CS Courses:** To qualify for a B.S. degree in Computer Science, a student must earn a "C" (2.0) or better in (CS 1114 or CS 1124), CS 2104, CS 2114, CS 2505, CS 2506 and CS 3114.
- B. **Prerequisites:** There are no hidden prerequisites for required courses on this checksheet. Students should always refer to the latest version of the Undergraduate Course Catalog for the most up-to-date listing of prerequisites. To ensure timely completion of requirements, please see a Computer Science academic advisor before scheduling classes each semester.

- C. **Progress Towards Degree (Policy 91)**: A Computer Science major must do the following in order to maintain satisfactory progress towards the degree:
1. be registered in at least one 3-credit course required in the major during each on-campus semester of the regular academic year;
 2. maintain a GPA of 2.0 or better in the major;
 3. maintain an overall GPA of 2.3 or better;
 4. not take any CS course required in the major more than twice, including attempts ending in course withdrawal; and
 5. not repeat more than 3 CS courses required in the major, including attempts ending in course withdrawal.
- D. **Total Hours and Minimum GPA Requirements**: Each student must complete at least 123 semester credit hours with a minimum overall GPA of 2.00 and a minimum in-major GPA of 2.00. The in-major GPA is calculated using all classes with a CS designator except CS 1004, 4004, and 4014.
- E. **Applicable Checksheet and Curriculum for Liberal Education Requirements**: Graduation requirements are determined by the checksheet in effect at the time of graduation (except for University CLE requirements as discussed below). Each checksheet is applicable for an entire calendar year, i.e., the May, Summer, and December completion dates of that year.
- Curriculum for Liberal Education requirements are based upon the date of entry to Virginia Tech, which is assumed to be Fall Semester, four years prior to the date of graduation. Students whose date of entry into Virginia Tech differs from that assumed by the checksheet must determine which University CLE Requirements apply to them. Students with questions about this matter should refer to the University CLE guides at <http://www.uaac.vt.edu/coreguides/index.html> and consult with their advisor.
- F. **Foreign Language Requirement**: Any student who did not complete two years of one foreign language in high school must earn six credits in one language in college-level courses. These credits do not count toward minimum graduation requirements.
- G. **CS Independent Study/Undergraduate Research Credits: Maximum credits, minimum GPA**. No more than a total of 6 credits of CS Independent Study (4974) and/or CS Undergraduate Research (4994) may be used to fulfill Computer Science degree requirements. To take Independent Study (2974 or 4974), a minimum overall and in-major GPA of 2.5 is required. To take Undergraduate Research, a minimum overall GPA of 2.5 and an in-major GPA of 3.0 is required. Additionally, at least 6 credits of required CS 3000-level courses must have been completed before CS 4974 or CS 4994 may be taken.