FALL SEMESTER FRESHMAN 2015	Credits
CHEM 1035 General Chemistry *Pre: None*	3
CHEM 1045 General Chemistry Lab *Co: CHEM 1035*	1
ENGL 1105 First-Year Writing *Pre: None*	3
MATH 1225 Calculus of a Single Variable **(C-)** *Pre: Math Ready*	4
ENGE 1215 Foundations of Engineering **(C-)** *Co: MATH 1225*	2
CLE (Area 2, 3, or 7)	3
TOTAL	16

SPRING SEMESTER FRESHMAN 2016	Credits
ENGL 1106 First-Year Writing *Pre: ENGL 1105*	3
MATH 1226 Calculus of a Single Variable *Pre: MATH 1225 (C-)*	4
PHYS 2305 Found of Physics I w/lab *Pre: MATH 1225; Co: MATH 1226*	4
ENGE 1216 Foundations of Engineering **(C-)** *Pre: ENGE 1215 (C-)*	2
CS 1114 Intro to Software Design **(C)**	3[F, S, SI, SII]
TOTAL	16

FALL SEMESTER SOPHOMORE 2016	Credits
MATH 2204 Multivariable Calculus *Pre: MATH 1226*	3
MATH 2534 Introduction to Discrete Math *Pre: CS 1114 (C) (Note: Math double majors take MATH 3034)*	3[F, S, SI]
Natural Science Elective	4
CS 1944 First Year Seminar	1[F, S]
CS 2104 Intro to Problem Solving in CS **(C)** *Pre: MATH 1225*	3[F, S, SI]
CS 2114 Software Design & Data Structures **(C)** *Pre: CS 1114 (C)*	3[F, S, SI, SII]
TOTAL	17

SPRING SEMESTER SOPHOMORE 2017	Credits
COMM 2004 Public Speaking	3
MATH 2114 Introduction to Linear Algebra *Pre: MATH 1225 (B) or MATH 1226*	3
CS 2505 Intro to Computer Organization I **(C)** *Pre: CS 2114 (C); Co: MATH 2534*	3[F, S, SI]
CLE (Areas 2, 3, or 7)	3
CLE (Areas 2, 3, or 7)	3
TOTAL	15

FALL SEMESTER JUNIOR 2017	Credits
MATH 3134 Combinatorics *Pre: MATH 2534 (Note: Math double majors take MATH 3124)*	3
CS 2506 Intro to Computer Organization II **(C)** *Pre: 2505 (C), 2114 (C), MATH 2534*	3[F, S]
CS 3114 Data Structures and Algorithms **(C)** *Pre: 2505 (C), 2114 (C), MATH 2534*	3[F, S, SI]
CLE (Areas 2, 3, or 7)	3
ENGL 3764 Technical Writing	3
TOTAL	15

SPRING SEMESTER JUNIOR 2018	Credits
STAT 4705 Statistics for Engineers *Pre: MATH 222* **–OR–** STAT 4714 Probability & Statistics for EE *Pre: MATH 2224*	3
CS 3214 Computer Systems *Pre: 2506 (C), 2114 (C)*	3[F, S]
CS 3/4XXX Elective	3
CS 3604 Professionalism in Computing *Pre: 3114 (C), COMM 2004*	3[F, S]
CLE (Areas 2, 3, or 7)	3
	15

FALL SEMESTER SENIOR 2018	Credits
CS 3304 Comparative Languages *Pre: 3114 (C)*	3[F, S]
CS 41X4 Theory Course *Pre: 3114 (C), (MATH 3034 or MATH 3134)*	3
CS 3/4XXX Elective	3
CS Technical Elective	3
Free elective	3
TOTAL	15

SPRING SEMESTER SENIOR 2019	Credits
CS 4944 Senior Seminar	1[F, S]
CS 4XXX Capstone	3
CS 4XXX Elective	3
CLE (Area 6)	3
Free Elective	4
TOTAL	14

Curriculum for Liberal Education (CLE)

Consult the CLE Alphabetical Listing at: http://www.cle.prov.vt.edu/guides/alpha.html, CLE courses need to be completed prior to graduation

CLE Area	Course	Cr	Course	Cr
CLE Area 1: Writing and Discourse (6 hrs)	ENGL 1105	(3)	ENGL 1106	(3)
CLE Area 2: Ideas, Cultural Traditions, Values Electives (6 hrs)		(3)		(3)
CLE Area 3: Society & Human Behavior electives (6 hrs)		(3)		(3)
CLE Area 4: Scientific Reasoning and Discovery (8 hrs)	Met by natural science requirements (note 2 below)	(4)	Met by natural science requirements (note 2 below)	(4)
CLE Area 5: Quantitative and Symbolic Reasoning (8 hrs)	MATH 1225	(4)	MATH 1226	(4)
CLE Area 6: Creativity & Aesthetic Experience elective (1 or 3 hr)				**(1 or 3)**
CLE Area 7: Global Issues Elective (3 hrs)				**(3)**

If a CLE course is double-counted to satisfy two different CLE areas, a free elective(s) must be taken to maintain a minimum of 123 credits.

The CS degree requires:

1. **CS Non-Technical Courses Requirement**. CS majors must complete 30 credits of non-technical courses. All courses are approved as non-technical 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 satisfying CLE Area 7. Also excluded are courses listed as CS technical electives.
2. **Natural Science Elective** (CLE Area 4). A minimum of 12 hours of natural science is required. Of those hours, 8 hours must be in a sequence. In addition to the required CHEM 1035/45 and PHYS 2305, this requirement may be satisfied by taking (a) CHEM 1036/46, (b) PHYS 2306, or (c) an eight hour sequence in Biology: BIOL 1005-6 & (1015-6, or 1115-6, or 1125-6).
3. **Independent Study/Undergraduate Research.** No more than a total of 6 credits of CS Independent Study (4974) and/or CS Undergraduate Research (4994) may be used to fulfill CS 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 (4994), a minimum overall GPA of 2.5 and an in-major GPA of 3.0 is required. CS 4974 and 4994 also require completion of CS 3114 with a grade of C or better.
4. **CS Technical Elective.** Any 3-credit CS 3/4/5000-level course not otherwise used to fulfill a CS requirement can be used as a technical elective. Alternately, any 3/4/500-level non-CS course from an approved list can be used to meet this requirement.
5. **Capstone Requirement.** Students must complete one 4000-level capstone course. Students may choose from CS 4284, CS 4624, CS 4634, CS 4644, CS 4704, CS 4784, CS 4884 and other 4/5000-level CS courses that have received prior approval as fulfilling the capstone requirement.

Change of Major Requirements: Please see http://www.enge.vt.edu/undergraduate-changing-majors.html

Foreign Language Requirements: Students must have had 2 years of a foreign language in high school or one year at the college level (6 credit hours) of the same language. College-level credits used to meet this requirement do not count towards the degree.

Satisfactory Progress Towards Degree: University Policy 91 outlines university-wide minimum criteria to determine if students are making satisfactory progress towards the completion of their degrees. The CS Department fully supports this policy. Specific expectations for satisfactory progress for Computer Science majors are as follows:

- Each student must meet the minimum University-wide criteria as described in Policy 91 and summarized in the Undergraduate Catalog (http://www.undergradcatalog.registrar.vt.edu/1617/academic-policies.html#22).
- Be registered in at least one 3-credit course required in the major during each on-campus semester of the regular academic year.
- Maintain an in-major GPA of 2.0 or better. (The in-major GPA is calculated using all classes with a CS designator except 1004, 4004 and 4014.)
- Not take any CS course required in the major more than twice, including attempts ending in course withdrawal.
- Not repeat more than 3 CS courses required in the major, including attempts ending in course withdrawal.

Statement of Hidden Prerequisites: Pre-requisites for each course are listed after the course title. Prerequisites may change from what is indicated. Be sure to consult the University Catalog or check with your advisor for the most current requirements. There are no hidden pre-requisites in this program of study.

Graduation Requirements: To qualify for a B.S. degree in CS, a student must:

- Earn a "C" (2.0) or better in CS 1114, CS 2104, CS 2114, CS 2505, CS 2506 and CS 3114, and
- Complete at least 123 semester credit hours with a minimum overall GPA of 2.00 and a minimum in-major GPA of 2.00.

Computer Science Technical Electives

Computer Science majors must satisfy a 3 credit hour technical elective requirement. This requirement can be met in either of the following two ways:

1. Any 3-credit CS 3/4/5000-level course not otherwise used to fulfill a Computer Science requirement can be used as a technical elective (except 3634), including both Independent Study (CS 4974) and Undergraduate Research (CS 4994).

2. An approved 3000- or 4000-level course in another discipline that has significant technical content relevant to the science or application of computer science can be used as a technical elective.

   a. 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.

   b. 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, 4524, 4684
      ACIS/BIT 4554, 4564
      AOE 4434
      BIT 4434, 4444, 4514, 4544, 4574, 4614
      CMDA 3605, 3606, 4604
      COMM 4374
      ECE 3544, 4524, 4550, 4560, 4564, 4580, 4704, 4984 (depending on topic)
      GEOG 4314, 4324
      GEOG/GEOS 4084
      MATH 4175, 4176, 4445, 4454
      ME 4524
      MUS 3064, 3065