

# Bachelor of Science in Computer Science

## SUGGESTED PROGRAM OF STUDY<sup>†</sup>

	Fall Semester	Spring Semester
<i>Freshman Year</i>	ENGL 101 General Education Curriculum 1 <sup>2</sup> General Education Curriculum 2 <b>MATH 231</b> <sup>3</sup> Freshman Seminar or COMP 110 <sup>1</sup>	ENGL 102 General Education Curriculum 3 General Education Curriculum 4 <b>MATH 232</b> <b>COMP 401</b>
<i>Sophomore Year</i>	General Education Curriculum 5 General Education Curriculum 6 <b>PHYS 116</b> <b>MATH 233</b> <b>COMP 410</b>	General Education Curriculum 7 General Education Curriculum 8 <b>PHYS 117</b> <b>MATH 381</b> or <b>STOR 215</b> <sup>4</sup> <b>COMP 411</b> <sup>4</sup>
<i>Junior Year</i>	General Education Curriculum 9 General Education Curriculum 10 <b>COMP 550</b> <sup>7</sup> CS Distribution Requirement 1 <sup>5,7</sup> CS Distribution Requirement 2	Free Elective Non-CS Elective 1 <sup>6</sup> <b>MATH 547</b> <sup>7</sup> CS Distribution Requirement 3 CS Distribution Requirement 4
<i>Senior Year</i>	Non-CS Elective 2 Non-CS Elective 3 Free Elective Free Elective CS Distribution Requirement 5	Non-CS Elective 4 Free Elective Free Elective <b>STOR 435</b> <sup>7</sup> CS Distribution Requirement 6

### Notes on the Freshman/Sophomore Years

1. COMP 110 (Introduction to Programming) is a required prerequisite for COMP 401 (Foundation of Programming). However, we assume most computer science students will have acquired a sufficient knowledge of programming basics prior to enrolling at UNC to skip COMP 110 and start with COMP 401. Students who are able to begin their programming education with COMP 401 may do so in their first semester and either advance the suggested program of study by one semester (giving themselves an extra free elective in their junior/senior years), or take another meritorious course such as a Freshman Seminar as an elective in the freshman year. (In either case, note that neither COMP 110 nor a Freshman Seminar are required courses in the major.)

Students with no programming experience should begin their program of study with COMP 110.

<sup>†</sup> Suggested program of study to satisfy graduation requirements that were in place as of August 2009.

2. “General Education Curriculum” refers to a set of courses that are selected according to the following College-specified requirements:

**Foundations Requirements**

ENGL 101 and 102

Foreign Language - 4

Quantitative Reasoning (QR) - 1

Lifetime Fitness (LFIT) - 1

**Approaches Requirements**

Physical and Life Sciences (PL/PX) - 2

Social and Behavioral Sciences\*

Historical Analysis (HS) - 1

Social Science/Historical Analysis (SS/HS) - 2

Humanities/Fine Arts

Visual and Performing Arts (VP) - 1

Literary Arts (LA) - 1

Philosophical Reasoning (PH) - 1

\*From at least two departments

**Connections Requirements\*\***

Communication Intensive (CI) - 1

Quantitative Intensive (QI) - 1

Experiential Education (EE) - 1

US Diversity (US) - 1

North Atlantic World (NA) - 1

Beyond the North Atlantic World (BN) - 1

World Before 1750 (WB) - 1

Global Issues (GL) - 1

\*\*Courses that satisfy a Connections requirement may also satisfy one of the Approaches requirements, other Connections requirements, a requirement in the student’s major and/or minor fields, or Supplemental Education requirements.

Students are encouraged to consult the Undergraduate Bulletin or a General College advisor for the precise definition of the General Education Curriculum.

3. Courses listed in boldface in the suggested program indicate the courses whose completion is **required** for admittance into the Computer Science major. In order to graduate students must complete the following nine courses **with a grade of C or better in each course**:

PHYS 116	Mechanics
PHYS 117	Electromagnetism and Optics
MATH 231	Calculus of Functions of One Variable I
MATH 232	Calculus of Functions of One Variable II
MATH 233	Calculus of Functions of Several Variables
MATH 381 or STOR 215	Discrete Mathematics

COMP 401	Foundations of Programming
COMP 410	Data Structures
COMP 411	Machine Organization

Students may not declare the Computer Science major until they have completed these nine courses with a grade of C or better in each course. Students who earn a grade of C- or lower in *any* of these courses *must* retake the course\* and receive a grade of C or better in order to declare the Computer Science major. Students in this situation are *strongly* advised to consult with a General College advisor to assess their suitability for the Computer Science major.

- The nine required freshman/sophomore courses should be taken in the order listed in the Program of Study and no later than the semester listed. If this ordering and minimal scheduling of courses is not followed, students will be unable to declare the Computer Science major during the nominal major declaration period in the second semester of their sophomore year.

The only exceptions to the ordering of freshman/sophomore courses are Discrete Mathematics (either MATH 381 or STOR 215) and MATH 233, which may be taken in any order, and COMP 410 and COMP 411 which may be taken in any order, subject to the following provisos:

- Students who receive a grade lower than a B in COMP 401 should take COMP 410 first to gain additional maturity in programming before taking COMP 411.
- Discrete Mathematics (MATH 381 or STOR 215) is a co-requisite for COMP 410. Hence if one takes COMP 411 before COMP 410 they will likely have to take MATH 381 or STOR 215 before MATH 233.

### Notes on the Junior/Senior Years

- “CS Distribution Requirements” refer to a set of 6 courses that are selected from the following list:

<b>Theory Group:</b> (At least 1 course)	MATH 566	Numerical Analysis
	COMP 455	Models of Languages & Computation
<b>Systems Group:</b> (At least 1 course)	COMP 431	Internet Protocols and Services
	COMP 530	Introduction to Operating Systems
	COMP 541	Digital Logic and Computer Design
	COMP 535	Introduction to Computer Security
<b>Programming Languages Group:</b> (At least 1 course)	COMP 520	Compilers
	COMP 524	Programming Language Concepts
	COMP 523	Software Engineering Laboratory
<b>Applications Group:</b> (At least 1 course)	COMP 426	Advanced WWW Programming
	COMP 521	Files and Databases
	COMP 575	Introduction to Graphics
	COMP 580	Enabling Technology
	COMP 585	Serious Games

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\* Note that the permission of a Dean is required in order to take a course for a second time.

<b>Interdisciplinary Group:</b> (At most 1 course)	MATH >520	Any MATH course numbered greater than 520
	STOR 415, 445, 515	Appropriate courses from Statistics and Operations Research
	LING 540	Appropriate courses from Linguistics
	INLS 484, 509, 512	Appropriate courses from Information & Library Science

Other computing-related courses than those listed in the Interdisciplinary Group can be counted as an Interdisciplinary course with the (advance) approval of the Director of Undergraduate Studies in the Department of Computer Science.

Note that of the six required Distribution courses, at least one course must be selected from each of the Theory, Systems, Programming Languages, and Applications groups. *Students are not required to take any courses from the Interdisciplinary Group.* However, if courses are selected from the Interdisciplinary Group, at most one of these courses may be counted towards satisfying the Distribution requirement.

Note further that not all courses are offered every semester. Students should consult the Undergraduate Bulletin and/or the Directory of Classes for the current schedule of course offerings.

6. “Non-CS Electives” refer to a set of 4 courses taken outside of Computer Science. The four courses are selected according to the following general requirements:

Humanities/Fine Arts	1 course
Social Sciences	1 course
Natural Science	1 course
Elective	1 course

The fourth elective can be any non-computing related course taken outside of Computer Science, Mathematics, Operations Research, Statistics, and Applied Math. None of these electives may be taken Pass/Fail.

7. In order to graduate, students must amass a GPA of 2.0 or higher in the nine required junior/senior courses in the major (*i.e.*, COMP 550, MATH 547, STOR 435, and the six required Distribution courses). In addition, students may not receive any grade lower than a C- in any of these nine courses.
8. The ordering of the specific required courses listed in the junior and senior years (*i.e.*, COMP 550, MATH 547, STOR 435 and the courses taken to satisfy the Distribution requirement) is merely suggestive. These courses may be taken in any order. (Note however, that COMP 550 is a prerequisite course for some of the courses in the Distribution list.)
9. Not shown in this schedule is one 1-hour Physical Education Activity that is required of all UNC students. This course may be taken at any time.