COMPUTER SCIENCE (BS)

The B.S. degree program in computer science provides a balance between theoretical foundations and applied computer science with the ultimate goal of presenting knowledge likely to be of ongoing value throughout one's career. The preparation of the B.S. is aimed at students who want to pursue a career as an industry practitioner and/or as an academic.

Among 24 civilian occupation groups analyzed by The Bureau of Labor Statistics, Computer and Information Technology is rated third highest in median pay and second highest in projected employment growth for the period 2021 to 2031.

Related Programs

Major

- Cybersecurity (BS) (https://catalog.luc.edu/undergraduate/arts-sciences/computer-science/cybersecurity-bs/)

Minor

- Computer Science Minor (https://catalog.luc.edu/undergraduate/arts-sciences/computer-science/computer-science-minor/)

Combined

- Computer Science (BS/MS) (https://catalog.luc.edu/undergraduate/accelerated-bachelors-masters-program/computer-science-bs-ms-dual-degree-programs/)

Curriculum

Code	Title	Hours
Major Requirements		
MATH 131	Applied Calculus I [1]	3 or 4
or MATH 161	Calculus I	
MATH 132	Applied Calculus II [1]	3 or 4
or MATH 162	Calculus II	
COMP 141	Introduction to Computing Tools and Techniques	3
COMP 163	Discrete Structures	3
or MATH 201	Introduction to Discrete Mathematics & Number Theory	
COMP 170	Introduction to Object-Oriented Programming	3
COMP 264	Introduction to Computer Systems	3
COMP 271	Data Structures I	3
COMP 272	Data Structures II	3
COMP 310	Operating Systems	3
COMP 317	Social, Legal, and Ethical Issues in Computing	3
COMP 363	Design and Analysis Computer Algorithms	3
COMP 371	Programming Languages	3
STAT 203	Introduction to Probability & Statistics	3
COMP-BS Restricted Electives		
Select nine credit hours from the following:		9
COMP 301	Introduction to Computer Security	
COMP 313	Object-Oriented Design	
COMP 330	Software Engineering	
COMP 332	Requirements Engineering	
COMP 339	Distributed Systems	
COMP 341	Human-Computer Interaction	
COMP 343	Computer Networks	
COMP 353	Database Programming	
COMP 364	High Performance Computing	
COMP 370	Software Quality	
COMP 379	Machine Learning	
Practicum Capstone		
Select six credits taken from one or more of the following: [2]		6
COMP 312	Open Source Software Practicum	
COMP 390	Broadening Participation in STEM (Computing, Math & Science)	
COMP 391	Internship in Computer Science	
COMP 398	Independent Study	
Computer Science 300-Level Electives		
COMP 300-Level Course(s)		4
Computer Science Free Electives		
Select one of the following:		3
COMP 300-Level Course		
COMP 125	Visual Information Processing	
COMP 150	Introduction to Computing	
Total Hours		**61-63**

[1] By arrangement with the Undergraduate Program Director, the extra credits from MATH 161 Calculus I/MATH 162 Calculus II may be applied towards the "Computer Science Free Electives" category.

[2] See the details of registering for these courses in the Computer Science Department website resources. Students are encouraged to complete these credits during junior and senior years to draw on prior experience. Note:

- COMP 312 is a 3-credit course
- COMP 390 is limited to 3 total credits
- COMP 391 and COMP 398 will usually be limited to 6 total credits each, but permission may sometimes be granted for more.

Suggested Sequence of Courses

COMP-BS Sample Schedule

The below sequence of courses is meant to be used as a suggested path for completing coursework. An individual student's completion of requirements depends on course offerings in a given term as well as the start term for a major or graduate study. Students should consult their advisor for assistance with course selection

Course	Title	Hours
Year 1		
Fall		
COMP 150	Introduction to Computing [1]	3
COMP 141	Introduction to Computing Tools and Techniques	3
MATH 131	Applied Calculus I [2]	3
CORE: Philosophical Knowledge Tier 1		3

CORE: College Writing Seminar		3
UNIV 101	First Year Seminar	1
	Hours	**16**
Spring		
COMP 170	Introduction to Object-Oriented Programming [3]	3
COMP 163	Discrete Structures	3
MATH 132	Applied Calculus II [4]	3
CORE: Historical Knowledge Tier 1		3
CORE: Ethics		3
	Hours	**15**
Year 2		
Fall		
COMP 271	Data Structures I	3
COMP 264	Introduction to Computer Systems	3
STAT 203	Introduction to Probability & Statistics [5]	3
CORE: Theology and Religious Studies Tier 1		3
CAS Language Requirement 101 level [6]		3
	Hours	**15**
Spring		
COMP 272	Data Structures II	3
COMP 317	Social, Legal, and Ethical Issues in Computing	3
CORE: Scientific Knowledge Tier 1		3
CORE: Societal & Cultural Knowledge Tier 1		3
CAS Language Requirement 102 level		3
	Hours	**15**
Year 3		
Fall		
COMP 363	Design and Analysis Computer Algorithms	3
COMP 310	Operating Systems	3
COMP Free Elective		1
CORE: Literary Knowledge & Experience Tier 1		3
CORE: Artistic Knowledge & Experience		3
CORE: Philosophical Knowledge Tier 2		3
	Hours	**16**
Spring		
COMP 371	Programming Languages	3
COMP-BS Restricted Elective		3
CORE: Theology and Religious Studies Tier 2		3
CORE: Scientific Knowledge Tier 2		3
CORE: Historical Knowledge Tier 2		3
	Hours	**15**
Year 4		
Fall		
COMP-BS Restricted Elective		3
COMP Practicum		3
CORE: Literary Knowledge & Experience Tier 2		3
CORE: Societal & Cultural Knowledge Tier 2		3
CAS Elective		3
	Hours	**15**
Spring		
COMP-BS Restricted Elective		3
COMP Practicum		3
COMP Free Elective		3
COMP Free Elective if COMP 150 not taken (3)		3
CAS Elective		3
	Hours	**15**
	Total Hours	**122**

1 COMP 150 Introduction to Computing will apply to COMP Free Electives; students with prior experience in computer programming, for example a high school course modeled on the Exploring Computer Science or Computer Science Principles curriculum may replace this course with a different COMP Free Elective at any time during the program. A score of 4 or 5 on the AP CS Principles Exam will earn actual credit for this course.

2 May substitute MATH 161 Calculus I and may use the extra credit towards COMP Free Electives.

3 A score of 4 or 5 on the AP CS A Exam will earn credit for this course.

4 May substitute MATH 162 Calculus II and may use the extra credit towards COMP Free Electives.

5 May substitute MATH 212 Linear Algebra

6 Language must be completed through the 102 course level or through an exam.

General Notes

- Credits never can be double-counted for different categories of the requirements for the major. But a course may satisfy a major requirement and also satisfy a University and/or College requirement (e.g., Core, residency, Engaged Learning, Writing Intensive).
- With permission, extra credits of MATH 161 Calculus I, MATH 162 Calculus II, or 300 level MATH, PHYS, or STAT **for double majors** can be applied to the "Computer Science 300-Level Electives" or "Computer Science Free Electives" categories.)
- It is usually not meaningful to combine a computing major or minor with another, the principal exception being CCFR-MINR; see more detail in the double-dipping rules (https://catalog.luc.edu/undergraduate/arts-sciences/computer-science/#policiestext).

College of Arts and Sciences Graduation Requirements

All Undergraduate students in the College of Arts and Sciences are required to take two Writing Intensive courses (6 credit hours) as well as complete a foreign language requirement at 102-level or higher (3 credit hours) or a language competency test. More information can be found here (https://www.luc.edu/cas/college-requirements/).

Additional Undergraduate Graduation Requirements

All Undergraduate students are required to complete the University Core, at least one Engaged Learning course, and UNIV 101. SCPS students are not required to take UNIV 101. Nursing students in the Accelerated BSN program are not required to take core or UNIV 101. You can find more information in the University Requirements (https://catalog.luc.edu/undergraduate/university-requirements/) area.

Learning Outcomes

- Knowledge of Core Computer Science Concepts: This includes understanding data structures, algorithms, computer architecture, principles of software engineering, databases, networking, and more. The goal is to give students a comprehensive grounding in the key ideas that underpin computer science.
- Problem-Solving Skills: Graduates should be able to use their knowledge of computer science to solve complex problems. This includes the ability to design, implement, and evaluate a computational system to meet a given set of requirements.
- Proficiency in Programming: Students should be proficient in at least one high-level programming language and have experience with several others. They should also be familiar with the principles of programming languages and be able to learn new languages as needed.
- Understanding of Mathematical and Scientific Principles: Graduates should understand the mathematical and scientific principles that underpin computer science. This includes discrete mathematics, probability and statistics, and more.
- Ethical and Social Implications: An understanding of professional, ethical, legal, security, and social issues and responsibilities as they pertain to computer science.
- Teamwork and Communication: Students should be able to work effectively on teams to accomplish a common goal, and they should be able to communicate their ideas and work effectively both verbally and in writing.
- Ability to Learn Independently: As technology continually evolves, it's crucial that students develop the ability to learn new tools, techniques, and concepts independently.