COMPUTER SCIENCE + COMPUTER ENGINEERING, B.A.

Most engineers own one layer of a system. Saint Louis University's CS +CE graduates own all of them — from transistors to algorithms, from real-time firmware to application software. SLU's Bachelor of Arts in Computer Science + Computer Engineering program is built for students who want to understand how computers actually work, all the way down, and to build systems that push the limits of what hardware and software can do together.

Curriculum Overview

- Computer architecture, digital logic, RTL design, and FPGA development
- Embedded systems: bare-metal firmware, RTOS, device drivers, and hardware interfaces
- Algorithms, data structures, operating systems, and systems software
- Hardware-software co-design: performance analysis, tradeoff modeling and system integration

Experiential and Applied Learning

- Internships with semiconductor firms, aerospace and defense contractors, automotive embedded systems teams, and IoT companies
- Access to SLU's hardware lab with oscilloscopes, logic analyzers, soldering stations, and PCB fabrication resources

Careers

- Embedded systems engineer, hardware-software co-design engineer, firmware engineer
- FPGA/RTL designer, systems architect, robotics engineer, SoC designer
- Typical entry salary: $85,000 – $120,000

Tuition

Tuition/Fee	Cost Per Year
Undergraduate Tuition	$58,960
University Fees	$1,000

Additional charges may apply. Other resources are listed below:

Net Price Calculator (https://www.slu.edu/financial-aid/tuition-and-costs/calculator.php)

Cost of Attendance (https://www.slu.edu/financial-aid/tuition-and-costs/cost-of-attendance.php)

Information on Tuition and Fees (https://catalog.slu.edu/academic-policies/student-financial-services/tuition/)

Miscellaneous Fees (https://catalog.slu.edu/academic-policies/student-financial-services/fees/)

Information on Summer Tuition (https://catalog.slu.edu/academic-policies/student-financial-services/tuition-summer-current/tuition-summer-current.pdf)

Scholarships and Financial Aid

For more information about Saint Louis University scholarships and financial aid, please visit the Office of Student Financial Services (https://www.slu.edu/financial-aid/types-of-aid/).

Learning Outcomes

1. Analyze a complex computing problem and apply principles of computing and other relevant disciplines to identify solutions.
2. Design, implement, evaluate and test a software system that meets a given set of computing requirements.
3. Apply computer science theory, knowledge of computer systems and software development fundamentals to produce computing-based solutions.
4. Communicate effectively to both professional and general audiences in both oral and written forms.
5. Recognize professional responsibilities and make informed judgments in computing practice based on legal and ethical principles.
6. Function effectively as a member of a team in developing computing technology and solving technical problems.
7. Synthesize principles of computer science and computer engineering to design, implement, and verify integrated hardware–software systems that meet defined performance, reliability and resource constraints.

Requirements

Code	Title	Credits
University Undergraduate Core (https://catalog.slu.edu/academic-policies/academic-policies-procedures/university-core/)		**32-35**
Major Requirements		**70-71**
Select one course with the CSCI Intro to Computer Science attribute (p. 2)		3
CSCI 1300	Introduction to Object-Oriented Programming	4
CSCI 2100	Data Structures	4
CSCI 2300	Object-Oriented Software Design	3
CSCI 2500	Computer Organization and Systems	3
CSCI 2510	Principles of Computing Systems	3
CSCI 3100	Algorithms	3
CSCI 4961	Capstone Project I	2
CSCI 4962	Capstone Project II	2
Select one Systems Elective course (p. 2)		3
Two additional 3000 or 4000 level CSCI elective courses		6
Required Mathematics Courses		
MATH 1510	Calculus I	4
MATH 1520	Calculus II	4
MATH 1660	Discrete Mathematics	3
STAT 3850	Foundation of Statistics	3

Required Computer Ethics		
PHIL 3050X	Computer Ethics	3
Computer Engineering Requirements		
ECE 1200	Computer Engineering 101	2
ECE 2205	Digital Design	3
ECE 2206	Digital Design Lab	1
ECE 3225	Microprocessors	3
ECE 3226	Microprocessors Laboratory	1
CS + CENG Electives		*7-8*
Select two of the following courses (at least one of which must have a lab)		
ECE 2101	Electrical Circuits I	
ECE 2102	Electrical Circuits II	
ECE 2103	Electrical Circuits Lab	
ECE 3205	Advanced Digital Design	
ECE 3215	Computer Systems Design	
ECE 3216	Computer Systems Design Lab	
ECE 3217	Computer Architecture and Organization	
University Electives		**14-18**
Total Credits		**120**

Introduction to Computer Science

Code	Title	Credits
CSCI 1010	Introduction to Computer Science: Principles	
CSCI 1020	Introduction to Computer Science: Bioinformatics	
CSCI 1025	Introduction to Computer Science: Cybersecurity	
CSCI 1030	Introduction to Computer Science: Game Design	
CSCI 1040	Introduction to Computer Science: Mobile Computing	
CSCI 1050	Introduction to Computer Science: Multimedia	
CSCI 1060	Introduction to Computer Science: Scientific Programming	
CSCI 1070	Introduction to Computer Science: Taming Big Data	
CSCI 1080	Introduction to Computer Science: World Wide Web	
CSCI 1090	Introduction to Computer Science: Special Topics	
CSCI 1100	Understanding and Using Artificial Intelligence	
With permission, a computing-intensive course from another discipline may be substituted as long as it is not already fulfilling another requirement. Examples of such courses include:		
BME 2000	Biomedical Engineering Computing	
CVNG 1500	Civil Engineering Computing	
STAT 3850	Foundation of Statistics	

Systems Electives Courses

Code	Title	Credits
CSCI 4500	Operating Systems	
CSCI 4530	Computer Security	
CSCI 4550	Computer Networks	
CSCI 4610	Concurrent and Parallel Programming	
CSCI 4620	Distributed Computing	

Non-Course Requirements

All School of Science and Engineering B.A. and B.S. students must complete an exit interview/survey near the end of their bachelor's program.

Continuation Standards

After declaring a computer science major, students must achieve a minimum GPA of 2.00 in computer science courses by the conclusion of their second year as a major and maintain such a GPA at the conclusion of each semester thereafter. Furthermore, students should require at most two attempts to successfully complete any computer science courses required for the major (where an unsuccessful attempt is considered a "D" or "F" for courses numbered 2100 and lower, and an "F" in higher-level courses).

Students are also expected to make adequate progress in the major, typically by enrolling in at least one computer science course per semester until completing their coursework (with exceptions made for premed scholars during their first year, and all students if studying abroad or facing other such extenuating circumstances).

Program Notes

At most, three credit hours of internship with industry courses can be applied to the degree.

Roadmap

This roadmap is just one example of a semester-by-semester plan of study for this program. There are other plans students can and do take. The plan of study for each particular student is established in consultation with each student's academic advisor; *this roadmap does not replace academic advising appointments.*

Roadmap notes:

- This Roadmap assumes full-time enrollment unless otherwise noted.
- Courses/Milestones marked with an "!" are critical and must be completed in the semester listed in the Roadmap to ensure a timely graduation.
- Course availability and sequencing are subject to change.

Course	Title	Credits
Year One		
Fall		
CSCI 1XXX	CSCI Intro to Computer Science attributed course	3
MATH 1660	Discrete Mathematics	3
CORE 1700	Ultimate Questions: Philosophy	3
CORE 1000	Ignite First Year Seminar	3
CORE 1500	Cura Personalis 1: Self in Community	1

CORE 1900	Eloquentia Perfecta 1: Written and Visual Communication	3
	Credits	**16**
Spring		
CSCI 1300	Introduction to Object-Oriented Programming	4
MATH 1510	Calculus I	4
CORE 1600	Ultimate Questions: Theology	3
ECE 1200	Computer Engineering 101	2
CORE	Equity and Global Identities: Global Interdependence	3
	Credits	**16**
Year Two		
Fall		
MATH 1520	Calculus II	4
CSCI 2100	Data Structures	4
ECE 2205 & ECE 2206	Digital Design and Digital Design Lab	4
CORE 2500	Cura Personalis 2: Self in Contemplation	0
CORE 3800	Ways of Thinking: Natural and Applied Sciences	3
	Credits	**15**
Spring		
CSCI 2500	Computer Organization and Systems	3
CSCI 2300	Object-Oriented Software Design	3
ECE 3225 & ECE 3226	Microprocessors and Microprocessors Laboratory	4
STAT 3850	Foundation of Statistics	3
CORE 3400	Ways of Thinking: Aesthetics, History, and Culture	3
	Credits	**16**
Year Three		
Fall		
ECE 3205	Advanced Digital Design	3
CSCI 2510	Principles of Computing Systems	3
CSCI 3000-level or 4000-level elective		3
CORE 1200	Eloquentia Perfecta 2: Oral and Visual Communication	3
CORE	Equity and Global Identities: Identities in Context	3
	Credits	**15**
Spring		
CSCI 3000-level or 4000-level elective		3
PHIL 3050X	Computer Ethics	3
CORE 2800	Eloquentia Perfecta 3: Creative Expression	3
Systems Elective		3
CORE 3500	Cura Personalis 3: Self in the World	1
	Credits	**13**
Year Four		
Fall		
CSCI 4961	Capstone Project I	2
CORE 4000	Collaborative Inquiry	3
CSCI 3100	Algorithms	3
CS + CENG Electives		4
CORE	Eloquentia Perfecta: Writing Intensive	3
	Credits	**15**
Spring		
CSCI 4962	Capstone Project II	2
CS + CENG Elective		3
CORE 4500	Reflection-in-Action	0
CORE 3600	Ways of Thinking: Social and Behavioral Sciences	3
University Electives		6
	Credits	**14**
	Total Credits	**120**

Madrid

Saint Louis University-Madrid students can earn the Computer Science + Computer Engineering, B.A., taking courses that will allow them to understand the software and hardware of real-world systems.

Curriculum Overview

Students should consult their advisor to ensure their plan of study meets the timely offerings of SLU-Madrid.

Faculty

The faculty at Saint Louis University-Madrid are experts in their respective fields. They are internationally recognized teachers, researchers and mentors. Learn about our faculty members (https://www.slu.edu/madrid/academics/faculty/faculty-profiles.php), including their education, credentials, experience and contact information.

Faculty Research

The SLU-Madrid faculty maintains robust programs of research in a variety of fields. See below for more data.

Find Faculty Research Information (https://www.slu.edu/madrid/academics/faculty/faculty-research.php)

Find Research Resources (https://www.slu.edu/madrid/academics/faculty/research-resources.php)

Admission

SLU-Madrid Application (https://www.slu.edu/madrid/apply.php)

Application Deadlines

- April 1 - Fall admission (July 1 for EU students)
- Aug. 1 - Spring admission (Nov. 1 for EU students)
- March 1 - Summer sessions (for applicants who require a student visa)
- April 1 - Summer sessions (for applicants who do not require a student visa)

Contact Us

Office of Admissions
Avenida del Valle, 34
28003 Madrid, Spain
P. (+34) 91 554 58 58
admissions-madrid@slu.edu

Office Hours: Mondays through Fridays: 9 a.m. to 6 p.m. (3 p.m. on Fridays from May 15 - Sept. 1)

Tuition and Fees

SLU-Madrid is committed to providing a quality Jesuit education at an affordable price. Tuition rates at SLU-Madrid are approximately 40% lower than at comparable private universities in the U.S.

If you have questions or would like to speak with a financial aid officer, email us at financialaid-madrid@slu.edu.

- Tuition and Fees (https://www.slu.edu/madrid/admissions/tuition-fees.php)
- Scholarships and Financial Aid (https://www.slu.edu/madrid/admissions/scholarships-financial-aid.php)

Contact Us

For more information about computer science programs, please call 314-977-6667 or email cs@slu.edu.