

Computer Science and Computer Engineering Electives

This document lists the courses that can be used to meet CSE Elective requirements for the Computer Science and Computer Engineering programs. This page is current for academic year 2021-22. Note that older catalogs may have different course numbers, different options, and/or different requirements. Check with the Department Undergraduate Advisor concerning possible courses not listed including several 5000-level courses that may be suitable for undergraduate students. This list is provided as a guide; the Undergraduate Catalog remains as the definitive source of requirements. *Note that not all of the courses listed below will be offered in any given academic year.*

Notes:

- 1) CEN 4020 Software Engineering is a required course starting with 2017 catalog year. CNT 4419 Secure Coding is a required course starting with 2018 catalog year. COP 3331 Object Oriented Design is no longer a required course starting with 2021 catalog year.
- 2) See USF Course Inventory for course descriptions and a listing of prerequisites.
- 3) CIS 4930 is the designation for special topic courses. These courses could be software, hardware, or theory, depending on course content.
- 4) The nominal prerequisite for all elective courses (including CIS 4930 and CIS 4900, CIS 4915, and CIS 4940) is Computer Logic and Design (CDA 3201) and Data Structures (COP 4530), however some courses may have a prerequisite other than CDA 3201 and COP 4530; this may be noted in OASIS. USF Course Inventory lists courses prerequisites.
- 5) Students are allowed to count a maximum of three (3) hours of an elective programming language as a software elective.
- 6) Students on the 2021 catalog year who have taken COP 3331 Object Oriented Design (while on a previous catalog year) may count this course as a software elective.
- 7) Students are allowed to count as elective credit a maximum of six (6) hours combined of CIS 4900 and/or any other supervised individual study (that is, CIS 4915 and CIS 4940).

Courses are identified as elective or required by program.

Software courses

Course ID	Course Name	Computer Science	Computer Engineering
CAP 4034	Computer Animation Fundamentals	Elective	Elective
CAP 4063	Web Application Design	Elective	Elective
CAP 4401	Image Processing Fundamentals	Elective	Elective
CAP 4410	Computer Vision	Elective	Elective
CAP 4662	Introduction to Robotics	Elective	Elective
CEN 4020	Software Engineering	Required	Elective
CEN 4072	Software Testing	Elective	Elective
CAP 4621	Introduction to AI	Elective	Elective
CIS 4345	Big Data Storage and Analysis with Hadoop	Elective	Elective
CIS 4623	Practical Cybersecurity	Elective	Elective

COP 4520	Programming on Massively Parallel Systems	Elective	Elective
CAP 4628	Affective Computing	Elective	Elective
CNT 4800	Network Science	Elective	Elective
CAP 4103	Mobile Biometrics	Elective	Elective
CAP 4773	Social Media Mining	Elective	Elective
CNT 4004	Computer Networks I	Elective	Elective
CNT 4411	Computing and Network Security	Elective	Elective
CNT 4419	Secure Coding	Required	Elective
COP 4020	Programming Languages	Elective	Elective
COP 4365	Software Systems Development	Elective	Elective
COP 4620	Compilers	Elective	Elective
COP 4656	Software Development for Mobile Devices	Elective	Elective
COP 4710	Database Design	Elective	Elective
CAP 4111	Intro to Augmented and Virtual Reality	Elective	Elective
CAP 4641	Natural Language Processing	Elective	Elective

Hardware courses

Course ID	Course Name	Computer Science	Computer Engineering
CDA 4203/4203L	Computer System Design & Lab	Elective	Required
CDA 4213/4213L	CMOS/VLSI Design & Lab	Elective	Required
CDA 4253	FPGA Design and Analysis	Elective	Elective
CDA 4621	Control of Mobile Robots	Elective	Elective
CIS 4930	Digital Circuit Synthesis	Elective	Elective
CIS 4930	Embedded Systems	Elective	Elective
CDA 4322	Principles of Secure Hardware Design	Elective	Elective
CDA 4321	Cryptographic Hardware and Embed Sys	Elective	Elective
CAP 4160	Brain-Computer Interfaces	Elective	Elective
CIS 4930	VLSI Testing	Elective	Elective

Theory courses

Course ID	Course Name	Computer Science	Computer Engineering
COT 4210	Automata Theory and Formal Languages	Elective	Elective
COT 4521	Computational Geometry	Elective	Elective
CIS 4212	Privacy Preserving Infrastructures	Elective	Elective
COT 4601	Quantum Computing	Elective	Elective

Other courses

Course ID	Course Name	Computer Science	Computer Engineering
CIS 4900	Independent Study	Elective	Elective
CIS 4910	Senior Project	Elective	Required
CIS 4915	Supervised Research	Elective	Elective
CIS 4940	Industry Internship	Elective	Elective

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