COMPUTER ENGINEERING (CSE)

CSE 200 Selected Topics (1-6 Credits)
Engineering & Comp Sci
Exploration of a topic (to be determined) not covered by the standard curriculum but of interest to faculty and students in a particular semester.
Repeatable

CSE 261 Digital Logic Design (3 Credits)
Engineering & Comp Sci
Number representations, Boolean Algebra, logic minimization, memory circuits, counters, state diagrams, state machine design, arithmetic circuits, and asynchronous circuits. Logic simulators will be used to demonstrate and provide students with design activities.
Shared Competencies: Information Literacy and Technological Agility (https://coursecatalog.syracuse.edu/shared-competencies/information-literacy-and-technological-agility/)

CSE 262 Digital Logic Design Laboratory (1 Credit)
Engineering & Comp Sci
Basic digital logic circuit design and implementation. Logic-circuit design and testing using a Hardware Description Language and FPGAs. Digital system design, including coding, testing, synthesis, troubleshooting and documentation.
Coreq; CSE 261
Shared Competencies: Information Literacy and Technological Agility (https://coursecatalog.syracuse.edu/shared-competencies/information-literacy-and-technological-agility/)

CSE 270 Experience Credit (1-6 Credits)
Engineering & Comp Sci
Participation in a discipline or subject related experience. Student must be evaluated by written or oral reports or an examination. Permission in advance with the consent of the department chairperson, instructor, and dean. Limited to those in good academic standing.
Repeatable

CSE 280 International Course (1-12 Credits)
Engineering & Comp Sci
Offered through SUAbroad by educational institution outside the United States. Student registers for the course at the foreign institution and is graded according to that institution's practice. SUAbroad works with the S.U. academic department to assign the appropriate course level, title, and grade for the student's transcript.
Repeatable

CSE 283 Introduction to Object-Oriented Design (3 Credits)
Engineering & Comp Sci
Present fundamental software design concepts of functional decomposition and object-oriented design. Use both C++ and Java to implement design projects which will be completed to demonstrate the design concepts.
Prereq: CIS 151
Shared Competencies: Critical and Creative Thinking (https://coursecatalog.syracuse.edu/shared-competencies/critical-and-creative-thinking/); Information Literacy and Technological Agility (https://coursecatalog.syracuse.edu/shared-competencies/information-literacy-and-technological-agility/)

CSE 290 Independent Study (1-6 Credits)
Engineering & Comp Sci
Exploration of a problem, or problems, in depth. Individual independent study upon a plan submitted by the student. Admission by consent of supervising instructor(s) and the department.
Repeatable

CSE 370 Independent Study (1-6 Credits)
Engineering & Comp Sci
Exploration of a problem, or problems, in depth. Individual independent study upon a plan submitted by the student. Admission by consent of supervising instructor(s) and the department.
Repeatable

CSE 380 International Course (1-12 Credits)
Engineering & Comp Sci
Offered through SUAbroad by educational institution outside the United States. Student registers for the course at the foreign institution and is graded according to that institution's practice. SUAbroad works with the S.U. academic department to assign the appropriate course level, title, and grade for the student's transcript.
Repeatable

CSE 381 Computer Architecture (3 Credits)
Engineering & Comp Sci
Data representation, memory hierarchies, protection, specialized processors, multiple computers, performance evaluation, and reliability.
Prereq: CSE 261
Shared Competencies: Information Literacy and Technological Agility (https://coursecatalog.syracuse.edu/shared-competencies/information-literacy-and-technological-agility/)

CSE 382 Algorithms & Data Structures (3 Credits)
Engineering & Comp Sci
Data structures and algorithms implemented in high-level language. Nonnumeric processing, including database management. Types, structures, pointers, linked lists, recursion, iteration, retrieval, pattern recognition, and context processing.
Prereq: CSE 283

CSE 384 Systems and Network Programming (3 Credits)
Engineering & Comp Sci
Unix programming and shell scripting for systems and network software. Makefiles, compilers, linkers, debuggers, software with multiple source files. Dynamic memory allocation, system calls, C programming, pointers, concurrent/parallel programming, defensive programming techniques, network programming.
Prereq: CSE 283 or CIS 351
Shared Competencies: Information Literacy and Technological Agility (https://coursecatalog.syracuse.edu/shared-competencies/information-literacy-and-technological-agility/)

CSE 389 Web System Architecture and Programming (3 Credits)
Engineering & Comp Sci
Issues involved in architecting and programming Web servers and clients. Topics include Java Socket Programming; Java Thread Programming; HTTP; Apache HTTP Server; PHP/Python scripting; Java Servlets; JSP.
Prereq: CIS 351 OR CSE 283
Shared Competencies: Information Literacy and Technological Agility (https://coursecatalog.syracuse.edu/shared-competencies/information-literacy-and-technological-agility/)

CSE 390 Independent Study (1-6 Credits)
Engineering & Comp Sci
Exploration of a problem, or problems, in depth. Individual independent study upon a plan submitted by the student. Admission by consent of supervising instructor(s) and the department.
Repeatable

CSE 397 Microcontroller Laboratory (3 Credits)
Engineering & Comp Sci
Fundamentals of microcontrollers. Concepts include architecture, programming, interfacing, and communication with analog and digital components.
Prereq: CSE 262
Shared Competencies: Critical and Creative Thinking (https://coursecatalog.syracuse.edu/shared-competencies/critical-and-creative-thinking/); Information Literacy and Technological Agility (https://coursecatalog.syracuse.edu/shared-competencies/information-literacy-and-technological-agility/)

CSE 398 Embedded and Mobile Systems Laboratory (3 Credits)
Engineering & Comp Sci
Design and testing of embedded systems with an operating system. Rapid prototyping and design methods. Interfacing and network communication with mobile devices.
Coreq: CSE 384
Shared Competencies: Information Literacy and Technological Agility (https://coursecatalog.syracuse.edu/shared-competencies/information-literacy-and-technological-agility/)

CSE 400 Selected Topics (1-6 Credits)
Engineering & Comp Sci
Exploration of a topic (to be determined) not covered by the standard curriculum but of interest to faculty and students in a particular semester.
Repeatable

CSE 418 Deep Learning (3 Credits)
Engineering & Comp Sci
Basic classification models,deep neural networks, recurrent neural networks,their software implementations and state-of-art deep learning frameworks on CPU and GPU.

CSE 444 Mobile Application Programming (3 Credits)
Engineering & Comp Sci
Cross-listed with CIS 444
Double-numbered with CIS 651, CSE 651
Development of applications for different mobile devices. Creating effective user interfaces, efficient use of persistent storage, network services, GPS, maps and sensors. Additional work required of graduate students.

CSE 458 Data Networks: Basic Principles (3 Credits)
Engineering & Comp Sci
Cross-listed with ELE 458, CIS 458
Data communication networks, multilayer network architecture, data transmission fundamentals, network protocols, local and wide area networks, transport and application protocols.

CSE 461 Electronic Computers (3-4 Credits)
Engineering & Comp Sci

CSE 464 Introduction to VLSI Design (3 Credits)
Engineering & Comp Sci
Cross-listed with ELE 464
MOS VLSI technologies. CMOS digital circuits. Layout design. Simulation. Realization of digital subsystems-adders, memory, etc. Opportunities for chip fabrication and testing.
Prereq: CSE 261
Shared Competencies: Critical and Creative Thinking (https://coursecatalog.syracuse.edu/shared-competencies/critical-and-creative-thinking/); Information Literacy and Technological Agility (https://coursecatalog.syracuse.edu/shared-competencies/information-literacy-and-technological-agility/)

CSE 470 Experience Credit (1-6 Credits)
Engineering & Comp Sci
Participation in a discipline or subject related experience. Student must be evaluated by written or oral reports or an examination. Permission in advance with the consent of the department chairperson, instructor, and dean. Limited to those in good academic standing.
Repeatable

CSE 480 International Course (1-12 Credits)
Engineering & Comp Sci
Offered through SUAbroad by educational institution outside the United States. Student registers for the course at the foreign institution and is graded according to that institution's practice. SUAbroad works with the S.U. academic department to assign the appropriate course level, title, and grade for the student's transcript.
Repeatable

CSE 483 C# and Windows Programming (3 Credits)
Engineering & Comp Sci
Design and implementation of Windows 32-bit applications. Windows API techniques and Windows MFC techniques will be presented. This is a projects course.
Prereq: CSE 382 or CIS 351
Shared Competencies: Information Literacy and Technological Agility (https://coursecatalog.syracuse.edu/shared-competencies/information-literacy-and-technological-agility/)

CSE 484 Introduction to Computer and Network Security (3 Credits)
Engineering & Comp Sci
Operating system security. Authentication. Access control. Program vulnerabilities. Malicious code. Secure programming principles. TCP/IP protocols, vulnerabilities, attacks, and countermeasures. Firewalls. Intrusion detection. Secret-key and Public-key cryptography. One-way has function. Digital Signature.
Prereq: CSE 486 or CSE 384
Shared Competencies: Information Literacy and Technological Agility (https://coursecatalog.syracuse.edu/shared-competencies/information-literacy-and-technological-agility/)

CSE 486 Design of Operating Systems (3 Credits)
Engineering & Comp Sci
Design, implementation, and security aspects of modern operating system components. Resource management and protection of CPU, memory, file systems, and input/output devices. Concurrent and parallel process implementation. Process synchronization. Networking. Distributed systems.
Prereq: (CIS 341 or CSE 381) and (CSE 384 and CIS 351)
Shared Competencies: Information Literacy and Technological Agility (https://coursecatalog.syracuse.edu/shared-competencies/information-literacy-and-technological-agility/)

CSE 487 Access Control, Security and Trust (3 Credits)
Engineering & Comp Sci
Cross-listed with CIS 487
Analytical/logical basis for trusting systems. Access requests, authorizations, certificates, credentials, jurisdiction, and delegation. Applications include distributed access control, process isolation and sharing, and access policies.
Prereq: CIS 375
Shared Competencies: Critical and Creative Thinking (https://coursecatalog.syracuse.edu/shared-competencies/critical-and-creative-thinking/); Information Literacy and Technological Agility (https://coursecatalog.syracuse.edu/shared-competencies/information-literacy-and-technological-agility/)

CSE 488 Introduction to Internet Security (3 Credits)
Engineering & Comp Sci
Network attack techniques and methods to defend them. Topics include vulnerabilities of TCP/IP protocols, denial of service attacks, intrusion detection, firewalls, tracing the source of attacks, anonymous communication, IPsec, virtual private network, and PKI.
Prereq: CSE 486
Shared Competencies: Information Literacy and Technological Agility (https://coursecatalog.syracuse.edu/shared-competencies/information-literacy-and-technological-agility/)

CSE 490 Independent Study (1-6 Credits)
Engineering & Comp Sci
Exploration of a problem, or problems, in depth. Individual independent study upon a plan submitted by the student. Admission by consent of supervising instructor(s) and the department.
Repeatable

CSE 491 Senior Design Project I (3 Credits)
Engineering & Comp Sci
Design methodology and presentation techniques for one extensive team project to be completed in the follow-up course. Focus on design processes and associated technical documentation. Must be taken in sequence with CSE 492.
Prereq: CSE 398 or ELE 392
Shared Competencies: Information Literacy and Technological Agility (https://coursecatalog.syracuse.edu/shared-competencies/information-literacy-and-technological-agility/)

CSE 492 Senior Design Project II (3 Credits)
Engineering & Comp Sci
Prototyping, construction, and demonstration skills for one extensive project created by a team of students. Must be taken in sequence with CSE 491.
Prereq: CSE 491
Shared Competencies: Information Literacy and Technological Agility (https://coursecatalog.syracuse.edu/shared-competencies/information-literacy-and-technological-agility/)

CSE 499 Honors Capstone Project (1-3 Credits)
Engineering & Comp Sci
Completion of an Honors Capstone Project under the supervision of a faculty member.
Repeatable 3 times for 3 credits maximum

CSE 500 International Course (1-12 Credits)
Engineering & Comp Sci
Offered through SUAbroad by educational institution outside the United States. Student registers for the course at the foreign institution and is graded according to that institution's practice. SUAbroad works with the S.U. academic department to assign the appropriate course level, title, and grade for the student's transcript.
Repeatable

CSE 561 Digital Machine Design (3 Credits)
Engineering & Comp Sci
Behavioral and structural design methods and examples using a hardware description language (VHDL). Control, arithmetic, bus systems, memory systems. Logic synthesis from hardware language descriptions.
Prereq: CSE 261

CSE 564 Vlsi Design Methods (3 Credits)
Engineering & Comp Sci

CSE 581 Introduction to Database Management Systems (3 Credits)
Engineering & Comp Sci
DBMS building blocks; entity-relationship and relational models; SQL/Oracle; integrity constraints; database design; file structures; indexing; query processing; transactions and recovery; overview of object relational DBMS, data warehouses, data mining.
Prereq: CSE 382 or CIS 351
Shared Competencies: Information Literacy and Technological Agility (https://coursecatalog.syracuse.edu/shared-competencies/information-literacy-and-technological-agility/)

CSE 590 Independent Studies (1-6 Credits)
Engineering & Comp Sci
Exploration of a problem, or problems, in depth. Individual independent study upon a plan submitted by the student. Admission by consent of supervising instructor(s) and the department.
Repeatable

CSE 591 Special Problems in Computer Systems Engineering (1-4 Credits)
Engineering & Comp Sci
Students work on special projects. Instructors present new or special material.
Repeatable 30 times for 30 credits maximum