GRADUATE COURSES

The following list contains all graduate courses that can appear on the Computer Science schedule, including selected courses offered by other departments. (The schedules for the 2023-2024 academic year are available, together with schedules for previous years.) Please note that some courses are experimental and may not be offered on a regular basis. These may be subject to change each academic year.

Regular Courses:

- CS 515 Parallel Programming
- CS 518 Cultural Competence in Computing
- CS 530 Internet, Web, & Cloud Systems
- CS 531 Introduction to Performance Measurement, Modeling and Analysis
- CS 532 Operating System Foundations
- CS 533 Concepts of Operating Systems
- CS 535 Accelerated Computing with GPU's and Xeon Phi
- CS 538 Computer Architecture
- CS 540 Deep Learning: Computational Structures and Programming
- CS 541 Artificial Intelligence
- CS 545 Machine Learning
- CS 547 Computer Graphics
- CS 551 Numerical Computation
- CS 554 Software Engineering
- CS 557 Functional Programming
- CS 558 Programming Languages
- CS 563 Intro to Web Development
- CS 564 Front End Web Development
- CS 565 Full Stack Web Development
- CS 566 Voice Assistants
- CS 569 Scholarship Skills for Computer Science & Engineering
- CS 576 Computer Security Research Seminar
- CS 577 Modern Language Processors
- CS 578 Programming Language Semantics
- CS 580 Randomized Algorithms and Probabilistic Analysis
- CS 581 Theory of Computation
- CS 584 Algorithm Design & Analysis
- CS 585 Cryptography

- CS 586 Introduction to Database Management Systems
- CS 587 Database Management Systems Implementation
- CS 588 Cloud & Cluster Data Management
- CS 589 Blockchain Development & Security
- CS 590 Introduction to Multimedia Computing and Networking
- CS 591 Introduction to Computer Security
- CS 592 Malware Reverse Engineering
- CS 593 Digital Forensics
- CS 594 Internetworking Protocols
- CS 595 Web and Cloud Security
- CS 596 Network Security
- CS 658 Programming Languages
- CS 669 Scholarship Skills for Computer Science & Engineering
- CS 676 Computer Security Research Seminar
- CS 677 Modern Language Processors
- CS 678 Programming Language Semantics
- CS 684 Algorithm Design & Analysis

Special Topic Courses (Active):

- CS 510 Top: Advanced Topics in C++ Programming
- CS 510 Top: Advanced Topics in Concurrency
- CS 510 Top: Advanced Topics in Program Verification
- CS 510 Top: Adventures in Natural Language Processing
- CS 510 Top: Code Large Language Models
- CS 510 Top: Code Reading & Review
- CS 510 Top: Programming Language Compilation
- CS 510 Top: Computational Photography
- CS 510 Top: Computer Game Design
- CS 510 Top: Computer Vision and Deep Learning
- CS 510 Top: Computers, Sound and Music
- CS 510 Top: Contemporary Software Development with Java and Android
- CS 510 Top: Data Clustering
- CS 510 Top: Data Engineering
- CS 510 Top: Ethics in Artificial Intelligence
- CS 510 Top: Exploring Fractals
- CS 510 Top: Formal Proof Foundations
- CS 510 Top: Foundations of Computer Vision
- CS 510 Top: Foundations of Emerging Technologies
- CS 510 Top: Generative Security Applications
- CS 510 Top: Graphical Models for Optimization and Learning
- CS 510 Top: Introduction to Computational Imaging
- CS 510 Top: Introduction to Computational Photography

- CS 510 Top: Introduction to Data Mining
- CS 510 Top: Introduction to Healthcare Data Analytics
- CS 510 Top: Introduction to Privacy-aware Computing
- CS 510 Top: Introduction to Quantum Computing
- CS 510 Top: Large Language Models
- CS 510 Top: Mobile and Wireless Networks
- CS 510 Top: Mobile Health
- CS 510 Top: Mobile Health in the COVID Era
- CS 510 Top: Natural Language Processing
- CS 510 Top: Networked Markets
- CS 510 Top: Operating System Internals
- CS 510 Top: Programming Language Compilation
- CS 510 Top: Proof Assistants and Program Verification
- CS 510 Top: Reinforcement Learning
- CS 510 Top: Rust for Small Systems Programming
- CS 510 Top: Rust Programming
- CS 510 Top: Rust Web Development
- CS 510 Top: Secure System Administration and DevOps
- CS 510 Top: The Joy of Coding with Java and Android
- CS 510 Top: Unconventional Cameras
- CS 510 Top: Usability Engineering
- CS 510 Top: Wireless Networks and Applications
- CS 610 Top: Computational Photography
- CS 610 Top: Graphical Models for Optimization and Learning
- CS 510 Top: Virtual Reality

Other Courses:

- CS 520 Object-Oriented Programming and Design
- CS 542 Advanced Artificial Intelligence: Combinatorial Games
- CS 543 Advanced Artificial Intelligence: Combinatorial Search
- CS 546 Advanced Topics in Machine Learning
- CS 549 Computational Geometry
- CS 550 Parallel Algorithms
- CS 552 Building Software Systems with Components
- CS 553 Design Patterns
- CS 555 Software Specification and Verification
- CS 556 Software Implementation and Testing
- CS 559 Software Measurement & Models
- CS 560 Human-Computer Interaction
- CS 561 Open Source Software Development Laboratory
- CS 562 Advanced Open Source Software Engineering
- CS 567 The Wireless Web

- CS 568 Functional Logic Programming
- CS 570 Machine Learning Seminar
- CS 572 Operating System Internals
- CS 575 Computer Systems Analysis
- CS 579 Formal Verification of Hardware/Software Systems
- CS 582 Theory of Computation: Advanced Topics
- CS 583 Automata and Formal Languages
- CS 597 Sensor Networks
- CS 598 Introduction to Wireless Network Protocols
- CS 653 Design Patterns
- CS 655 Software Specification and Verification
- CS 656 Software Implementation and Testing
- CS 659 Software Measurement & Models
- CS 668 Functional Logic Programming
- CS 672 Operating System Internals

Other Special Topic Courses:

- CS 510 Top: Advanced Functional Programming
- CS 510 Top: Advanced Java Programming
- CS 510 Top: Algorithms Coding
- CS 510 Top: Generative AI
- CS 510 Top: Introduction to HCI
- CS 510 Top: Introduction to Visual Computing
- CS 510 Top: Languages and Low-Level Programming
- CS 510 Top: Markets and the Internet
- CS 510 Top: Modern Agile and Other XP Software Engineering
- CS 510 Top: Modern Embedded Computing
- CS 510 Top: Network Security
- CS 510 Top: Practicum in Asynchronous Systems and Algorithms
- CS 510 Top: Software Design Patterns
- CS 510 Top: Spoken Language Interfaces
- CS 510 Top: Theorem Proving and Program Verification
- CS 510 Top: Topics in Software Validation
- CS 510 Top: Unit Test Branching Strategy
- CS 510 Top: User Interfaces
- CS 510 Top: Compilers and Interpreters

To review course descriptions of previously offered courses, please contact the instructor or review the PSU Bulletin.

CS CATALOGS

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