MASEEH COLLEGE OF ENGINEERING AND COMPUTER SCIENCE

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 <u>2023-2024 academic year</u> are available, together with <u>schedules for previous years</u>.) 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
- <u>CS 538 Computer Architecture</u>
- 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
- <u>CS 578 Programming Language Semantics</u>
- CS 580 Randomized Algorithms and Probabilistic Analysis
- CS 581 Theory of Computation
- CS 584 Algorithm Design & Analysis
- CS 585 Cryptography

- <u>CS 586 Introduction to Database Management Systems</u>
- <u>CS 587 Database Management Systems Implementation</u>
- 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
- <u>CS 594 Internetworking Protocols</u>
- 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
- <u>CS 677 Modern Language Processors</u>
- <u>CS 678 Programming Language Semantics</u>
- CS 684 Algorithm Design & Analysis

Special Topic Courses (Active):

- CS 510 Top: Advanced Topics in C++ Programming
- <u>CS 510 Top: Advanced Topics in Concurrency</u>
- CS 510 Top: Advanced Topics in Program Verification
- <u>CS 510 Top: Adventures in Natural Language Processing</u>
- <u>CS 510 Top: Code Large Language Models</u>
- 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
- <u>CS 510 Top: Formal Proof Foundations</u>
- 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
- <u>CS 510 Top: Large Language Models</u>
- CS 510 Top: Mobile and Wireless Networks
- <u>CS 510 Top: Mobile Health</u>
- 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
- <u>CS 510 Top: Proof Assistants and Program Verification</u>
- <u>CS 510 Top: Reinforcement Learning</u>
- 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
- <u>CS 510 Top: Unconventional Cameras</u>
- CS 510 Top: Usability Engineering
- <u>CS 510 Top: Wireless Networks and Applications</u>
- 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
- <u>CS 542 Advanced Artificial Intelligence: Combinatorial Games</u>
- CS 543 Advanced Artificial Intelligence: Combinatorial Search
- CS 546 Advanced Topics in Machine Learning
- CS 549 Computational Geometry
- <u>CS 550 Parallel Algorithms</u>
- <u>CS 552 Building Software Systems with Components</u>
- <u>CS 553 Design Patterns</u>
- <u>CS 555 Software Specification and Verification</u>
- CS 556 Software Implementation and Testing
- <u>CS 559 Software Measurement & Models</u>
- <u>CS 560 Human-Computer Interaction</u>
- CS 561 Open Source Software Development Laboratory
- CS 562 Advanced Open Source Software Engineering
- <u>CS 567 The Wireless Web</u>

- CS 568 Functional Logic Programming
- CS 570 Machine Learning Seminar
- CS 572 Operating System Internals
- CS 575 Computer Systems Analysis
- <u>CS 579 Formal Verification of Hardware/Software Systems</u>
- CS 582 Theory of Computation: Advanced Topics
- <u>CS 583 Automata and Formal Languages</u>
- <u>CS 597 Sensor Networks</u>
- CS 598 Introduction to Wireless Network Protocols
- <u>CS 653 Design Patterns</u>
- <u>CS 655 Software Specification and Verification</u>
- 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
- <u>CS 510 Top: Software Design Patterns</u>
- CS 510 Top: Spoken Language Interfaces
- <u>CS 510 Top: Theorem Proving and Program Verification</u>
- 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.







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