Computer Science (CS)

CS 110 Introduction to Microcomputer Applications
3 credits , ELEC
Quarter(s): S, F, W, Sp

Introduces microcomputers and software applications. Presents Windows, word processing, and electronic spreadsheets basics.

Prerequisite: Ability to use a keyboard

CS 170 Fundamentals of Computer Programming
5 credits , ELEC
Quarter(s): F, W, Sp

Offers an introduction to computer programming concepts and the development of applications. Program development, style, testing, and documentation are presented, discussed and applied using the C++ programming language. This is a beginning course for CS majors and others, such as engineering transfer students, wishing an introduction to structured computer programming. Lab hours are required for this course.

Prerequisites: MATH 88 (or higher) with a grade of C or better; a knowledge of MS Windows; or instructor permission.

CS 175 Event-Driven Programming UWP C#
5 credits , REEL
Quarter(s): Sp

Offers an introduction to designing and implementing Windows applications using C#. Covers concepts involving event-driven programming, graphical user interface design, and algorithm implementation are covered.

Prerequisites: CS 170 with a grade of C or better, or instructor permission

CS 208 Introduction to Management Information Systems
5 credits
Quarter(s): W

Introduction to the principles, roles, and application of Management Information Systems (MIS) in business. Investigations into MIS include hands-on lab experiences and case studies.

Prerequisite: BUS& 101, ENGL& 101, or instructor permission. CS 110 recommended.

CS 270 Data Structures I
5 credits , REEL , NSCI
Quarter(s): F

Offers a detailed study of structured and object-oriented programming, including algorithms, searching and sorting, and data structures using the programming language C++.

Prerequisite: CS 170 with a grade of C or better.

CS 275 Object-Oriented Programming
5 credits , REEL
Quarter(s): W

Offers an introduction to the object-oriented programming paradigm using Java. Discusses various object-oriented programming concepts. Develop and implement object-oriented programs. Context: CS 275 is a requirement for the CS Software Development Specialist AAS and AAS-T degrees and for the Undergraduate.

Prerequisite: CS 170 with a grade of C or better or instructor¿s permission.

CS 280 Advanced Data Structures
5 credits , REEL
Quarter(s): Sp

Offers a detailed study of advanced data structures, including the analysis of algorithms and object-oriented programming using the programming language C++. Context: CS 280 is offered for those students seeking a BS degree in computer science. CS 280 is a required course for students who wish to transfer to WSU-V as juniors and work toward a BS degree in CS. CS 280 is also required to obtain the AS-T degree in Computer Science.

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Prerequisites: CS 270 and MATH& 141 (was MATH 112), both with a grade of C or better, or instructor¿s permission.

CS 285 Programming Tools
5 credits , REEL
Quarter(s): Sp

Discusses programming techniques using C and C++ including debugging tools, scripting languages, UNIX programming tools, and familiarity with Unix/Linux system programming. Lab hours are required for this course.

Prerequisite: CS 270 with a grade of C or better, or instructor permission.

CS 288 Cooperative Work Experience
1 – 15 credits

Provides work-based learning experience in a specific program of study. Individualized student outcomes are developed, focusing on behaviors that contribute to workplace success.

Prerequisites: Instructor or Cooperative Education Coordinator permission
Concurrent requirements: COLL 289 or BUS 294 must be taken prior to or concurrent with this course.

CS 299 Independent Study
1 – 10 credits

Offers individualized learning opportunities for knowledge or skill development. Content and expectations are established between the student and instructor, and documented in an Independent Study contract.

Prerequisites: By instructor permission only.

CS 305 Linear Algebra with CS Applications
5 credits
Quarter(s): F

Introduces the fundamentals of linear algebra in the context of computer science applications such as machine learning, computer graphics, quantum computing. Includes definitions of vectors and matrices, their various operations, linear functions and equations, and least squares, including the basics of floating point computation and numerical linear algebra and other topics. Lab hours are required for this course.

Prerequisites: None Co-requisites:
Restricted to BS in Computer Science or instructor permission

CS 310 Programming Languages
5 credits , ELEC
Quarter(s): F

Introduces the design and implementation of programming languages. Explores organization and structure of programming languages, run time behavior and requirements of programs, and programming language specification. Teaches the programming models underlying different programming paradigms such as functional, logic, scripting and object-oriented languages.

Prerequisites: None

CS 318 Computer Architecture
5 credits
Quarter(s): W

Introduction to hardware architectures, layout and operators of machines. Topics include number representation, CPU/GPU concepts, interaction of hardware and software, wired/microprogramming control, memory concepts, IO, assembly and pipeline.

Prerequisites: None

CS 320 Databases and Information Management Systems
5 credits
Quarter(s): W

Introduces the architecture, implementation, and application of databases in computing. Includes relational database design, entity-relationship modeling, SQL programming, and an introduction to data management principles. Covers NoSQL and cloud-based databases to understand diverse data solutions. Apply concepts in real-world scenarios through projects that reinforce effective data storage and access strategies

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to prepare for upper-level database coursework.

Prerequisites: None

CS 334 Data Structures and Algorithms
5 credits
Quarter(s): W

Continue exploration of data structures and algorithms by investigating real-world applications of algorithms such as undirected graphs, directed graphs, minimum spanning trees, shortest paths, tries, regular expressions, reductions, and intractability.

Prerequisites: None

CS 340 Operating Systems
5 credits
Quarter(s): Sp

Explores the services operating systems provide to executing processes and their secure access. Includes memory management, concurrent process management, resource management, system call implementation, file systems, and memory protection.

Prerequisites: None

CS 350 Software Engineering
5 credits
Quarter(s): Sp

Learn fundamentals of software engineering including analysis of system requirements, software design principles, patterns, evaluation of appropriate engineering compromises, and application of collaborative software development practices and tools.

Prerequisites: None

CS 402 Statistical Methods for User Research
5 credits
Quarter(s): F

Includes summarizing data and computing margins of error, determining statistical significance, finding appropriate sample sizes for a study, and investigating relationships among variables in the context of quantitative user research.

Prerequisites: None

CS 410 Computer Networks
5 credits
Quarter(s): F

Teaches the fundamentals of computer networks, with emphasis on the Internet. Covers basic concepts of computer networks, layered network architecture, protocols, network programming interfaces, and concept of network performance. Provides students with the opportunity to have hands-on experience by network programming.

Prerequisites: None

CS 420 Cloud Computing Software and Services
5 credits
Quarter(s): F

Covers fundamentals & strategies for moving & developing apps & data storage in the cloud. Analyze cloud-based offerings & compare them for suitability to specific app & infrastructure needs. Learn to deploy apps to the cloud, utilize cloud-based services, develop cloud specific apps, and explore legal and ethical issues specific to the cloud computing environment.

Prerequisites: None

CS 430 Software Design and Implementation
5 credits
Quarter(s): W

Provides a comprehensive overview of current processes, practices & tools used to manage software development projects. Explores concepts and techniques for design and construction of reliable and maintainable software systems in modern high-level languages; program structure and design; program-correctness approaches, including testing; and event-driven programming (e.g., graphical user interface). Includes substantial project and software-team experience.

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Prerequisites: None

CS 435 Secure Software Development
5 credits
Quarter(s): Sp

Explores techniques, methodologies, and processes for development of robust, secure software. Covers security development process, threat modeling, common software vulnerabilities, web site vulnerabilities, defensive coding practices, security testing.

Prerequisites: None

CS 440 Software Design Team Project
5 credits
Quarter(s): W

Apply best practices for planning, organizing, scheduling, & controlling software projects using a combination of case studies and projects. Focuses on collaborative software development, emphasizing project management within team environments. Include unit and integration testing, bug tracking, configuration management, software process models, and object-oriented design using UML. Emphasizes legal & ethical issues that relate to project management.

Prerequisites: None

CS 450 Security Foundations
5 credits
Quarter(s): Sp

Explore elements of security and common threats. Covers various types of cyber attacks and risks to a system as well as fundamentals for mitigating those risks.

Prerequisites: None

CS 455 Data Science Development
5 credits
Quarter(s): Sp

Explores the fundamentals of data science with topics that include data wrangling, visualization, exploratory data analysis, and machine learning. Gain hands-on data science experience with Python or R.

Prerequisites: None

CS 495 Capstone/Internship
5 credits
Quarter(s): Sp

Provides students an opportunity to apply, integrate, and demonstrate their knowledge and skills throughout their undergraduate technology and computing education. Emphasizes legal & ethical issues that relate to project management. Assesses the student's ability to show mastery through practical examinations, oral presentations, and written work. Take this course in the last quarter of enrollment.

Prerequisites: None

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