# Scope & Sequence

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| Course Name: Computer Programming I **PEIMS Code:** 13027600 | | | **Course Credit:** 1.0  **Course Requirements:** Grade Placement 10-12.  **Prerequisite:** None.  **Recommended Prerequisites:** Principles of Information Technology and Algebra l. |
| **Course Description:** In Computer Programming I, students will acquire knowledge of structured programming techniques and concepts appropriate to developing executable programs and creating appropriate documentation. Students will analyze the social responsibility of business and industry regarding the significant issues relating to the environment, ethics, health, safety, and diversity in society and in the workplace as related to computer programming. Students will apply technical skills to address business applications of emerging technologies. | | | |
| **NOTE:** This is a suggested scope and sequence for the course content. This content will work with any textbook or instructional materials. If locally adapted, make sure all TEKS are covered. | | | |
| **Total Number of Periods**  **Total Number of Minutes**  **Total Number of Hours** | 175 Periods  7920 Minutes  132 Hours\* | \*Schedule calculations based on 175/180 calendar days. For 0.5 credit courses, schedule is calculated out of 88/90 days. Scope and sequence allows additional time for guest speakers, student presentations, field trips, remediation, extended learning activities, etc. | |
| **Unit Number, Title, and Brief Description** | **# of Class Periods\***  (assumes 45-minute periods)  Total minutes per unit | **TEKS Covered**  **130.309. (c) Knowledge and Skills** | |
| **Unit 1: Career Exploration and Employability**  Students will expand their knowledge base and interest in careers and entrepreneurship opportunities in the field of Information Technology. Students will explore and discuss employment opportunities and industry certifications and requirements in small groups and as a class as they develop individualized career preparation plans. Students will discover and use resources available through Computer and Technology Student Organizations (CTSO) or other extracurricular organization(s) to further develop leadership and employability skills. Students will discuss and demonstrate appropriate and proper etiquette and behavior as well as effective listening and speaking skills in this and in all units as they further develop their personal and career goals and increase their interpersonal and employability skills. | 10 periods  450 minutes | (1) The student demonstrates the necessary skills for career development, maintenance of employability, and successful completion of course outcomes. The student is expected:  (A) employ effective reading and writing skills;  (B) employ effective verbal and nonverbal communication skills;  (C) solve problems and think critically;  (D) demonstrate leadership skills and function effectively as a team member;  (E) demonstrate an understanding of legal and ethical responsibilities in relation to the field of IT;  (F) demonstrate planning and time-management skills such as project management, including initiating, planning, executing, monitoring and controlling, and closing a project; and  (G) identify job opportunities and accompanying job duties and tasks.  (B) research careers of personal interest along with the education, job skills, and experience required to achieve personal career goals;  (C) demonstrate an understanding of the functions of resumes and portfolios; and  (D) create a digital portfolio. | |
| **Unit 2: Ethics and Security in Programming**  Student will engage in opportunities to develop skills in ethical procedures in programming. Students will participate in group activities to enhance intellectual property law, copyright, trademarks, patents and violation of these laws. Students will discuss security needs for personal identity protection and security in programming data. | 10 periods  450 minutes | (2) The student differentiates the concepts of integrity and confidentiality as related to technology in the business environment. The student is expected to:  (A) define business ethics;  (B) distinguish between honest and dishonest business practices;  (C) examine copyright and licensing issues in the software industry; and  (D) analyze the effects of unethical practices on a business.  (7) The student recognizes issues and complies with procedures for maintaining the security of computerized information. The student is expected to:  (A) identify risks to information systems facilities, data communications systems, and applications;  (B) comply with federal and state legislation pertaining to computer crime, fraud, and abuse;  (C) identify and select controls for information systems facilities, data communications, and applications appropriate to specific risks; and  (D) apply procedures used to recover from situations such as system failure and computer virus. | |
| **Unit 3: Program Concept Consulting, Research and Project Management**  Students will engage in opportunities to develop skills and knowledge in consulting and project management. Students will synthesize and demonstrate knowledge by utilizing hands-on skills activities that will enhance the skills designing a program for a specific client need. Students will gather information, design and develop the framework for a program. | 30 periods  1350 minutes | (3) The student identifies and analyzes the client project software needs and requirements. The student is expected to:  (A) gather data to identify client and project requirements;  (B) identify input and output requirements;  (C) identify system processing requirements; and  (D) develop program requirements and specifications.  (4) The student develops an IT-based project plan to solve a specific problem. The student is expected to:  (A) define scope of work to meet client-based project needs;  (B) identify software development processes and issues; and  (C) explain the software system life cycle approach. | |
| **Unit 4: Fundamentals of Programming Design and Logic**  Students will engage in opportunities to develop software skills in computer programming. Students will synthesize and demonstrate knowledge by utilizing hands-on skills activities that will enhance the use of programming while focusing on projects to apply theories of logic and algorithms into the framework of a program. Students will create flow charts to create programming concepts. | 45 periods  2025 minutes | (5) The student designs a software application plan. The student is expected to:  (A) articulate the principles of system design such as procedural, object-oriented, and event-driven processes;  (B) perform a logical design using appropriate software tools;  (C) apply algorithmic and data structure concepts;  (D) identify constraints;  (E) identify modular design concepts; and  (F) document the design specification using a defined procedure. | |
| **Unit 5: Fundamentals of Programming Code**  Students will engage in opportunities to develop software skills in computer programming. Students will synthesize and demonstrate knowledge by utilizing hands-on skills activities that will enhance the use of programming while focusing on applying programming language code to meet the desired result of the design. Students will compile working computer programing with varying level of requirements from linear search, binary search, array List class, and graphics. | 80 periods  3600 minutes | (6) The student solves problems using different types and levels of programming languages and quality assurances. The student is expected to:  (A) differentiate among the concepts of data such as procedural, object-oriented, and event-driven representation;  (B) identify current programming languages and the environment in which each is used;  (C) produce procedural and object-oriented programs using structured coding with appropriate style and clarity of expression;  (D) demonstrate skill in program testing;  (E) compare computed results with anticipated results to determine the reasonableness of the solutions;  (F) troubleshoot technological problems;  (G) explain the software quality assurance process; and  (H) follow established quality assurance procedures for testing, identifying problems, and tracking resolutions. | |