Approved Innovative Course

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Texas Education Agency

Course: Introduction to C# Programming Applications
PEIMS Code: N1302812
Abbreviation: INTCPA
Grade Level(s): 11-12
Number of Credits: 1.0

Course description:

Introduction to C# Programming Applications is a study of C# syntax including data types, control structures, functions, syntax and semantics of language, classes, class relations and exception handling.

Essential knowledge and skills:

(a) General requirements. This course is recommended for students in Grades 11-12. Recommended prerequisites: Algebra I and Geometry. Students shall be awarded one credit for successful completion of this course.

(b) Introduction.

(1) Career and technical education instruction provides content aligned with challenging academic standards and relevant technical knowledge and skills for students to further their education and succeed in current or emerging professions.

(2) The Information Technology (IT) Career Cluster focuses on building linkages in IT occupations for entry level, technical, and professional careers related to the design, development, support, and management of hardware, software, multimedia, and systems integration services.

(3) In Introduction to C# Programming, students will acquire knowledge of C# syntax including data types, control structures, functions, syntax and semantics of language, classes, class relations, and exception handling. 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.

(4) Students are encouraged to participate in extended learning experiences such as career and technical student organizations and other leadership or extracurricular

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organizations.

(5) Statements that contain the word "including" reference content that must be mastered, while those containing the phrase "such as" are intended as possible illustrative examples.

(c) Knowledge and skills

(1) The student demonstrates professional standards/employability skills as required by the computer programming industry. The student is expected to:

  (A) express ideas in clear, concise and effective manner;

  (B) exhibit the ability to cooperate, contribute, and collaborate as a team member of a team;

  (C) employ effective reading and writing skills;

  (D) employ effective verbal and nonverbal communication skills;

  (E) solve problems and think critically;

  (F) demonstrate leadership skills and function effectively as a team member;

  (G) identify and implement proper safety procedures;

  (H) describe environmental issues related to the field of information technology (IT);

  (I) explain and discuss the relevance of diversity in society and the workplace;

  (J) explain legal and ethical responsibilities in relation to the field of IT; and

  (K) demonstrate planning and time-management skills such as project management.

(2) The student identifies various employment opportunities in the information technology field. The student is expected to:

  (A) identify job opportunities and accompanying job duties and tasks;

  (B) research emerging and innovative technologies that are potential career opportunities;

  (C) research careers of personal interest along with the education, job skills, and experience required to achieve personal career goals; and

  (D) describe the functions of resumes and portfolios.

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(3)   The student identifies basic concepts and defines terminology associated with computer systems and program development. The student is expected to:

(A)   identify and describe appropriate terminology, such as C# terms, syntax, data types, objects, concepts, purposes, control structures, exceptions, classes, and arrays;

(B)   identify and describe various software applications;

(C)   compare the various ways that computers and programming languages are used for personal, workgroup, and enterprise computing;

(D)   identifies and describes multiple logic structures used in software design;

(E)   explain the hardware and software aspects of computer systems that support application software development; and

(F)   identify the fundamental principles of programming, including those of algorithm analysis, software design, operating systems, and database.

(4)   The student demonstrates the use of software development tools and applies problem-solving skills to implement software design. The student is expected to:

(A)   explain the general problem-solving concepts and steps used in software design;

(B)   apply C# terms, syntax, data types, objects, concepts, purposes, control structures, exceptions, classes, and arrays to software design;

(C)   demonstrate the use of procedural programming structure;

(D)   apply advanced object-oriented programming concepts;

(E)   demonstrate the use of arrays in solving problems;

(F)   apply sequential logic structure in software design; and

(G)   apply data structures and algorithms in software design.

(5)   The student develops and writes documented C# programs including designing, debugging and analyzing code. The student is expected to:

(A)   demonstrate the use of studio development tools;

(B)   choose appropriate data/control structures based on assigned criteria;

(C)   demonstrates the use of loops and case logic structures;

(D)   apply file and database concepts;

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(E)   apply the basic techniques of procedural and object oriented programming;

(F)   design and develop correct executable projects;

(G)   develop C# desktop graphical user interface (GUI) programs;

(H)   create appropriate documentation; and

(I)   demonstrate debugging and exceptions handling.

Description of specific student needs this course is designed to meet:

C# was developed to be used for building applications and is designed to be simple and easy to use. C# is the most widely used programming language for .NET. This course provides in-depth instruction that will allow the students to enter the job market with a work-ready skill upon completion of high school. National employment data (Andrew Hogan and Brian Roberts, "Occupational employment projections to 2024," Monthly Labor Review, U.S. Bureau of Labor Statistics, December 2015) and state workforce data gathered by The Labor Market & Career Information Department (LMCI) of the Texas Workforce Commission, projects high growth for Computer Software Developers and Computer Programmers over the next decade.

Major resources and materials:

Gadis, T. (2017). *Starting out with visual C#. (4th ed.).* Washington, DC: Pearson.

Doyle, B. (2012). *C# programming: From problem analysis to program design.* Boston, MA:Cengage Learning.

Microsoft Visual Studio Professional 2015

Recommended course activities:

Development of C# desktop GUI programs.
Development of C# programs that utilize the .NET Collections Framework.
Application of sequential logic structure.
Design and development of correct executable projects.
Creation of appropriate documentation.
Debugging and analysis of program code.

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Suggested methods for evaluating student outcomes:

Performance on assigned projects and teacher developed assessments will be used to determine the student's success. Students will be evaluated on skill competency, written tests, daily grades and group/individual projects using rubrics.

Teacher qualifications:

Business and Finance: Grades 6-12
Business Education: Grades 6-12
Computer Science: Grades 8-12
Secondary Computer Information Systems: Grades 6-12
Secondary Industrial Arts: Grades 6-12
Secondary Industrial Technology: Grades 6-12
Technology Education: Grades 6-12
Trade and Industrial Education:
       Grades 6-12 with appropriate work approval as identified on the certificate
       Grades 8-12 with appropriate work approval as identified on the certificate
Vocational Trades and Industry with appropriate work approval as identified on the certificate

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Additional information: