



Department of Teaching & Learning
Parent/Student Course Information

Advanced Software and Game Development
(BE 6642)
One Credit, One Year
Grades 11 - 12

Counselors are available to assist parents and students with course selections and career planning. Parents may arrange to meet with the counselor by calling the school's guidance department.

COURSE DESCRIPTION

You can play a game on Xbox or on your phone, but can you actually “create a game” for them? Software and Game Development serves as an introduction for students interested in learning fundamental programming concepts, using Game Maker, Visual Studio, C# and the Unity Game Engine. Advanced Software and Game Development students are introduced to Database programming, Mobil App development and advanced programming concepts using Java. End of course projects have included games created in Unity Game Engine, Unreal Game Engine, games using the Oculus Rift and programming the TCC Planetarium. Students will prepare for the National Occupational Competency Testing Institute (NOCTI) assessment in Computer Programming in the first year. During the second year, they will take the Microsoft Office Specialist Access Certification and be eligible to sit for the AP Computer Science Exam.

CERTIFICATION

Students will prepare for and be eligible to sit for the AP Computer Science Exam.

STUDENT ORGANIZATION

The Future Business Leaders of America (FBLA) is the co-curricular organization for secondary Business and Information Technology students. The organization enhances occupational preparation for students by helping them attain the following goals: leadership skills; knowledge of the American enterprise system; self-confidence; improvement of home, business, and community; scholarship; citizenship; and career goals.

PREREQUISITE

Software and Game Development

OPTIONS FOR NEXT COURSE

None

REQUIRED STUDENT TEXTBOOK

None

COMPETENCIES FOR ADVANCED SOFTWARE AND GAME DEVELOPMENT

Demonstrating Workplace Readiness Skills: Personal Qualities and People Skills

- 001 Demonstrate positive work ethic.
- 002 Demonstrate integrity.
- 003 Demonstrate teamwork skills.
- 004 Demonstrate self-representation skills.
- 005 Demonstrate diversity awareness.
- 006 Demonstrate conflict-resolution skills.
- 007 Demonstrate creativity and resourcefulness.

Demonstrating Workplace Readiness Skills: Professional Knowledge and Skills

- 008 Demonstrate effective speaking and listening skills.
- 009 Demonstrate effective reading and writing skills.
- 010 Demonstrate critical-thinking and problem-solving skills.
- 011 Demonstrate healthy behaviors and safety skills.
- 012 Demonstrate an understanding of workplace organizations, systems and climates.
- 013 Demonstrate lifelong-learning skills.
- 014 Demonstrate job-acquisition and advancement skills.
- 015 Demonstrate time-, task- and resource-management skills.
- 016 Demonstrate job-specific mathematics skills.
- 017 Demonstrate customer-service skills.

Demonstrating Workplace Readiness Skills: Technology Knowledge and Skills

- 018 Demonstrate proficiency with technologies common to a specific occupation.
- 019 Demonstrate information technology skills.
- 020 Demonstrate an understanding of Internet use and security issues.
- 021 Demonstrate telecommunications skills.

Examining All Aspects of an Industry

- 022 Examine aspects of planning within an industry/organization.
- 023 Examine aspects of management within an industry/organization.
- 024 Examine aspects of financial responsibility within an industry/organization.
- 025 Examine technical and production skills required of workers within an industry/organization.
- 026 Examine principles of technology that underlie an industry/organization.
- 027 Examine labor issues related to an industry/organization.
- 028 Examine community issues related to an industry/organization.
- 029 Examine health, safety and environmental issues related to an industry/organization.

Addressing Elements of Student Life

- 030 Identify the purposes and goals of the student organization.
- 031 Explain the benefits and responsibilities of membership in the student organization as a student and in professional/civic organizations as an adult.
- 032 Demonstrate leadership skills through participation in student organization activities, such as meetings, programs and projects.
- 033 Identify Internet safety issues and procedures for complying with acceptable use standards.

Developing Object-Oriented Programming (OOP)

- 034 Explain the reasoning behind the steps in the software development life cycle (SDLC).
- 035 Describe object-oriented programming (OOP) and related concepts.
- 036 Identify potential objects, attributes and methods within a problem description.

- 037 Design attributes (properties) and methods of each class within a problem description.
- 038 Create a program with user-defined classes.
- 039 Describe the concept of reusability.
- 040 Identify reusable resources that will help solve a problem.
- 041 Import code from existing sources.
- 042 Describe the concepts of overloading and overriding methods in an object-oriented language.
- 043 Code a program that uses looping structures, conditional structures and sequential control structures.
- 044 Analyze abstract data structures.
- 045 Implement an abstract data structure in a high-level language, including sorting and searching.
- 046 Code a program that uses error-handling and input-validation procedures.
- 047 Code a program to interfaces, relying on abstraction and polymorphism.
- 048 Create a test suite that will verify proper operation of a class or group of related classes.
- 049 Perform a peer review and test of an application.

Developing Database Applications

- 050 Identify relational database terminology.
- 051 Identify database model types.
- 052 Describe the three-layer/tier model for database applications.
- 053 Design a graphical user interface (GUI) for a database application.
- 054 Write code to integrate an existing database into a program application.
- 055 Write code to manage a database.
- 056 Identify the data object model for the program language.
- 057 Bind database fields to the interface elements (controls).
- 058 Code sort and search routines.

Developing Interactive Multimedia Applications

- 059 Integrate multimedia into applications.
- 060 Integrate sound effects and/or background music into applications.
- 061 Identify programming languages and game engines used to create game applications.
- 062 Write a design document for a game.
- 063 Code a 2-D game.
- 064 Create a multiplayer game.
- 065 Create an animated character, using a graphic or sprite editor.
- 066 Write code to track lives and/or energy in a game application.
- 067 Code behaviors of an object within the context of a game.
- 068 Write code to track player score(s).
- 069 Code a 3-D game.

Developing Mobile Applications

- 070 Determine the programming languages used to create mobile applications.
- 071 Design a graphical user interface (GUI) for a mobile application.
- 072 Code an application for a smart device or emulator.
- 073 Describe the process of application deployment.

Developing Web Applications

- 074 Identify programming languages used to create Web applications.
- 075 Describe the Web application publishing process.
- 076 Design a graphical user interface (GUI) for a Web application.
- 077 Code a Web application (e.g., shopping cart).
- 078 Develop a client-side application.
- 079 Develop a server-side application.

080 Design a Web application with security features.

Preparing for Industry Certification

- 081 Describe the process and requirements for obtaining industry certifications related to the Programming, Advanced course.
- 082 Identify testing skills/strategies for a certification examination.
- 083 Demonstrate ability to successfully complete selected practice examinations (e.g., practice questions similar to those on certification exams).
- 084 Successfully complete an industry certification examination representative of skills learned in this course (e.g., MCP, IC3, NOCTI).

Developing Employability Skills

- 085 Investigate continuing education pathways and careers in the information technology industry.
- 086 Create a technical résumé.
- 087 Update professional portfolio.
- 088 Deliver an oral presentation of programming projects.

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For further information please call (757) 263-1070.

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To seek resolution of grievances resulting from alleged discrimination or to report violations of these policies, please contact the Title VI/Title IX Coordinator/Director of Student Leadership at (757) 263-2020, 1413 Laskin Road, Virginia Beach, Virginia, 23451 (for student complaints) or the Section 504/ADA Coordinator/Chief Human Resources Officer at (757) 263-1133, 2512 George Mason Drive, Municipal Center, Building 6, Virginia Beach, Virginia, 23456 (for employees or other citizens). Concerns about the application of Section 504 of the Rehabilitation Act should be addressed to the Section 504 Coordinator/ Executive Director of Student Support Services at (757) 263-1980, 2512 George Mason Drive, Virginia Beach, Virginia, 23456 or the Section 504 Coordinator at the student's school. For students who are eligible or suspected of being eligible for special education or related services under IDEA, please contact the Office of Programs for Exceptional Children at (757) 263-2400, Laskin Road Annex, 1413 Laskin Road, Virginia Beach, Virginia, 23451.

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