Syllabus

I. General Course Information
Course Code: 05370 AA
Course Title: Software Engineering 1 S2
Department: Career & Technical Education (CTE)
School Level: High School
Grade Level: 10, 11, 12
Primary Credit Type: Academic Elective
Prerequisites: Introduction to Computer Magnet
Duration: 2 Semesters
Credits per Duration: 5
Maximum Duration: 2 Semesters
Grading: DPS Standard

II. Course Description
This course introduces students to the basics of game design and computer programming. **GameMaker**, **Visual Basic.net** and **Flash Action Script** will be used to teach programming basics. All students will create an interactive program for use via the internet and design and build their own software project. Completion of both semesters with a grade of "C" or better qualifies the student for concurrent enrollment credit for CSC126 – Game Design and Development at Arapahoe Community College.

III. Course Outline
Course content will include, but is not limited to:

Personal & Project Management
- Introduce and practice techniques for individual and team planning.
- Use of a *Project Management Worksheet* to organize individual and group projects.
- Use Inspiration software as a tool to aid brainstorming and organization.

Software Engineering Basics
- Basics of using the Windows operating system.
- Programming terms and definitions.
- Programming basics – including organization and documentation.
- Programming basics: forms, controls, properties, events, data types, and variables.
- Using GameMaker software to program a basic game.
- Testing programs and pinpointing the causes of errors.

Programming with Game Maker
- Game Maker interface and basics: sprite, object, room.
- Introduction to the Game Maker programming language, creating basic programs.
- Sprite creation – static and animated sprites.
- Use Fireworks to create animated GIF's.

- Object programming: respond to events, move, use multiple sprites.
- Other events: create, step, collision, draw, keyboard response.
- Variables, scoring, health, lives.
- Program documentation.
- Executable files.

Programming with Visual Basic.net

- Visual Basic interface.
- Program organization and documentation.
- Introduction to the Visual Basic programming language.
- Designing and creating Visual Basic programs.
- Forms, controls, and properties.
- Events and code.
- Data types.
- Variables.
- Loops and decisions statements in VB.

Programming with Flash ActionScript

- Flash terminology and the Flash interface.
- Flash movies, creating movie clips.
- ActionScript basics: symbol names, instance names, events.
- Functions in ActionScript.
- Loops and decisions statements.
- Embedding code in symbols.
- Dynamic creation and removal of movie clips.
- Using ActionScript help features.

Software Project

- Brainstorm project ideas.
- Pick a project and define requirements.
- Choose a programming language appropriate to build the project.
- Build the project.
- Present project to the class.

General Concepts and Software

- Word processing using Word.
- Using Inspiration to organize ideas.
- Editing graphics and creating animations.
- Student blog using Wordpress.

IV. Standards and Assessments Coding

CTE Content Standard

ITCO**.06** Know and understand the importance of IT project management concepts, tools and techniques and the role teams play in the IT field.

ITCO**.06.01** Explain the definition of a project and the tools required to establish the project.

ITCO**.06.01.b** Explain the project plan and its components.

ITCO**.06.01.c** Demonstrate the knowledge of project planning methodologies and tools.

ITIM**.02** Understand and demonstrate the use of software and hardware for digital communication production, development and project management.

ITIM**.02.01** Demonstrate the ability to work with appropriate software tools.

ITIM**.02.01.a** Demonstrate proficiency in the use of digital imaging tools, digital video techniques, and equipment. (i.e. bitmapped image editing, vector based editing, layers, channels, masks, etc).

ITIM**.02.01.c** Demonstrate knowledge of available project management and collaborative tools.

ITIM**.02.01.d** Demonstrate knowledge of integrated development environments (such as Visual Studio, Dreamweaver, Flash, Waterproof, etc.)

ITPR**.01** Identify and analyze customer software needs and requirements to guide programming and software development.

ITPR**.01.02** Conduct requirements analysis.

ITPR**.01.02.c** Define the issue or opportunity to be solved by the application.

ITPR**.02** Design a software application using the software development process to deliver a product to the customer.

ITPR**.02.01** Utilize software development processes and methodology.

ITPR**.02.01.a** Demonstrate Problem analysis for a given software problem.

ITPR**.02.01.c** Identify roles of team members/customers in the software development process.

ITPR**.02.02** Create design specifications of a computer application.

ITPR**.02.02.a** Design a software application that meets the requirements of the given problem.

ITPR**.02.02.c** Demonstrate the use of current design tools in the design process.

ITPR**.03** Produce (code) a computer application to demonstrate proficiency in developing an application using the appropriate programming language.

ITPR**.03.01** Demonstrate proficiency of programming language concepts.

ITPR**.03.01.c** Demonstrate knowledge of the basic principles for analyzing a programming program.

ITPR**.03.01.d** Demonstrate knowledge of the basics of structured or object-oriented language.

ITPR**.03.02** Demonstrate proficiency in developing an application using an appropriate programming language.

ITPR**.03.02.a** Demonstrate knowledge of current key programming languages and the Interactive Development Environment (IDE) they are used in.

ITPR**.03.02.b** Translate data structure and program design into code in an appropriate language.

ITPR**.03.02.c** Demonstrate knowledge of key constructs and commands specific to a language.

ITPR**.03.02.e** Prepare code documentation.

Postsecondary & Workforce Readiness and Essential Skills

ESSK**.02** Communications: Use oral and written communication skills in creating, expressing, and interpreting information and ideas including technical terminology and information.

ESSK**.02.01** Select and employ appropriate reading and communication strategies to learn and use technical concepts and vocabulary in practice.

ESSK**.02.01.f** Communicate information, data, and observations to apply information learned from reading to actual practice.

ESSK**.02.05** Use correct grammar, punctuation, and terminology to write and edit documents.

ESSK**.02.05.a** Compose multi-paragraph documents clearly, succinctly, and accurately.

ESSK**.02.05.c** Use correct grammar, spelling, punctuation, and capitalization when preparing written documents.

Academic Alignment with Math, Science, Reading, Writing and Communication (CCSS, CAS)

MA10-GR.HS-S.1-GLE.2-EO.a.i Use units as a way to understand problems and to guide the solution of multi-step problems. (CCSS:N-Q.1) 1. Choose and interpret units consistently in formulas. (CCSS: N-Q.1) 2. Choose and interpret the scale and the origin in graphs and data displays.

RWC10-GR.12-S.3-GLE.2-EO.d Select and build context for language appropriate to content (technical, formal)

RWC10-GR.11-S.3-GLE.3-EO.c Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. (Grade-specific expectations for writing types are defined in expectations 1-2 above.) (CCSS: W.11-12.4)

RWC10-GR.11-S.3-GLE.3-EO.b Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing. (CCSS: L.11-12.2), i. Observe hyphenation conventions. (CCSS: L.11-12.2a), ii. Spell correctly. (CCSS: L.11-12.2b)

V. Additional Course Information

Fees: Set by the school
Materials: Set by the school
Textbooks: Set by the school
Resources: Teacher website at www.fornstrom.tjcomputermagnet.com

VI. Final Notes

Completion of both semesters with a grade of "C" or better qualifies the student for concurrent enrollment credit for CSC126 – Game Design and Development at Arapahoe Community College.