Syllabus

I. General Course Information
Course Code: 05371 AA & 05352 or 01907 (if Concurrent Enrollment)
Course Title: Software Engineering 2 S1 & S2
Department: Career & Technical Education (CTE)
School Level: High School
Grade Level: 10, 11, 12
Primary Credit Type: Academic Elective
Prerequisites: Software Engineering 1 S2
Duration: 2 Semesters
Credits per Duration: 5
Maximum Duration: N/A
Grading: DPS Standard

II. Course Description
Introduces computer program design using concepts of structured programming and logic. Includes pseudocode, flowcharts, and structure charts. Covers variables, data types, control structures, looping, program breaks, and arrays. Completion of both semesters with a grade of "C" or better qualifies the student for concurrent enrollment credit for CSC119 – Introduction to Programming at Arapahoe Community College.

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

General Concepts and Software
- Word processing using Word.
- Using Inspiration to organize ideas.
- Student blog using Wordpress.

Program Design
- Problem definition
- Program design
- Document program flow using pseudocode
- Task definition and scheduling

Program Implementation
- Identify activities that can be implemented using computer programs.
- Implementation techniques – object-based development, top-down development
- Programming constructs – declarations, input and output, control
- Generic data types and functions

Program Analysis

- Testing
- Debugging
- Understanding and modifying existing code
- Handling errors
- Analysis of algorithms

Computer Programming Skills

- Identify different types of variables, and know when to use each type
- Control program flow using decision making
- Apply looping to a program
- Use arrays in a program

Software Development Tools & Programming Languages (not all languages will be taught every year)

- Adobe Flash ActionScript
- Adobe Photoshop, Fireworks or other graphics tool
- Microsoft Visual Studio C#
- Java development using Eclipse
- Android program development
- Other tools as needed

Math Concepts used in Flash Programs

- Coordinate planes
- Movement on a coordinate plane
- Range and domain of data points
- Slope
- Gravity
- Acceleration and deceleration
- Equilateral triangles
- Radians and degrees
- Rotation
- Linear functions
- Exponential functions

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.a** Define a project as it relates to the IT field.

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.b** Demonstrate knowledge of available graphics, video, motion graphics, web software programs.

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.b** Analyze and prepare logic using pseudocode and/or program flowchart.

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.2-GLE.2-EO.a Construct and compare linear, quadratic, and exponential models and solve problems. (CCSS: F-LE)

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 CSC116 – Program Logic and Design at Arapahoe Community College.