EVERETT PUBLIC SCHOOLS
INTRODUCTION TO COMPUTER PROGRAMMING I and II

Course: INTRODUCTION TO COMPUTER PROGRAMMING I and II		**Total Framework Hours:** 180
CIP Code: 110701	☒Exploratory ☐Preparatory	**Date Last Modified:** 08.2022
Career Cluster: Information Technology		**Cluster Pathway:** Programming and software development

Industry Recognized Certificates:
List possible certificates students can earn in the course

Work-Based Learning:
- Guest Speakers from industry
- School – Based Enterprise

COMPONENTS AND ASSESSMENTS
Performance Assessments: • Students will use the properties of shapes to answer 15 multiple choice questions, one free response question and complete a creative task that uses at least 10 components.
Leadership Alignment: • 2.C.4 Interpret information and draw conclusions based on the best analysis • 4.A.2. Evaluate information critically and competently • 6.A.1. Use technology as a tool to research, organize, evaluate and communicate information
Standards and Competencies
Unit: Creating Drawings
Industry Standards and/or Competencies — **Total Learning Hours for Unit:** 10
3A-AP-17. Decompose problems into smaller components through systematic analysis, using constructs such as procedures, modules, and/or objects 3A.-AP-21. Evaluate and refine computational artifacts to make them more usable and accessible.
Aligned Washington State Learning Standards

Educational Technology	1.a. Articulate and set personal learning goals, develop strategies leveraging technology to achieve them and reflect on the learning process itself to improve learning outcomes. 4.c. Develop, test and refine prototypes as part of a cyclical design process
Mathematics	HST.MG.A.1 Use geometric shapes, their measures, and their properties to describe objects (e.g., modeling a tree trunk or a human torso as a cylinder).

COMPONENTS AND ASSESSMENTS

Performance Assessments:

- Students will use function, mouse events and properties to answer 15 multiple choice questions, one free response questions and complete a creative task that uses at least one function they create.

Leadership Alignment:

- 1.B.2. Be open and responsive to new and diverse perspectives; incorporate group input and feedback into the work
- 2.C.3. Synthesize and make connections between information and arguments
- 7.B.1. Incorporate feedback effectively

Standards and Competencies

Unit: Functions, Mouse Events, and Properties

Industry Standards and/or Competencies	**Total Learning Hours for Unit:** 10

3A-CS-03. Develop guidelines that convey systematic troubleshooting strategies that others can use to identify and fix errors.

3A-AP-14. Use lists to simplify solutions, generalizing computational problems instead of repeatedly using simple variables.

3A-AP-14. Create artifacts by using procedures within a program, combinations of data and procedures, or independent but interrelated programs

3S-AP-23. Document design decisions using text, graphics, presentations, and/or demonstrations in the development of complex programs

Aligned Washington State Learning Standards

Educational Technology	1.a. Articulate and set personal learning goals, develop strategies leveraging technology to achieve them and reflect on the learning process itself to improve learning outcomes 4.c. Develop, test and refine prototypes as part of a cyclical design process 6.d. Publish or present content that customizes the message and medium for their intended audiences.

COMPONENTS AND ASSESSMENTS

Performance Assessments:

- Students will use mouse motion events, conditionals and helper functions answer 15 multiple choice questions, one free response questions and complete a creative task that uses at least two conditionals.

Leadership Alignment:

- 4.B.1 Use information accurately and creatively for the issue or problem at hand
- 5.B.1. Understand and utilize the most appropriate media creation tools, characteristics and conventions
- 8.A.3. Utilize time and manage workload efficiently

Standards and Competencies

Unit: Mouse Motion Events, Conditionals and Helper Functions

Industry Standards and/or Competencies	**Total Learning Hours for Unit:** 15

3A-CS-03. Develop guidelines that convey systematic troubleshooting strategies that others can use to identify and fix errors

3A-AP-13 Create prototypes that use algorithms to solve computational problems by leveraging prior student knowledge and personal interests.

3A-IC-27 Use tools and methods for collaboration on a project to increase connectivity of people in different cultures and career fields

Aligned Washington State Learning Standards

Educational Technology	1.c. Use technology to seek feedback that informs and improves their practice and to demonstrate their learning in a variety of ways. 4.a. Know and use a deliberate design process for generating ideas, testing theories, creating innovative artifacts or solving authentic problems.

	6.d. Publish or present content that customizes the message and medium for their intended audiences.

COMPONENTS AND ASSESSMENTS	
Performance Assessments: • Students will use conditionals and methods to answer 15 multiple choice questions, one free response questions and complete a creative task that uses at least two conditionals with a key press.	
Leadership Alignment: • 7.A.2. Work effectively in a climate of ambiguity and changing priorities • 10.A.2. Prioritize, plan and manage work to achieve the intended result • 11.A.1. Use interpersonal and problem-solving skills to influence and guide others toward a goal	
Standards and Competencies	
Unit: More Conditionals, Key Events, and Methods	
Industry Standards and/or Competencies	**Total Learning Hours for Unit:** 15
3A-DA-12 Create computational models that represent the relationships among different elements of data collected from a phenomenon or process. 3A-AP-19 Systematically design and develop programs for broad audiences by incorporating feedback from users. 3A-IC-26 Demonstrate ways a given algorithm applies to problems across disciplines.	
Aligned Washington State Learning Standards	
Educational Technology	1.c. Use technology to seek feedback that informs and improves their practice and to demonstrate their learning in a variety of ways. 4.a. Know and use a deliberate design process for generating ideas, testing theories, creating innovative artifacts or solving authentic problems. 6.d. Publish or present content that customizes the message and medium for their intended audiences.

COMPONENTS AND ASSESSMENTS	
Performance Assessments: • Students will use complex conditionals to answer 15 multiple choice questions, one free response questions and complete a creative task that revisits a previous creative task or exercise and makes improvements to utilize new skills learned.	
Leadership Alignment: • 3.A.3. Use communication for a range of purposes (e.g. to inform, instruct, motivate and persuade • 7.A.2. Work effectively in a climate of ambiguity and changing priorities • 8.B.1. Monitor, define, prioritize and complete tasks without direct oversight	
Standards and Competencies	
Unit: Complex Conditionals and More Key Events	
Industry Standards and/or Competencies	**Total Learning Hours for Unit:** 15
3A-CS-03 Develop guidelines that convey systematic troubleshooting strategies that others can use to identify and fix errors. 3A-AP-18 Create artifacts by using procedures within a program, combinations of data and procedures, or independent but interrelated programs. 3A-AP-19 Systematically design and develop programs for broad audiences by incorporating feedback from users. 3A-AP-23 Document design decisions using text, graphics, presentations, and/or demonstrations in the development of complex programs.	

Aligned Washington State Learning Standards	
Educational Technology	1.a. Articulate and set personal learning goals, develop strategies leveraging technology to achieve them and reflect on the learning process itself to improve learning outcomes. 4.d. Exhibit a tolerance for ambiguity, perseverance and the capacity to work with open-ended problems. 6.c. Communicate complex ideas clearly and effectively by creating or using a variety of digital objects such as visualizations, models or simulations.

COMPONENTS AND ASSESSMENTS

Performance Assessments:

- Students will use the groups (lists) to answer 15 multiple choice questions, one free response questions and complete a creative task which uses a group (list) and a group (list) method.

Leadership Alignment:

- 3.B.2. Exercise flexibility and willingness to be helpful in making necessary compromises to accomplish a common goal
- 7.B.3. Understand, negotiate and balance diverse views and beliefs to reach workable solutions, particularly in multi-cultural environments
- 8.C.2. Demonstrate initiative to advance skill levels towards a professional level

Standards and Competencies

Unit: Groups, Step Events, and Motion

Industry Standards and/or Competencies	**Total Learning Hours for Unit:** 15

3A-CS-14 Develop guidelines that convey systematic troubleshooting strategies that others can use to identify and fix errors.

3A-AP-13 Create prototypes that use algorithms to solve computational problems by leveraging prior student knowledge and personal interests.

3A-AP-14 Use lists to simplify solutions, generalizing computational problems instead of repeatedly using simple variables.

3A-AP-18 Create artifacts by using procedures within a program, combinations of data and procedures, or independent but interrelated programs.

Aligned Washington State Learning Standards	
Educational Technology	1.a. Articulate and set personal learning goals, develop strategies leveraging technology to achieve them and reflect on the learning process itself to improve learning outcomes. 4.a. Know and use a deliberate design process for generating ideas, testing theories, creating innovative artifacts or solving authentic problems. 5.c. Break problems into component parts, extract key information, and develop descriptive models to understand complex systems or facilitate problem-solving. 6.b. Create original works or responsibly repurpose or remix digital resources into new creations.

COMPONENTS AND ASSESSMENTS

Performance Assessments:

- Students will use variable, random variables and for loops to answer 15 multiple choice questions, one free response questions and complete a creative task which uses a for loop

Leadership Alignment:

- 4.A.1. Access information efficiently (time) and effectively (sources)
- 7.B.1. Incorporate feedback effectively
- 8.A.3. Utilize time and manage workload efficiently

Standards and Competencies

Unit: Local Variables, For Loops and Random Variables	
Industry Standards and/or Competencies	**Total Learning Hours for Unit:** 15
3A-DA-12. Create computational models that represent the relationships among different elements of data collected from a phenomenon or process. 3A-AP-14 Use lists to simplify solutions, generalizing computational problems instead of repeatedly using simple variables. 3A-AP-21 Evaluate and refine computational artifacts to make them more usable and accessible.	
Aligned Washington State Learning Standards	
Educational Technology	1.c. Use technology to seek feedback that informs and improves their practice and to demonstrate their learning in a variety of ways. 4.c. Develop, test and refine prototypes as part of a cyclical design process 6.d. Publish or present content that customizes the message and medium for their intended audiences.

COMPONENTS AND ASSESSMENTS
Performance Assessments: • Students will use math functions and nested loops to answer 15 multiple choice questions, one free response questions and complete a creative task which uses a randomly generated number and math operators.
Leadership Alignment: • 1.A.3. Elaborate, refine, analyze and evaluate their own ideas in order to improve and maximize creative efforts • 6.A.1. Use technology as a tool to research, organize, evaluate and communicate information • 10.A.2. Prioritize, plan and manage work to achieve the intended result

Standards and Competencies	
Unit: Math Functions, Random Values and Nested Loops	
Industry Standards and/or Competencies	**Total Learning Hours for Unit:** 15
3A-DA-12 Create computational models that represent the relationships among different elements of data collected from a phenomenon or process 3A-AP-18 Create artifacts by using procedures within a program, combinations of data and procedures, or independent but interrelated programs. 3A-AP-23 Document design decisions using text, graphics, presentations, and/or demonstrations in the development of complex programs.	
Aligned Washington State Learning Standards	
Educational Technology	4.a. Know and use a deliberate design process for generating ideas, testing theories, creating innovative artifacts or solving authentic problems 6.b. Create original works or responsibly repurpose or remix digital resources into new creations.

COMPONENTS AND ASSESSMENTS
Performance Assessments: • Students will use while loops and strings to answer 15 multiple choice questions, one free response questions and complete a creative task which uses a while loop.
Leadership Alignment: • 1.A.3. Elaborate, refine, analyze and evaluate their own ideas in order to improve and maximize creative efforts • 2.B.1. Analyze how parts of a whole interact with each other to produce overall outcomes in complex systems • 8.A.1. Set goals with tangible and intangible success criteria

Standards and Competencies	
Unit: Strings and While Loops	
Industry Standards and/or Competencies	**Total Learning Hours for Unit:**15
3A-DA-12. Create computational models that represent the relationships among different elements of data collected from a phenomenon or process. 3A-AP-14. Use lists to simplify solutions, generalizing computational problems instead of repeatedly using simple variables. 3A-AP-23. Document design decisions using text, graphics, presentations, and/or demonstrations in the development of complex programs.	
Aligned Washington State Learning Standards	
Educational Technology	1.c. Use technology to seek feedback that informs and improves their practice and to demonstrate their learning in a variety of ways. 5.c. Break problems into component parts, extract key information, and develop descriptive models to understand complex systems or facilitate problem-solving. 6.d. Publish or present content that customizes the message and medium for their intended audiences.

COMPONENTS AND ASSESSMENTS
Performance Assessments: • Students will use the lists to answer 15 multiple choice questions, one free response questions and complete a creative task which utilizes a list.
Leadership Alignment: • 2.B.1. Analyze how parts of a whole interact with each other to produce overall outcomes in complex systems • 3.A.5. Communicate effectively in diverse environments (including multi-lingual) • 8.A.3. Utilize time and manage workload efficiently

Standards and Competencies	
Unit: Lists and Return Values	
Industry Standards and/or Competencies	**Total Learning Hours for Unit:** 15
3A-CS-03 Develop guidelines that convey systematic troubleshooting strategies that others can use to identify and fix errors. 3A-DA-12 Create computational models that represent the relationships among different elements of data collected from a phenomenon or process. 3A-AP-17 Decompose problems into smaller components through systematic analysis, using constructs such as procedures, modules, and/or objects.	
Aligned Washington State Learning Standards	
Educational Technology	1.c. Use technology to seek feedback that informs and improves their practice and to demonstrate their learning in a variety of ways. 4.c. Develop, test and refine prototypes as part of a cyclical design process. 5.c. Break problems into component parts, extract key information, and develop descriptive models to understand complex system or facilitate problem-solving.

COMPONENTS AND ASSESSMENTS
Performance Assessments: • Students will use the two-dimensional lists (matrix) to answer 15 multiple choice questions, one free response questions and complete a creative task which utilizes a two-dimensional list (matrix).
Leadership Alignment: • 2.B.1. Analyze how parts of a whole interact with each other to produce overall outcomes in complex systems

- 3.A.5. Communicate effectively in diverse environments (including multi-lingual)
- 8.A.3. Utilize time and manage workload efficiently

Standards and Competencies

Unit: 2D Lists and Board Games

Industry Standards and/or Competencies	**Total Learning Hours for Unit:** 15

3A-A-12. Create computational models that represent the relationships among different elements of data collected from a phenomenon or process.

3A-AP-13. Create prototypes that use algorithms to solve computational problems by leveraging prior student knowledge and personal interests.

3A-AP-19 Systematically design and develop programs for broad audiences by incorporating feedback from users.

3A-AP-22 Design and develop computational artifacts working in team roles using collaborative tools.

Aligned Washington State Learning Standards

Educational Technology	1.a. Articulate and set personal learning goals, develop strategies leveraging technology to achieve them and reflect on the learning process itself to improve learning outcomes. 4.c. Develop, test and refine prototypes as part of a cyclical design process. 5.c. Break problems into component parts, extract key information, and develop descriptive models to understand complex systems or facilitate problem-solving. 6.c. Communicate complex ideas clearly and effectively by creating or using a variety of digital objects such as visualizations, models or simulations.

COMPONENTS AND ASSESSMENTS

Performance Assessments:

- Students will create an artifact using the design process (vision, pseudocode, debugging, etc)
- Students present (written, verbal, etc) the critical decisions made throughout the project.
- Students may work individually or in a group.

Leadership Alignment:

- 1.A.3. Elaborate, refine, analyze and evaluate their own ideas in order to improve and maximize creative efforts
- 1.B.3. Demonstrate originality and inventiveness in work and understand the real-world limits to adopting new ideas
- 8.C.2. Demonstrate initiative to advance skill levels towards a professional level

Standards and Competencies

Unit: Creative Project with Images and Sounds

Industry Standards and/or Competencies	**Total Learning Hours for Unit:** 20

3A-CS-03 Develop guidelines that convey systematic troubleshooting strategies that others can use to identify and fix errors.

3A-DA-12 Create computational models that represent the relationships among different elements of data collected from a phenomenon or process

3A-AP-18 Create artifacts by using procedures within a program, combinations of data and procedures, or independent but interrelated programs.

3A-AP-22. Design and develop computational artifacts working in team roles using collaborative tools

3A-AP-23. Document design decisions using text, graphics, presentations, and/or demonstrations in the development of complex programs

3A-IC-27. Use tools and methods for collaboration on a project to increase connectivity of people in different cultures and career fields

Aligned Washington State Learning Standards

Educational Technology	3A-CS-03 Develop guidelines that convey systematic troubleshooting strategies that others can use to identify and fix errors.

	3A-DA-12 Create computational models that represent the relationships among different elements of data collected from a phenomenon or process 3A-AP-18 Create artifacts by using procedures within a program, combinations of data and procedures, or independent but interrelated programs. 3A-AP-22. Design and develop computational artifacts working in team roles using collaborative tools 3A-AP-23. Document design decisions using text, graphics, presentations, and/or demonstrations in the development of complex programs 3A-IC-27. Use tools and methods for collaboration on a project to increase connectivity of people in different cultures and career fields

21st Century Skills		
Check those that students will demonstrate in this course:		
LEARNING & INNOVATION **Creativity and Innovation** ☒Think Creatively ☒Work Creatively with Others ☒Implement Innovations **Critical Thinking and Problem Solving** ☒Reason Effectively ☒Use Systems Thinking ☒Make Judgments and Decisions ☒Solve Problems **Communication and Collaboration** ☒Communicate Clearly ☒Collaborate with Others	**INFORMATION, MEDIA & TECHNOLOGY SKILLS** **Information Literacy** ☒Access and /evaluate Information ☒Use and Manage Information **Media Literacy** ☐Analyze Media ☒Create Media Products **Information, Communications and Technology (ICT Literacy)** ☒Apply Technology Effectively	**LIFE & CAREER SKILLS** **Flexibility and Adaptability** ☒Adapt to Change ☒Be Flexible **Initiative and Self-Direction** ☒Manage Goals and Time ☒Work Independently ☒Be Self-Directed Learners **Social and Cross-Cultural** ☒Interact Effectively with Others ☒Work Effectively in Diverse Teams **Productivity and Accountability** ☒Manage Projects ☒Produce Results **Leadership and Responsibility** ☐Guide and Lead Others ☒Be Responsible to Others