Course Title – Computer Programming II

Implement start year – 2015-2016

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Unit # 6 – Computing in Context

Transfer Goal –

Students will be able to independently use their learning to develop code with awareness of the social implications of computing systems necessary for the study of computer science.

Stage 1 – Desired Results

Established Goals

2009 NJCCC Standard(s), Strand(s)/CPI #
(http://www.nj.gov/education/cccs/2009/final.htm)

Common Core Curriculum Standards for Math and English
(http://www.corestandards.org/)

9.4.12.K.66	Employ information management techniques and strategies to assist in decision-making
9.4.12.K.(3).8	Participate in a user-friendly design and development process Web-based and digital communication solution
9.4..12.K.(4).1	Identify and analyze customer software needs and requirements to guide programming and software development
9.4.12.K.(4).2	Create and use information technology strategies and projects plans when solving specific problems to deliver a product that meets customer specifications
9.4.12.K.(4).3	Identify and analyze system and software requirements to ensure maximum operating efficiency

21st Century Themes
(www.21stcenturyskills.org)

_x_ Global Awareness
___ Financial, Economic, Business and Entrepreneurial Literacy
___ Civic Literacy
___ Health Literacy
___ Environmental Literacy

21st Century Skills

Learning and Innovation Skills:
_x_ Creativity and Innovation
_x_ Critical Thinking and Problem Solving
___ Communication and Collaboration

Information, Media and Technology Skills:
_x_ Information Literacy
___ Media Literacy

9.4.12.K.(4).4 Demonstrate the effective use software development tools to develop software applications 9.4.12.K.(4).5 Use the software development process to design a software and deliver it to the customer 9.4.12.K.(4).6 Produce a computer application, in code, to demonstrate proficiency in developing an application using the appropriate programming language	_x_ ICT (Information, Communications and Technology) Literacy *Life and Career Skills:* _x_ Flexibility and Adaptability ___ Initiative and Self-Direction ___ Social and Cross-Cultural Skills _x_ Productivity and Accountability ___ Leadership and Responsibility
Enduring Understandings: *Students will understand that . . .* *EU 1* • software is tested to ensure that specifications have been met, the program is error free and it has system security. *EU 2* • privacy of others must be respected. *EU 3* • software developers never use established work without credit being documented *EU 4* • software must be developed for the betterment of society while reducing negative consequences to human well-being.	**Essential Questions:** *EU 1* • How can software be appropriately tested to check for errors prior to software being presented for distribution? • How is software developed to ensure that it is secure from virtual crime? *EU 2* • How is software used illegally to violate the privacy of others? • Why is it necessary to develop software that protects the privacy rights of others? *EU 3* • How can software be used unethically by programmers? *EU 4* • What are the reasons for developing software that reduces negative consequences to society? • How can developers ensure software has been developed in ways that are beneficial to society?

Knowledge: *Students will know . . .*	**Skills:** *Students will be able to . . .*
EU1 • techniques to test software for errors. • steps to develop software that is secure from virtual crime.	*EU 1* • debug software to test for errors. • discuss the security problems when developing software.
EU 2 • that software is used illegally to violate the privacy of others.	EU 2 • explain how software is used illegally and how it violates the privacy of others.
EU 3 • methods in which software is used unethically. • program development must ensure that intellectual property rights are not violated in software development.	EU 3 • describe methods in which software is used unethically. • recognize and fully credit other people's work. • use their own ideas to develop software.
EU 4 • why software is developed for the betterment of society which reduces negative consequences to human well-being. • steps to prevent software from being used in ways which are detrimental to society.	EU 4 • explain why software must be developed to enhance society. • develop programs to contribute to society and human well-being. • safeguard software from use in ways which are detrimental to society.

Stage 2 – Assessment Evidence

Recommended Performance Tasks: *Each unit must have at least 1 Performance Task. Consider the GRASPS form.*

Other Recommended Evidence: *Tests, Quizzes, Prompts, Self-assessment, Observations, Dialogues, etc.*

- Review situations to determine the software has been developed using ethical practices, pointing out potential violations
- Testing of developed software to create an error-free program
- Writing prompts regarding the improper use of computer software
- Quizzes on ethics in software development and methods to ensure that software is used for the betterment of society
- Unit test

Stage 3 – Learning Plan

Suggested Learning Activities to Include Differentiated Instruction and Interdisciplinary Connections:

- Research and present situations in which software was misused in criminal ways (A)
- Research and discuss the Code of Ethics and Profession Conduct in computer programming (A)
- Design a program that tabulates a student's GPA, using grades and credit hours for each class for which a student is enrolled (M,T)
- Evaluate the programs of peers to confirm the software is free from errors, offering suggestions as errors are detected (M,T)
- Develop a persuasive argument why Americans should or should not be more concerned about cyber-attacks.(A, M, T)

The following is the suggested sequence of learning activities and number of days for the Computer Programming II class. (Approximate number of days 15)

- A programmer is responsible to release a working product
- Professional ethics and Intellectual Property
- Security and the privacy of others
- The impact of cyber-crime on society

Vocabulary

- Virus
- Privacy
- Cookies
- Firewall
- Hacker
- Spyware
- Morality
- Ethics
- Copyright
- Intellectual Property
- Identify Theft
- Malware