

# Software Development

## Course Description:

Course Code: 270705

## Endorsements to Teach:

IT, Math

## Programs of Study to which this Course applies:

Software Development

CIS. HS. 9. 1

### Recognize and define computational problems.

CIS. HS. 9. 1. k Employ user-centered research techniques to investigate the needs of a user population.

CIS. HS. 9. 1. l Identify and design multiple potential computational solutions to a given problem and evaluate their tradeoffs, including stakeholder feedback.

CIS. HS. 9. 1. m Describe how parallel processing can be used to solve large problems (e.g., SETI at Home, FoldIt, map-reduce).

CIS. HS. 9. 1. n Discuss issues that arise when breaking large-scale problems down into parts that must be processed simultaneously on separate systems (e.g., cloud computing, parallelization, concurrency).

CIS. HS. 9. 2

### Develop and use abstractions in computational artifacts.

CIS. HS. 9. 2. q Design and evaluate the components of computational solution to an identified problem.

CIS. HS. 9. 2. r Use functional decomposition techniques to develop the framework for a computational solution.

CIS. HS. 9. 2. s Find things to reuse from elsewhere.

CIS. HS. 9. 3

### Create computational artifacts.

CIS. HS. 9. 3. n Apply knowledge of computational tools and programming language to select components needed to implement a solution for a user audience.

CIS. HS. 9. 3. o Justify the choice of selected computational tools with respect to user needs and contextual constraints.

CIS. HS. 9. 5

### Test and iteratively refine computational solutions.

CIS. HS. 9. 5. h Evaluate program using debugging techniques and unit testing to ensure correctness of code.

CIS. HS. 9. 5. i Engage with stakeholders to evaluate the usability, functionality, and user experience.

CIS. HS. 9. 5. j Using empirical evidence, prioritize additional features and defects that should be addressed in subsequent development cycles.

CIS. HS. 9. 6

### Explore social and ethical impacts of computing.

CIS. HS. 9. 6. m Identify potential threats or unintended consequences of a student-created software solution.

CIS. HS. 9. 6. n Justify how the current version of the student solution guards against external threats, malicious uses, or unintended consequences.

CIS. HS. 9. 6. o Compare and contrast various software licensing schemes (e.g., open source, freeware, commercial).

CIS. HS. 9. 6. p For a particular computational artifact, justify an appropriate software licensing scheme.

CIS. HS. 9. 7

### Collaborate to create computational artifacts.

CIS. HS. 9. 7. f Use version control systems and collaboration tools in a group software project to manage resources.

CIS. HS. 9. 7. g Define the components and structure of a standard software lifecycle process (e.g., waterfall, spiral, agile).

CIS. HS. 9. 7. h Demonstrate software life cycle processes (e.g., spiral, waterfall) by participating on software project teams (e.g., community service project with real-world clients).

CIS. HS. 9. 8

### Communicate about their computational artifacts and computational understandings.

CIS. HS. 9. 8. j Communicate results and processes to stakeholders.

CIS. HS. 9. 8. k Provide justifications for design decisions and the effect they will have on final product.

CIS. HS. 9. 8. l Present periodic updates on development process to classmates and other stakeholders.

CIS. HS. 9. 8. m Develop a summative presentation to describe the software solution, development process, intended use, and future development plans.