

PROGRAM-SPECIFIC COMPETENCIES - COMPUTER SCIENCE

Competencies are the skills, knowledge and attributes gained through every work, educational, volunteer and life experience.

UVic students in the [Computer Science](#) program develop the following program-specific competencies. We worked with the Department of Computer Science to develop this document.

NETWORKS, HARDWARE AND COMMUNICATIONS

Understands computer networking principles and engineering

- + Understands layered network architecture
- + Uses different digital communication networks to transmit data
- + Works with LANs and WANs
- + Applies different network protocols at different layers
- + Protects networks from unauthorized access using the appropriate policies in conjunction with the underlying computer network infrastructure
- + Identifies mobile wireless communications techniques and issues affecting multimedia quality of service
- + Implements different types of buses, interrupts, families of processors and instruction sets

SOFTWARE DEVELOPMENT, PRACTICE AND THEORY

Employs knowledge of software life cycles and developmental phases

- + Works within the different software development lifecycle stages
- + Takes business, product and process requirements into consideration
- + Applies different software development methodologies
- + Implements process improvement models, such as ISO 9000
- + Solves software development problems using formal methods
- + Considers software evolution issues during development

COMPUTER HARDWARE AND SYSTEMS

Demonstrates knowledge of the architecture of computer systems and the interrelationship between the OS and the architecture

- + Utilizes the necessary tools to improve system performance
- + Understands the transfer of information from one system component to another
- + Compares performance of similar systems using common metrics
- + Identifies the optimal system for given problem
- + Works with different CPU architectures
- + Uses different operating systems
- + Utilizes different memory management methods

COMPUTER INFORMATION PROCESSING AND ALGORITHMS

Understands the theoretical foundations of computer science and the practice of abstracting known methods to new problems

- + Designs automated software test tools
- + Displays an ability to manipulate information
- + Creates solutions from user specifications, given known system constraints
- + Optimizes solutions to improve performance using coding best practices
- + Acknowledges the practical limits of a system for problem solving