

# INFORMATION TECHNOLOGY

## D. Programming and Systems Development Career Pathway

D1.0 Students understand the strategies necessary to define and analyze system and software requirements.

BENCHMARKS	COURSE TITLES				
D1.1 Develop IT-based strategies and project plans to solve specific problems.					
D1.2 Know how system and software requirements are determined in various situations.					
D1.3 Know the effective use of tools for software development.					
D1.4 Know the software development process.					

Primary Delivery - **P**  
 Secondary Delivery - **S**

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D2.0 Students understand programming languages.

BENCHMARKS	COURSE TITLES				
D2.1 Know fundamentals of programming languages and concepts.					
D2.2 Compare programs using control structures, procedures, functions, parameters, variables, error recovery, and recursion.					
D2.3 Understand digital logic, machine-level representation of data, memory system organization, and architecture use of assembly-level programming.					

Primary Delivery - **P**  
Secondary Delivery - **S**

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D3.0 Students understand the creation and design of a software program.

BENCHMARKS	COURSE TITLES				
D3.1 Analyze customer software needs and requirements.					
D3.2 Know how specifications and code are developed for new and existing software applications.					
D3.3 Understand the abstract organization of information and how programs maintain the properties of the data structure while performing operations such as search, insert, or load-balancing.					
D3.4 Know multiple ways of storing and retrieving/accessing information.					
D3.5 Understand how to track software versions.					

Primary Delivery - **P**  
 Secondary Delivery - **S**

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D4.0 Students understand the process of testing, debugging, and maintaining programs to meet specifications.

BENCHMARKS	COURSE TITLES				
D4.1 Know the steps involved in the software testing process.					
D4.2 Know program maintenance methodologies to preserve intended program applications and operational scheduled batch and real-time jobs.					
D4.3 Know how different systems and associated utilities perform functions such as file management, backup and recovery, and execution of programs.					
D4.4 Understand the differences between simple and multi-user operating systems.					

Primary Delivery - **P**  
 Secondary Delivery - **S**

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D5.0 Students understand the importance of quality assurance tasks

BENCHMARKS	COURSE TITLES				
D5.1 Know the standards/requirements for software quality assurance.					
D5.2 Know common quality assurance tasks and their place in the development process.					
D5.3 Understand ways in which specification changes and technological advances can require the modification of programs.					
D5.4 Know various sorting and searching methods and their comparative advantages.					
D5.5 Know the characteristics of reliable, effective, and efficient products.					

Primary Delivery - **P**  
 Secondary Delivery - **S**

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D6.0 Students understand the importance of effective interfaces in the interaction between humans and computer systems.

BENCHMARKS	COURSE TITLES				
D6.1 Understand how to support access, privacy, and high ethical standards in computing.					
D6.2 Use knowledge of cognitive, physical, and social interactions to create and design user-friendly computer practices and applications that meet the needs of the market.					

Primary Delivery - **P**  
Secondary Delivery - **S**