

PROGRAMMING AND SOFTWARE DEVELOPMENT

Programming and Software Development prepares students for careers related to hardware and software programming and analysis. Students develop proficiency in designing, developing, testing, documenting, implementing, and maintaining computer systems and software. Students have an opportunity to work with computer operating systems, programming languages, software development, applications, and computer maintenance. Skills acquired will assist students to obtain industry certifications. Essential skill areas include but are not limited to:

Computer Systems Architecture
 Programming Analysis
 Software Design
 Application/Operating System Programming

Database Development & Administration
 Web Design Utilization
 Computer Application Development &
 Implementation

Sample Career Options:

Entry-Level Programmer
 Database Software Technician
 Database Developer/Administrator
 Operating Systems Specialist
 Programmer/Analyst

Senior-Level Programmer
 Software/Application Support
 Software Designer
 Systems Analyst
 Tester

Related Certifications/Certificates:

Brainbench Java Fundamentals Certificate
 Brainbench Java 2 Certification
 Brainbench Software Development Certifications
 CIW Associate (ProSoft Training)
 CIW Professional (ProSoft Training)
 CIW Developer (ProSoft Training)
 IC3
 International Computer Driving License
 Java Programming Certificate (CISCO)
 Microsoft Certified Professional (MCP)
 Oracle Certified Professional
 Sun Certified Programmer for Java2 Platform

***Note: See complete listing of approved certifications in CTE Administrative Planning Guide**

PROGRAM SEQUENCES

Grades 9-10 (36-week course): Information Technology Fundamentals

Specializations (Grades 11-12):

BUS6640 Programming
 BUS6641 Advanced Programming

BUS6660 Database Management & Administration
 BUS6661 Advanced Database Management Administration

SKILL SETS

Programming/Software Engineering	Database Development and Administration
<ul style="list-style-type: none"> • Write software (designed to run in batch mode at specified intervals, interactively so it is available whenever a user chooses, or in real time for intelligent devices like sensors or switches that operate all the time) • Translate business and scientific problems into codes a computer can understand • Create an architecture to: <ul style="list-style-type: none"> - map out how the system should perform - specify customer requirements - create designs that move ideas and words into system capabilities and functions - write programs in one of many different languages, and test work at various levels of granularity to assure that it runs bug free and solves the problem it was intended to solve 	<ul style="list-style-type: none"> • Needs analysis • Database design • Database design and modeling • User interface development • Object creation and related implementation activity • Monitoring and testing • Security and maintenance <p>The demands placed on a database can be very dynamic, subject to change as the organization’s needs change. Database developers may work on the most mission critical of company information systems or the next generation in peer-to-peer or data mining applications.</p>

Employability Skills for the IT Industry	
<ul style="list-style-type: none"> • Project Management Skills • Interpersonal Skills • Analytical Skills • The ability to monitor and correct one’s own performance • Oral and written communication skills 	<ul style="list-style-type: none"> • The ability to select proper equipment and tools, apply technology to specific tasks, and maintain/troubleshoot equipment • Loyalty to the organization and commitment to finishing assignments and projects

Adapted from the Following Sources:

- IT Pathway Pipeline Model: Rethinking Information Technology Learning in Schools, Educational Development Center, Inc. and Information Technology Association of America.
- Cluster Concentrations/Pathways: The Ohio Information Technology Competency Profile.
- When Can You Start? Building Better Information Technology Skills and Careers, Information Technology Association of America, 2001.
- IT Career Cluster Initiative: Reinventing IT Education for Learning and Working, Educational Development Center, Inc.