**Test Type:** The Computer Programming industry-based credential is included in NOCTI’s Job Ready assessment battery. Job Ready assessments measure technical skills at the occupational level and include items which gauge factual and theoretical knowledge. Job Ready assessments typically offer both a written and performance component and can be used at the secondary and post-secondary levels. Job Ready assessments can be delivered in an online or paper/pencil format.

**Revision Team:** The assessment content is based on input from secondary, post-secondary, and business/industry representatives from the states of California, Connecticut, and Pennsylvania.

**CIP Code:**

11.0201- Computer Programming/Programmer, General

15-1131.00- Computer Programmers

**Career Cluster:**

11- Information Technology

The Association for Career and Technical Education (ACTE), the leading professional organization for career and technical educators, commends all students who participate in career and technical education programs and choose to validate their educational attainment through rigorous technical assessments. In taking this assessment you demonstrate to your school, your parents and guardians, your future employers and yourself that you understand the concepts and knowledge needed to succeed in the workplace. Good Luck!
NOCTI written assessments consist of questions to measure an individual’s factual theoretical knowledge.

**Administration Time:** 3 hours  
**Number of Questions:** 166  
**Number of Sessions:** This assessment may be administered in one, two, or three sessions.

### Areas Covered

- Analyze Programming Problems and Flowchart Solutions: 15%  
- Design Program Solutions: 13%  
- Code Programs: 19%  
- Test Programs: 14%  
- Maintain Programs: 7%  
- Complete User Documentation and Technical Writing: 8%  
- General Information and Concepts: 24%
Specific Standards and Competencies Included in this Assessment

Analyze Programming Problems and Flowchart Solutions

- Analyze user requirements for a given outcome
- Determine input and output formats for a program
- Determine the flow of data through network
- Identify and describe a data flow diagram
- Identify and describe a process logic diagram
- Describe the system development cycle (i.e., code management, ongoing revisions)

Design Program Solutions

- Determine where data is to be accessed/stored
- Design data storage and layout
- Apply principles of quality, efficient programming
- Explain the importance of a design review
- Apply implementation plans for a new system
- Assess ongoing impact of existing systems
Specific Standards and Competencies (continued)

**Code Programs**
- Determine the variables and data types for a program
- Prepare and code routines using structured logic
- Identify various programming languages
- Apply appropriate computer language syntax
- Explain unit testing requirements
- Document appropriate comments and programmer notes

**Test Programs**
- Explain system testing requirements
- Design and analyze test plan for use in program testing
- Test programs and evaluate results for accuracy
- Correct programming errors discovered during testing
- Identify appropriate debugging tools

(Continued on the following page)
Specific Standards and Competencies (continued)

**Maintain Programs**
- Change existing programs when requirements change
- Correct existing program errors
- Update documentation for existing programs
- Provide user instructions on program modifications

**Complete User Documentation and Technical Writing**
- Develop documentation narrative
- Define data use and storage
- Develop online help for users

**General Information and Concepts**
- Apply general design and programming concepts
- Identify various hardware platforms and run-time environments
- Identify human aspects in information systems
- Identify general information technology (IT) definitions and terms
- Adhere to best programming practices and methodologies
- Exhibit understanding of data hierarchy, access methods, and manipulation
Sample Questions

Data that is represented in a tagged-format language is
A. delimited
B. fixed-length
C. XML
D. binary

Large programs used by many different people should be stored on a
A. server
B. personal computer
C. DVD drive
D. tape backup

Each module in top-down programming should
A. be well distributed
B. represent a loop
C. represent a program function
D. contain a procedure call

Test data should be developed that will
A. execute the program properly the first time
B. validate the operating system
C. contain only invalid data
D. generate the answers wanted by users

Documentation standards should be
A. changed frequently
B. defined up front
C. dictated by the end users
D. determined by the programmer

(Continued on the following page)
Sample Questions (continued)

The requirements, design, implementation, and testing phases are part of the
A. programming phase sequence
B. software development life cycle
C. extreme programming development
D. linear design phase

A structured code walk-through
A. ensures that the code follows in-house standards
B. ensures that there are sufficient lines of code
C. increases the user friendliness of the program
D. should only be performed by the original programmer

Compile errors can be caused by bad syntax, typing errors, or
A. input data
B. incorrect user specification
C. illegal function calls
D. insufficient test data

One technique for handling runtime errors gracefully to prevent the application
from crashing is to
A. make use of exception handling
B. use an interpreter not a compiler
C. limit user input and output
D. compile the code a second time

The process of laying out a web page on poster board is called
A. outlining
B. storyboarding
C. copying
D. processing
Performance Assessment

NOCTI performance assessments allow individuals to demonstrate their acquired skills by completing actual jobs using the tools, materials, machines, and equipment related to the technical area.

Administration Time: 3 hours  
Number of Jobs: 2

Areas Covered:

61% Write a Program  
Participants will use correct information and date for customer orders for Susan Smith, Reshay Thompson, and George Jackson, get cumulative information, label columns, enter data accurately, and set up output form correctly.

39% Design Solution Logic  
Participants will read input file until End of File, list name and date of birth, count the number of people, calculate the age of each person, calculate the average age of the group, produce a summary line, and produce a hard copy of the logic flow diagram.
Sample Job

**Design Solution Logic**

**Maximum Time:** 30 minutes

**Participant Activity:** The participant will be provided a programming situation. Create a flowchart or pseudocode that solves the programming situation (problem definition).