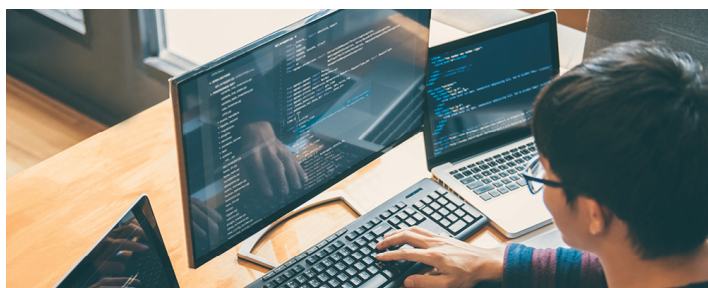


# INFORMATION TECHNOLOGY– PROGRAMMING AND DEVELOPMENT WITH A CONCENTRATION IN QUALITY ASSURANCE, ASSOCIATE OF APPLIED BUSINESS



The Programming and Development degree with a concentration in Quality Assurance prepares students for entry level positions in software programming and testing. This degree helps students gain theoretical knowledge and practical experience with software programming and testing. Students develop competencies in designing, implementing, integrating and maintaining software systems using a variety of languages and technologies.

The concentration in Quality assurance also prepares students to create and execute various types of test plans and write automation scripts according to the software requirements, execute the test plans with various test data and document/report defects. Students will be able to get recognition for testing as an essential and professional software engineering specialization.

Skills acquired will assist students in preparing to take industry certification exams.

**Program contact:** Learn more

Learn more about how certificate credits apply to the related degree and about related training programs.

## Related Degrees and Certificates

- Mobile Application Development, Short-Term Certificate
- Web Application Development, Short-Term Certificate
- .NET Programming, Post-Degree Professional Certificate
- Information Technology, Programming and Development, Associate Degree
- Information Technology, Programming and Development, Post-Degree Professional Certificate

## Related Training and Credentials

- Cleveland Codes Tri-C Software Developers Academy

- High School Diploma/GED not required, but highly recommended
- ENG-0995 Applied College Literacies or appropriate score on English Placement Test.

### Program Learning Outcomes

This program is designed to prepare students to demonstrate the following learning outcomes:

1. Communicate effectively utilizing verbal, written and presentation skills to interview and educate stakeholders.
2. Explain and implement technologies that are impacted by legal and ethical issues.
3. Adapt to change within their profession by demonstrating a commitment to continuous research and learning.
4. Apply knowledge of organizational structures, models, processes, procedures, rules and distribution of power and authority in order to function as an effective IT resource that meets organizational goals.
5. Apply knowledge of programming (application, web, data and security) at the enterprise level and use industry standards, guidelines and use appropriate tools to gather requirements, develop, test and quality assure organizational information technology business systems (new and existing). Work as part of a development team using industry standards and guidelines.
6. Develop a test plan using the scientific method that meets user acceptance criteria based on existing code and allows plans to be repeatable (i.e. performance, user acceptance, regression).
7. Create an automated test for an API/Web Service and a User Interface (UI) that sets up and tears down the test environment and can automate the execution of features and functions of the software solution to determine if the actual output is the anticipated output and ensure product success.
8. Triage an issue using debugging skills in both physical and virtualized environments to examine a system, look at the four major resources (processor, memory, disk I/O, network) to determine where problem is occurring (Machine connections, software, user, etc) and to provide information to the responsible party (i.e. developer, product owner).
9. Write a well-formed query to extract data, set up data, or analyze data in a test environment. (SQL Server)
10. Perform testing on software including API/Web service, Web, Desktop, and Mobile. (Response Web Design)
11. Define and apply various test design methodologies to appropriate testing scenarios.
12. Recognize the various tools that are available to use to script for various tasks, including testing, automation, compiling, extracting, and analyzing data for work efficiency.
13. Create documentation of system defects with sufficient detail and advocating for correction to meet customer needs.
14. Use knowledge of how testing integrates with software development team in a diverse team environment with professionalism, integrity and accountability.

MATH-1140, MATH-1141, MATH-1200, MATH-1270, and MATH-1280 can no longer count towards fulfilling the college-level mathematics requirement. These courses were re-classified as developmental mathematics by the state of Ohio in 2016. Tri-C established a 5-year transition window for students who had completed these courses prior to 2016 to apply them towards meeting graduation requirements, which expired in Summer 2021. It is highly recommended to see a

counselor to determine the appropriate math required for your current major.

## Suggested Semester Sequence

| First Semester                                |   | Credit Hours |
|---|---|--------------|
| BADM-1020                                     | Introduction to Business                        | 3            |
| IT-1025                                       | Information Technology Concepts for Programmers | 3            |
| IT-1050                                       | Programming Logic                               | 3            |
| Select one of the following:                  |   | 3            |
| ENG-1010                                      | College Composition I                           |              |
| ENG-101H                                      | Honors College Composition I                    |              |
| Select one of the following:                  |   | 3            |
| COMM-1010                                     | Fundamentals of Speech Communication            |              |
| COMM-101H                                     | Honors Speech Communication                     |              |
| Credit Hours                                  |   | 15           |
| Second Semester                               |   | Credit Hours |
| IT-1150                                       | Introduction to Web Programming                 | 3            |
| IT-2650                                       | Java Programming                                | 4            |
| MATH-1XXXX                                    | 1000-Level MATH course or higher                | 3            |
| IT-1200                                       | Introduction to Software Quality Assurance      | 4            |
| Select one of the following:                  |   | 3            |
| BADM-2010                                     | Business Communications                         |              |
| BADM-201H                                     | Honors Business Communications                  |              |
| Credit Hours                                  |   | 17           |
| Summer Session                                |   | Credit Hours |
| Select one of the following:                  |   | 1-3          |
| IT-2830                                       | Cooperative Field Experience                    |              |
| ITNT-2300                                     | Networking Fundamentals                         |              |
| Credit Hours                                  |   | 1-3          |
| Third Semester                                |   | Credit Hours |
| IT-2351                                       | Enterprise Database Systems                     | 4            |
| IT-2200                                       | Software Quality Assurance Techniques           | 4            |
| Social and Behavioral Science/Natural Science |   | 3            |
| ITXX-XXXX                                     | Programming Elective                            | 3-4          |
| Credit Hours                                  |   | 14-15        |
| Fourth Semester                               |   | Credit Hours |
| IT-2030                                       | ASP.NET Web Programming                         | 4            |
| IT-2500                                       | Software Testing Automation                     | 4            |
| Select one of the following:                  |   | 3            |
| PHIL-2020                                     | Ethics  |              |
| PHIL-202H                                     | Honors Ethics                                   |              |
| Select one of the following:                  |   | 3            |
| BADM-1301                                     | Small Business Management                       |              |
| ACCT-1311                                     | Financial Accounting                            |              |
| Credit Hours                                  |   | 14           |
| Total Credit Hours                            |   | 61-64        |

## PROGRAMMING ELECTIVES

Select from the following courses to fulfill the programming elective requirement. Courses cannot be used for both a requirement and elective (in the case of an "or" selection above):

| Code      | Title   | Credit Hours |
|-----------|---|--------------|
| IT-2080   | Data Visualization  | 4            |
| IT-2090   | Data Analytics Programming  | 4            |
| IT-2100   | iOS Application Programming   | 4            |
| IT-2110   | Android Mobile Application Development                                  | 3            |
| ITNT-2300 | Networking Fundamentals   | 3            |
| IT-2600   | E-Business Programming Technologies                                     | 3            |
| IT-2670   | C/C++ Programming Language  | 4            |
| IT-2680   | Visual C# .NET  | 4            |
| IT-2740   | Fundamentals of Client Operating Systems and Hardware for Cybersecurity | 4            |
| IT-2750   | Scripting Fundamentals for Cybersecurity                                | 3            |