

## WTCS Repository

# Program Design

50-152-1 IT-SOFTWARE DEVELOPER APPRENTICE

Description

Software Developers develop, create, and modify general computer applications software or specialized utility programs. Analyze user needs and develop software solutions. Design software or customize software for client use with the aim of optimizing operational efficiency. May analyze and design databases within an application area, working individually or coordinating database development as part of a team.

External Requirements

APPRENTICESHIP TRAINING STANDARDS

2-year apprenticeship under the hybrid model (both time-based and competency-based)

Total of 4035 hours

360 hours of paid related instruction

Complete Transition to Trainer course in the final year

Entry Requirements

Registered Wisconsin Apprentice

External Standards

|  |  |
| --- | --- |
| Title | IT: Software Developer DACUM |
| Sponsoring Organization | DWD-BAS, WTCS |

### Program Outcomes

|  |  |
| --- | --- |
| 1 | Contribute to software development lifecycle |
| 2 | Complete programming tasks |
| 3 | Troubleshoot problems |
| 4 | Perform developer testing |
| 5 | Maintain version control |
| 6 | Package and deploy applications |
| 7 | Develop professionally |
| 8 | Create documentation |

## 50-152-1 IT: Software Developer Apprentice Related Instruction Model [2017-18]

Description

This program configuration represents a statewide model for class cohorts in the related instruction portion of the IT: Software Developer apprenticeship. The model outlines related instruction for 2 years (terms). It reflects a total of 360 hours of combined related instruction lecture, demonstration, and hands-on learning aligned with DWD-BAS apprenticeship training standards. This model is designed for class meetings front loaded in the first year of the apprenticeship (but not delivered in a block). This model provides foundational skills apprentices will need in on-the-job learning during the 2 years of their apprenticeship.

This model aligns WTCS learning outcomes with relevant industry standards as identified by an industry validated DACUM and Exhibit A work processes approved by the state trade committee. Supporting documentation may be found in the BAS IT: Software DeveloperJob Book.

This curriculum model may be interpreted and implemented by the colleges as required to meet local needs and in support of local work processes by the steering committee and DWD-BAS.

Credits

|  |  |
| --- | --- |
| Total Credits | 10 |

## Term 1

|  |  |  |
| --- | --- | --- |
| Course # | Course Title | Credits |
| 50-152-701 | Basic Programming for IT: Software Apprentices | 3 |

## Term 2

|  |  |  |
| --- | --- | --- |
| Course # | Course Title | Credits |
| 50-152-702 | Collaborative Application Development | 2 |

## Term 3

|  |  |  |
| --- | --- | --- |
| Course # | Course Title | Credits |
| 50-152-703 | Intermediate Programming for IT: Software Apprentices | 2 |

## Term 4

|  |  |  |
| --- | --- | --- |
| Course # | Course Title | Credits |
| 50-152-704 | Advanced Programming for IT: Software Apprentices | 3 |
| 47-455-455 | Transition to Trainer: Your Role as a Journey Worker |  |

### Program Course List

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Number | Title | Credits | Description | Pre/Corequisites |
| 50-152-701 | Basic Programming for IT: Software Apprentices | 3 | Provides an introduction to software developer skills.  Focuses on the use of an integrated development environment and managing code in a repository.  Apprentices use logic, function, basic collections, object oriented concepts, and programming concepts to build and debug an application.    Learning Plans developed by WTCS faculty with support of WTCS State Leadership funds during the 2018-19 academic year. | Wisconsin Registered Apprentice |
| 50-152-702 | Collaborative Application Development | 2 | Explores the software development life cycle and the functional requirements used to create a successful application using a collaborative approach. Provides apprentices the opportunity to develop skills in presenting and demonstrating software to internal and external stakeholders. Emphasis is placed on clear and concise delivery.  Apprentices also examine online developer resources and interpret technical information. | 50-152-701 Basic Programming for IT: Software Apprentices |
| 50-152-703 | Intermediate Programming for IT: Software Apprentices | 2 | Focuses on intermediate programming skills for apprentices. Apprentices create a code branch, resolve merge conflicts and utilize file storage. Emphasis is placed on object oriented programming principles. | 50-152-702 Software Development Life Cycle 50-152-701 Basic Programming for IT: Software Apprentices |
| 50-152-704 | Advanced Programming for IT: Software Apprentices | 3 | Examines advanced programming skills for apprentices.  Focus is placed on design patterns, algorithms, data structures, and delegates.  Apprentices utilize a database with an application. | 50-152-703 Intermediate Programming for IT: Software Apprentices |
| 47-455-455 | Transition to Trainer: Your Role as a Journey Worker |  | Apprenticeship training is a collaborative partnership: employer and employee associations, government, and educational institutions each play a part. In reality, most learning takes place through the daily interaction between an apprentice and his/her co-workers. Surveys have shown that the apprentices are least satisfied with the on-the-job portion of their training--particularly the ability of journey level workers and supervisors to pass on their knowledge of the trade.   You have already learned to use the tools of your chosen trade. In this workshop you will be introduced to a new set of basic tools--the tools of a jobsite trainer. You will explore the skills that are necessary to be an effective trainer, discover how to deliver hands-on training, and examine the process for giving useful feedback. During the workshop you will build a Training Toolkit to take back to your work on the job. |  |

50-152-701 Basic Programming for IT: Software Apprentices

# Course Outcome Summary

### Course Information

|  |  |  |
| --- | --- | --- |
|  | Description | Provides an introduction to software developer skills.  Focuses on the use of an integrated development environment and managing code in a repository.  Apprentices use logic, function, basic collections, object-oriented concepts, and programming concepts to build and debug an application.    Learning Plans developed by WTCS faculty with support of WTCS State Leadership funds during the 2018-19 academic year. |
|  | Instructional Level | Technical Diploma |
|  | Total Credits | 3 |
|  | Total Hours | 108 |

Pre/Corequisites

|  |  |
| --- | --- |
| Prerequisite | Wisconsin Registered Apprentice |

### Course Competencies

|  |  |
| --- | --- |
| 1. | Use an integrated development environment (IDE) |
| 2. | Manage code within a repository |
| 3. | Relate critical thinking and problem solving to software development |
| 4. | Demonstrate the use of logic |
| 5. | Demonstrate the use of functions |
| 6. | Demonstrate the use of basic collections |
| 7. | Define basic object-oriented programming (OOP) concepts |
| 8. | Apply programming concepts to build an application |
| 9. | Debug an application |
| 10. | Implement object oriented programming (OOP) concepts |

50-152-702 Collaborative Application Development

# Course Outcome Summary

### Course Information

|  |  |  |
| --- | --- | --- |
|  | Description | Explores the software development life cycle and the functional requirements used to create a successful application using a collaborative approach. Provides apprentices the opportunity to develop skills in presenting and demonstrating software to internal and external stakeholders. Emphasis is placed on clear and concise delivery.  Apprentices also examine online developer resources and interpret technical information. |
|  | Instructional Level | Technical Diploma |
|  | Total Credits | 2 |
|  | Total Hours | 72 |

Pre/Corequisites

|  |  |
| --- | --- |
| Prerequisite | 50-152-701 Basic Programming for IT: Software Apprentices |

### Course Competencies

|  |  |
| --- | --- |
| 1. | Illustrate the systems development lifecycle |
| 2. | Interpret functional requirements to create a design |
| 3. | Demonstrate software functionality to internal groups |
| 4. | Demonstrate software functionality to stakeholders |
| 5. | Interpret technical documentation |
| 6. | Use online developer resources |
| 7. | Create a professional development plan |

50-152-703 Intermediate Programming for IT: Software Apprentices

# Course Outcome Summary

### Course Information

|  |  |  |
| --- | --- | --- |
|  | Description | Focuses on intermediate programming skills for apprentices. Apprentices create a code branch, resolve merge conflicts and utilize file storage. Emphasis is placed on object oriented programming principles. |
|  | Instructional Level | Technical Diploma |
|  | Total Credits | 2 |
|  | Total Hours | 72 |

Pre/Corequisites

|  |  |
| --- | --- |
| Prerequisite | 50-152-702 Software Development Life Cycle |
| Prerequisite | 50-152-701 Basic Programming for IT: Software Apprentices |

### Course Competencies

|  |  |
| --- | --- |
| 1. | Create a code branch |
| 2. | Resolve merge conflicts |
| 3. | Define basic object-oriented programming (OOP) principles |
| 4. | Implement object-oriented programming (OOP) principles |
| 5. | Utilize file storage for applications |
| 6. | Implement event-driven programming |
| 7. | Implement unit tests |

50-152-704 Advanced Programming for IT: Software Apprentices

# Course Outcome Summary

### Course Information

|  |  |  |
| --- | --- | --- |
|  | Description | Examines advanced programming skills for apprentices.  Focus is placed on design patterns, algorithms, data structures, and delegates.  Apprentices utilize a database with an application. |
|  | Instructional Level | Technical Diploma |
|  | Total Credits | 3 |
|  | Total Hours | 108 |

Pre/Corequisites

|  |  |
| --- | --- |
| Prerequisite | 50-152-703 Intermediate Programming for IT: Software Apprentices |

### Course Competencies

|  |  |
| --- | --- |
| 1. | Utilize a database with an application |
| 2. | Define design patterns |
| 3. | Apply design patterns to the application |
| 4. | Utilize delegates |
| 5. | Explore algorithms and data structures |

47-455-455 Transition to Trainer: Your Role as a Journey Worker

# Course Outcome Summary

### Course Information

|  |  |  |
| --- | --- | --- |
|  | Description | Apprenticeship training is a collaborative partnership: employer and employee associations, government, and educational institutions each play a part. In reality, most learning takes place through the daily interaction between an apprentice and his/her co-workers. Surveys have shown that the apprentices are least satisfied with the on-the-job portion of their training--particularly the ability of journey level workers and supervisors to pass on their knowledge of the trade.   You have already learned to use the tools of your chosen trade. In this workshop you will be introduced to a new set of basic tools--the tools of a jobsite trainer. You will explore the skills that are necessary to be an effective trainer, discover how to deliver hands-on training, and examine the process for giving useful feedback. During the workshop you will build a Training Toolkit to take back to your work on the job. |
|  | Total Hours | 8 |

### Course Competencies

|  |  |
| --- | --- |
| 1. | Value your role as a journey worker trainer |
| 2. | Serve as a mentor and job coach |
| 3. | Foster a positive work environment by acting as an ally/advocate |
| 4. | Provide hands-on skills training |
| 5. | Provide feedback on apprentice performance |