

VectorCAST/C++ Unit Testing Basic Course

Agenda VectorAcademy

Delivery Format:	This Course is offered in Classroom or Remote Format
Duration:	Classroom: 3 days Remote: 21 hours
Target Group:	Developers, Unit Test team, Integration Test team
Prerequisites:	Knowledge about software development for automotive systems
Goal:	Gain an understanding of using VectorCAST/C++ for Unit Testing and Code Coverage

1. Introduction

- > Terminology
- > Unit test concepts
 - > Basic unit test philosophy
 - > Types of test cases

2. Building Environments

- > Prerequisites
 - > What is required to use VectorCAST/C++
- > Whitebox/Blackbox testing
- > Environment building wizard
 - > Steps to creating a VectorCAST/C++ testing environment
- > Environment configuration
 - > Configure items in VectorCAST Project

3. Creating Test Cases

- > Specifying input & expected values
- > Data types
- > Data entry techniques
- > Compound tests
- > Range and List Expressions

4. Code Coverage

- > Coverage types
- > Coverage usage & options
- > Coverage by Analysis
 - > Augment coverage of hard to reach code
- > MC/DC code coverage
 - > Used in safety critical systems governed by DO-178, ISO 26262, eetc.
 - > Creating test cases based off MC/DC pairs Overview and Introduction

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5. Test Reports

- > Execution reports
 - > Results of test case execution
 - > Coverage reports
 - > Management reports

6. Regression Testing

- > GUI usage only
- > Basic configuration
- > Analytics

7. User Code

- > Types of user code
 - > Parameter user code
 - > Test Case user code
 - > Environment user code
- > User code syntax

8. Stubbing Fundamentals

- > Stub by function
- > Adding/Suppressing stubs
- > Library stubs
- > Controlling stub behavior

9. Testing C++ Classes (C++ Customers only)

- > C++ Harness architecture: class instance objects, member variables, etc.
- > Class instances and constructors

10. Creating Tests from CSV Data

- > Import CSV data to create tests
- > Create import templates

11. Generating Test Cases Using the Vector Test Data Editor (Windows Only)

- > Generate automated test cases using a Classification Tree

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12. System Testing with VectorCAST QA

- > Creating a VectorCAST/QA Environment
 - > Configuring compiler, preprocessor and linker options
 - > Instrumenting source code
- > Automate using Python
 - > Automate building instrumented source and test execution

13. Requirements Gateway

- > Importing requirements
- > Exporting results to ALM/Requirements tools

14. VectorCAST Workflows

- > Establish VectorCAST workflow for unit and system test environments
- > Best practices

15. Probe Points

- > Accessing local statics
- > Testing hard to reach code

16. Troubleshooting Build Process

- > Options affecting build process
- > Troubleshooting techniques in VectorCAST

17. Debugging Test Execution Problems

- > Debugging techniques in VectorCAST
- > Integrating source code debugger with VectorCAST/C++

18. Advanced Troubleshooting Techniques

- > Troubleshooting preprocess, compile and link errors