

Since 2007, Making IT Experts & Products

Embedded Systems Python-Based Test Automation for

Duration: 120 Hrs (Changeable) | Fees: Individual / Batch

Since 2007, Nestsoft TechnoMaster has been providing training, internships, and services in IT technologies, both online and offline, with the expertise of **over 250 industry experts**. We have delivered internships, training, and seminars to more than 50,000 students, resulting in numerous success stories. **We offer 100% placement support through JobsNEAR.in**

Our Courses/Internship

- Python/Django Fullstack
- Artificial Intelligence
- Machine Learning
- Data Science
- Software Testing (All)
- Wordpress, Woocommerce
- Digital Marketing, SEO
- Php/MySQL, Laravel
- Flutter, Android, IOS
- Asp.net MVC
- Web Design, Javascript
- Angular JS, React JS
- CCNA, MCSA, CCNP
- AWS, GCP, Azure
- Odoo, Salesforce, Sap
- Microsoft Excel
- Ethical Hacking



Syllabus on the Next Page ..



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Introduction to Embedded Test Engineering (5 Hours)

- * Introduction to embedded systems and electronics testing
- * Fundamentals of hardware validation and test automation
- * Test engineering workflow and laboratory safety

Python Programming (20 Hours)

- * Python installation and development environment setup
- * Variables, data types, operators, and input/output
- * Conditional statements, loops, and functions
- * Lists, tuples, dictionaries, and sets

Modules, packages, and object-oriented programming

- * File handling, CSV, JSON, and exception handling
- * Regular expressions, logging, and debugging
- * Python scripts for engineering applications

Test Automation Fundamentals (10 Hours)

- * Manual testing versus automated testing
- * Test plans, test cases, and test procedures
- * Functional, regression, and integration testing
- * Test automation architecture and reusable scripts
- * Test data management and result logging
- * Automated test execution and reporting

PyTest Framework (15 Hours)

- * PyTest installation and project structure

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- * Writing test functions and assertions
- * Fixtures and setup/teardown methods
- * Parameterized testing and test data handling
- * Markers, test selection, and grouping
- * Exception testing and mocking basics
- * Test reports and debugging failed tests
- * Regression testing and reusable test suites

PyVISA and Instrument Control (15 Hours)

- * Introduction to VISA and PyVISA
- * Installing PyVISA and configuring backends
- * USB, serial, and LAN instrument communication
- * Discovering instruments and opening connections
- * SCPI commands and instrument programming
- * Controlling digital multimeters and oscilloscopes
- * Automated measurements and data collection
- * Error handling, timeouts, and connection troubleshooting
- * Logging measurement results to CSV files

Embedded C Programming (10 Hours)

- * Embedded C fundamentals and development environments
- * Data types, operators, conditions, and loops
- * Functions, arrays, pointers, and structures
- * Bitwise operations and register-level concepts

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- * Interrupts and memory fundamentals
- * Debugging and embedded coding practices

STM32 Microcontrollers (10 Hours)

- * STM32 architecture and development board introduction
- * STM32CubeIDE and STM32CubeMX basics
- * GPIO configuration and LED control
- * Timers, PWM, and ADC fundamentals
- * UART serial communication
- * Firmware flashing, debugging, and peripheral testing
- * Python-based communication with STM32 devices

KiCad and Altium Designer (8 Hours)

- * Introduction to electronic design automation tools
- * Schematic creation and component libraries
- * Component placement and PCB layout basics
- * Design rule checks and error identification
- * PCB documentation and manufacturing outputs
- * Introduction to design verification

Git and GitHub (5 Hours)

- * Git installation and repository setup
- * Commits, branches, merges, and conflict resolution
- * GitHub repositories and remote collaboration
- * README files and project documentation

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- * Version control for automated test projects

LabVIEW Fundamentals (10 Hours)

- * Introduction to LabVIEW and virtual instruments
- * Front panels and block diagrams
- * Controls, indicators, loops, and case structures
- * Data acquisition and measurement visualization
- * Instrument communication fundamentals
- * Basic test sequence development

AI Tools for Engineering (5 Hours)

- * Introduction to AI tools for engineering workflows
- * AI-assisted Python code generation and debugging
- * Generating test cases and test documentation
- * AI-assisted troubleshooting and technical research
- * Code verification, data privacy, and responsible AI use

Integrated Project and Assessment (7 Hours)

- * Develop a Python and PyTest automated testing framework
- * Integrate PyVISA for instrument communication where hardware is available
- * Perform basic STM32 device testing
- * Record measurements and generate test reports
- * Manage source code using GitHub
- * Final project demonstration and assessment

Course Duration

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- * Total Duration: 120 Hours
- * Recommended Schedule: 10 hours per week for 12 weeks
- * Learning Method: Practical sessions, guided exercises, and project work
- * ...

(Click on Course for more details)

Systems

Course: Python-Based Test Automation for Embedded

Duration: 120 Hrs (Changeable) | Fees: Individual / Batch

- Thank You -

N.B: This syllabus is not final and can be customized as per requirements / updates.

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