



Training course program

Lab Instrument Control Using Python

32 study hours

Begins 3-June 2024

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Introduction:

Interlligent's Lab Instrument Control Using Python equips the participant with the Python programming skills and tools to automate the control of laboratory instruments, specifically signal generators, and spectrum analyzers. It covers Python fundamentals, essential libraries, GUI development, instrument interfacing, complex baseband signals, and culminates in a hands-on workshop where the participant will create a fully automated power amplifier measurement suite and modelling system using Python and real test equipment.

The training combines theoretical studies with practical examples from the industry that clearly demonstrate the studied subjects.

Attendees will receive certified electronic copies of our original training materials which include Theoretical background materials, assignments with their explained solutions and copies of the presentations.

Target audience:

RF Electronics engineers who would like to gain lab automation expertise, and in particular:

- Working in Python- the friendliest and most comprehensive computer language
- Automating measurement processes in the lab
- Testing complex RF scenarios with baseband signals
- Programming small GUI applications for ease of use

Required prior knowledge:

Participants should have a basic understanding of programming concepts and the Python programming language. Additionally, familiarity with foundational RF concepts such as signals, RF power, spectrum analysis, and analyzers is expected. The following courses are recommended for Python beginners:

[Python Programming Beginner to Expert \(Udemy\)](#)

[Python Full Course for Free \(YouTube\)](#)

Presenters:

The course will be presented by [Mr. Nir Tal](#) and [Mr. Dan Wolberg](#), Wireless communication experts with decades of experience in programming, RF labs and equipment.

Program outline:

The course includes 32 study hours comprising 3 frontal course days including lectures and hands-on exercises and a one-day workshop using fully functional test equipment stations implementing a real RF lab test case.

Meetings timetable and curriculum:

Meeting No.	Date	Subject index	Study subject	Study hours
1	Day 1- 3 Jun	1A	Introduction to Python, Pycharm IDE	2
1		1B	Common libraries (e.g. numpy, matplotlib, pandas). Git version control.	4
1		1C	Introduction to Python: exercise: setting up IDE environment, virtual environment, programming exercise	2
2	Day 2- 5 Jun	2A	Yaml files, PyQt5 GUI	3.0
2		2B	Exercise: complex calculator in GUI (basic operations + cartesian to polar)	2.5
2		2C	Interfacing lab instruments via the VISA protocol and demo	2.5
3	Day 3- 17 Jun	3A	Digital complex baseband signals 101	2
3		3B	Complex baseband signals: programming exercise	2
3		3C	Programming signal generators, and spectrum analyzers. Injecting arbitrary waveform, recording arbitrary waveform	2
3		3D	Power amplifier measurements refresher (e.g. noise figure, AM/AM, AM/PM, Psat, P1dB, OIP3)	2
4	Day 4- 19 Jun	4A	Workshop: Fully automated PA measurement/ modeling using Python and real test equipment	8
Total	4 Days		32 Study hours	

Pricing and registration:

For pricing quotations and registration, please contact our training centre manager: Mrs. Ilanit Kalman, Email: Ilanit.k@int-rf.com or at info@int-rf.com