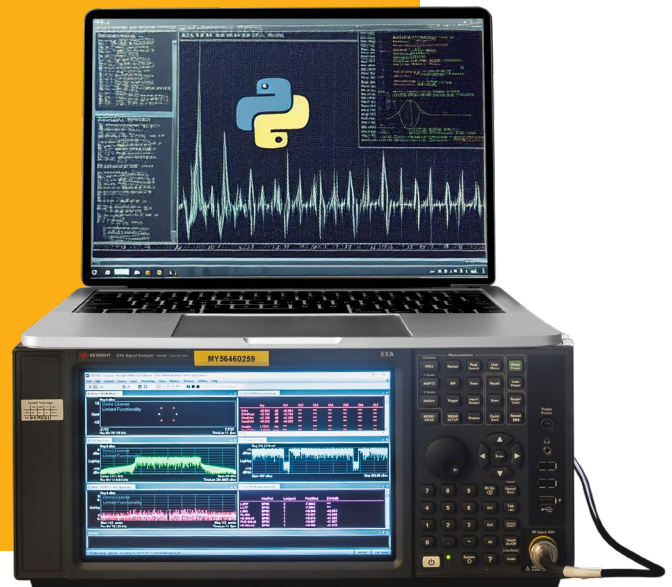# INTERLLIGENT
RF & Microwave Solutions

Training course program

Lab Instrument Control Using Python

40 study hours | Begins: November 10, 2025

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Lab Instrument Control Using Python

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 - Zero to Hero

Free interactive Python Turorial

Programiz Online Compiler (Interpreter)

Teachers

The course will be given 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 40 study hours comprising 4 frontal course days (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
Day 1 **November 10**	1A	The PyCharm development Environment, git version control	2
	1B	Mini exercise - environment warm up	2
	1C	Introduction to Python: Basic Commands (print, input, for, while, if), Python types (int, float, list, string, dictionary, tuple), functions	4
Day 2 **November 17**	2A	Python standard libraries (e.g. pathlib, datetime, time, logging)	2
	2B	The virtual environment, Python third party libraries (e.g. numpy, matplotlib, pandas)	2
	2C	Instrument control via Python (SCPI, PyVISA). Spectrum analyzer control	2
	2D	Mini exercise - spectrum analyzer control via PyVISA	2
Day 3 **November 24**	3A	Python classes	1
	3B	Configuration files using Yaml	
	3C	PyQt6 GUI - The GUI designer, Python application (main, init, signals & events, callback functions)	4
	3D	Controlling a signal generator, ARB generation, multitone generation	1
	3E	Mini exercise - signal generator control. Multitone generation	2
Day 4 **December 1**	4A	SCPI deep dive	1
	4B	PyQt advanced features (timers, threads, signals)	2
	4C	Useful widgets (visualization, logging, SCPI wrapper)	1
	4D	Python executables, the PYTHONPATH environment variable	2
	4E	Mini exercise - signal generator and spectrum analyzer control	2
Day 5 **December 8**	5A	Power amplifier measurements refresher (e.g. Gain, AM/AM, AM/PM, Psat, P1dB, OIP3)	1
	5B	Workshop: Fully automated PA measurement using Python and real test equipment, comprising: PyQt6, threads, signals, timers, VISA and SCPI, real time graphics, logging, configuration	7
Total: 5 Days			**40**

Pricing and registration

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