

Classroom and Online (E-Learning) Training

Training Overview

Classroom and online (e-learning) training courses are for users wishing to improve their knowledge of and expertise with NI AWR software. In addition to live training in a classroom setting, supported customers can take advantage of online web events, on-demand video training through the e-learning portal, and partner programs with Besser Associates, Oxford University, and other industry experts.

Typical Classroom Curriculum

Microwave Office for Designers

This two-day training provides an overview of Microwave Office for designers. No prior experience with the software is required. Attendees will gain a working knowledge of the major parts of the software using hands-on exercises throughout the course to emphasize concepts. The course is broken up into three major parts: circuit simulation in the schematic and graphing environments, layout, and EM simulation. The EM simulation discussion will cover both AXIEM 3D planar and Analyst™ finite element method (FEM) EM simulators.



Equations/Scripting in Microwave Office Software

This two-day class focuses on equations and scripting. Equations and variables are used at some point by most designers using Microwave Office software. Variables are used in everything from sweeping parameters, to storing data, to changing layout dimensions. Equations, on the other hand, are used in conjunction with variables to manipulate data and control the software. For example, custom measurements (output equations) can be written that extend the measurement capabilities of the software. Scripting is a more sophisticated way to customize the software, enabling the designer to write a script that automatically performs various useful functions, such as manipulating data, changing layouts, and creating graphs. The scripting environment built into Microwave Office software, which uses VBScript, will be highlighted and Python scripting will be briefly mentioned.

Advanced EM Concepts and Features in Microwave Office Software

This two-day class presents concepts and features in the Microwave Office circuit design environment. The first day highlights important concepts the designer needs to understand for successful simulations such as ports, boundaries, and meshing. Various tradeoffs in settings of the AXIEM planar method-of-moments (MoM) and Analyst 3D FEM EM simulators based on physical principles will be explained. The second day presents useful features in Microwave Office software that help designers with layout and simulation control, including parameterized layout, pre-processing rules, and multi-technology. Topics discussed will include using parameters for making EM models, use of PCells, and using multiple PDKs. Advanced extraction control will also be discussed.

Wireless Communications/Radar Systems Design in VSS

This one-day class introduces Visual System Simulator™ (VSS) software for the creation and simulation of complex wireless communications and radar systems. The overall VSS flow will be explained using illustrative examples. An overview of communications/radar systems will be presented, including architecture and VSS features such as RF budget (RFB), RF inspector (RFI), and time domain. RF-link design and analysis will be discussed, as well as antenna design and simulation, ADC/DAC modeling and modulation/coding, and digital-signal processing.

E-Learning Overview

For users wishing to target specific technologies and applications or who need to learn as their time permits, NI AWR software offers online web events on the ni/awr portal and through the Microwave Journal technical webinar series, as well as online pre-recorded videos through the e-learning portal. The e-learning portal enables software users with an active evaluation, maintenance contract, and/or term license of NI AWR software to learn more about the software on demand. The portal offers numerous training modules on various aspects of the software, from introductory overviews to advanced and specialized modules.

New Users and/or Core Curriculum

- Microwave Office Circuit Schematic
 - Environment
 - Hotkeys
 - Drawing
 - EM Extract
- VSS System-Level Design
 - RF Link
 - Components
 - Co-Simulation
 - Model Options
 - Phased Array
- AXIEM and Analyst Electromagnetics
 - Introduction
 - Project Creation
 - Properties/Setup
 - AXIEM
 - EMSight™
 - Analyst
- Harmonic Balance
 - HB Basics
 - Measurements
 - Two Tone
 - Sweeps/Power
 - Mixer
- EM Advanced Features
 - Process Creation
 - Data Sets
 - Shape Modifiers
 - EM Extraction
- Layout
 - Introduction
 - Drawing Basics
 - Import/Export
 - Layout Cells

Advanced Features Curriculum

- Analyst Overview
 - Introduction
 - 3D Cells
 - Coil
 - Extrusion
 - Intersection
- Multi-Technology Circuit Design
 - Introduction
 - Libraries/PDKs
 - Multiple Libraries
 - Units/Position
 - EM for Multi-Technology
- EM Analysis: Planar EM in Depth
 - EM Within Microwave Office
 - Process Creator
 - LPF Examined
 - Drawing Layers
 - LPF ASCII

Specialized Curriculum

- RF PCB Import Wizard
 - Flows
 - Layout File Formats
 - Design Import Example
 - EM Setup Example
 - Meshing Best Practices
 - Point Ports Explained
 - Point Port Example
- Antenna Synthesis
 - Introduction
 - WiFi Antenna
 - AXIEM EM Simulator Export
 - Analyst EM Simulator Export



Meet the Trainer

Dr. John Dunn is a senior engineer/ EM technologist at AWR Group, NI and spearheads our training programs. Before entering the commercial electronics industry, Dr. Dunn was a professor of electrical engineering at the University of Colorado, Boulder, for 15 years. He earned his M.S. and Ph.D. degrees in applied physics from Harvard University, Cambridge, MA, and his B.A. in physics from Carleton College, Northfield, MN.