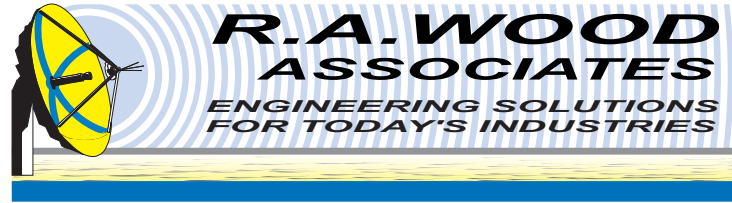


ANNOUNCING WIRELESS COURSES FOR 2010!



R. A. Wood Associates is providing 3 state-of-the-art Wireless courses for the year 2010. The courses will be presented in Baltimore, MD; Philadelphia, PA, and Syracuse, NY. The courses are tailored toward scientists, engineers, managers, and technicians working in the commercial or military wireless industries. We are also available to hold the courses at your facility.

Introductory RF and Microwaves

presented by Robert A. Wood

May 12 - 14 - Baltimore, MD

September 22 - 24 - Philadelphia, PA • October 20 - 22 - Syracuse, NY

RF and Microwave Receiver Design

presented by Robert A. Wood

May 17- 20 - Baltimore, MD

September 27 - 30 - Philadelphia, PA • October 25 - 28 - Syracuse, NY

RF Power Amplifiers, Classes A-S: How the Circuits Operate, How to Design Them, and When to Use Each

presented by Nathan O. Sokal

May 10 & 11 - Baltimore, MD

September 20 - 21 - Philadelphia, PA • October 18 - 19 - Syracuse, NY

Comments from Previous Course Attendees:

"I am very satisfied with the overall seminar quality, It fully met my expectations and I think I will have a lot of help from it in my daily work. The sheets were of excellent quality and I am amazed that so much can be exchanged in 3 days"

"This was a great course...Bob was very knowledgeable of receivers. I also had most of my questions answered. The view graphs were very informative, not like most"

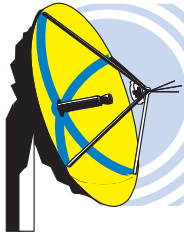
"Instructor very good - concerned about the students learning the material, and willing to modify the course for the students"

"Overall rating for course: Excellent"

"This course answered most of my questions that I had when I came to the course"

"Questions and inquiries were well received and comprehensively answered"





Introductory RF and Microwaves

May 12 - 14 - Baltimore, MD

September 22 - 24 - Philadelphia, PA • October 20 - 22 - Syracuse, NY

This 3-day course is an introduction to the exciting field of RF and Microwaves. It is intended for engineers, managers, and technicians who need to be introduced to the particular aspects of RF and Microwave signals and the associated testing and measurement procedures. Includes hands on lab exercises utilizing common equipment and test setups.

Instructor: Robert A. Wood

Course Outline

- What is RF and Microwave?
- RF and Microwave Frequency Bands
- Differences: Analog and RF/Microwave Signals
- Electromagnetic Waves
- Microwave Power - dB's and dBm's
- Forward and Reflected Waves
- Insertion Loss and Gain
- Return Loss
- VSWR and Impedance Matching
- Characteristic Impedance
- Transmission Lines
 - Coax, Waveguides, Stripline, Microstrip
- S-Parameters
 - S11, S21, S12, S22
- Test Equipment - Signal Sources
- Test Equipment - Measurement Devices
 - Detectors
 - Power Meters
 - Spectrum Analyzer
 - Scalar Analyzer
 - Network Analyzer
 - Frequency Counter
- Test Equipment - Auxiliary Equipment
 - Couplers
 - Power Dividers, Combiners
 - Attenuators
 - Switches
- RF and Microwave Measurements
 - Power/Amplitude
 - Gain/Insertion Loss
 - VSWR
 - Frequency
 - S-Parameters
 - Spurious
 - Gain Compression
 - Phase Measurement
 - Group Delay
 - Noise Figure
 - Distortion Products
 - Phase Noise
- Computer Automated Testing
 - Software Programs
 - Platforms
- Calibration Concepts
- RF and Microwave Test Techniques and Tips
- Digital Modulation of RF Signals- Quick Overview



"This course provides an excellent overview of RF and microwave theory. It gave me the much needed knowledge of how to perform RF measurements in my job."



Seminar Materials Provided

Understanding Microwaves by Allan Scott, John Wiley & Sons, Inc., 1993; and comprehensive seminar notes.

Who Should Attend

Engineers, managers, and technicians who are new to RF and Microwaves and need an overview of this field so they can immediately become productive in this exciting new area.

Biography

Robert Wood has over 26 years experience in design, development, integration, and production programs for EW Systems. From 1979 to 1994, he worked at Lockheed Martin and GE Aerospace in Utica, NY, where he has provided technical leadership for B-1, A-12, and F-22 EW programs. He has developed numerous analysis programs for RF and microwave system design. Most recently, Mr. Wood is president of R. A. Wood Associates, providing engineering consulting services and educational seminars for RF and microwave industries, both defense and commercial related. He received a BSEE from Worcester Polytechnic Institute in 1979 and an MSEE from Syracuse University in 1982.

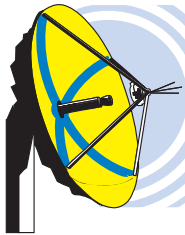


"Very good content. Liked the relationship of theory to practical applications using test equipment."



"Good practical hints and methods reviews. Should be helpful for problem-solving in shops area. Demonstrations with equipment were very helpful for clearing up questions."





RF and Microwave Receiver Design

May 17 - 20 - Baltimore, MD

September 27 - 30 - Philadelphia, PA • October 25 - 28 - Syracuse, NY

Learn how to design RF and microwave receivers from a system design viewpoint. Understand the receiver requirements and how to flow the requirements to circuit design level and back. A must for anyone involved in specifications, receiver design, RF circuit design, and microwave system development. The material applies to all types of receiver design, from commercial wireless designs to defense-related RF and microwave systems. A receiver design example will be followed throughout the course.

Instructor: Robert A. Wood

Course Outline

Day 1

Overview of Receiver Applications

- Radar
- Electronic Warfare
- Communications

Receiver System Requirements

- EW Receiver Example
- Radar Example
- Communications Example

Overview of Receiver Types & Architectures

Receive System Characteristics

- Sensitivity, Noise Figure, Dynamic Range
- 1 dB Compression Point
- Third Order Intercept Point
- Second Order Intercept Point

Sample Receiver Design - Part 1

Day 2

- Flatness, Gain Variation
- Receiver Interference Considerations
 - In-Band Spurious Signals
 - Pre-Selection Spurious
 - Leakage Signals
 - Noise

Receiver Components and Parameters

- Antennas
- Amplifiers
- Mixers
- Filters and Diplexers
- Attenuators
- Isolators and Circulators
- Switches
- Couplers and Power Dividers
- Local Oscillators (LO)

LO Thermal and Phase Noise, LO Spurious

Sample Receiver Design - Part 2

Day 3

Sample Receiver Design - Part 3

Lessons in Interfacing with Receivers

System Analysis Process Flow

Future Trends and Analysis Tools

- Spreadsheet Analysis
- Receiver Design Software Packages

Statistical Design Techniques

Wireless System Design Considerations

Requirements Derivation

Recommended Further Reading

"This was the most interesting problem so far and I learned a lot."

"Excellent overview of receiver design."

Seminar Materials Provided

Practical RF System Design by William F. Egan; and comprehensive seminar notes.

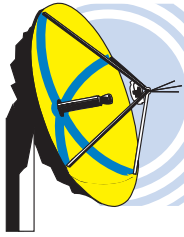
Who Should Attend

System engineers, RF and microwave circuit design engineers, scientists, and managers involved in design, specification or management of receiver development for defense or commercial wireless industries.

Biography

Robert Wood has over 26 years experience in design, development, integration, and production programs for EW Systems. From 1979 to 1994, he worked at Lockheed Martin and GE Aerospace in Utica, NY, where he has provided technical leadership for B-1, A-12, and F-22 EW programs. He has developed numerous analysis programs for RF and microwave system design. Most recently, Mr. Wood is president of R. A. Wood Associates, providing engineering consulting services and educational seminars for RF and microwave industries, both defense and commercial related. He received a BSEE from Worcester Polytechnic Institute in 1979 and an MSEE from Syracuse University in 1982.

"Both the presentation and presenter were very good. The atmosphere was very relaxed, with ample room for informal discussions. The presenter appeared very knowledgeable in the field. The demo software gifts were a great idea."



RF Power Amplifiers, Classes A thru S: ***How the Circuits Operate, How to Design Them,*** ***and When to Use Each***

May 10 & 11 - Baltimore, MD

September 20 - 21 - Philadelphia, PA • October 18 - 19 - Syracuse, NY

This 2-day course provides a detailed summary of the various classes of RF Power Amplifiers, and where each class is used in today's wireless designs. Amplifier Classes A through S are defined, including the advantages, disadvantages, applications, and circuit topologies for each class. If you are using or designing RF Power Amplifiers in today's wireless designs, then this course will help you use or design the right class of RF Power Amplifier for the right application, the first time around.

Instructor: Nathan O. Sokal

Topics Covered

- Saturated and Unsaturated (linear) Amplifier Classes A - S
- Transistor Utilization Factors
- Operating Modes of BJT's, MOSFETS, & MESFETS
 - Current Source (Linear)
 - Switching (Saturated)
 - Mixed Mode
- Transistor and Circuit Operating Conditions
- Controlling RF Output Amplitude vs. Information Modulation
- Oscillation and Stability
- Application Areas, Benefits, Shortcomings for each Circuit
- Linear Amplifier Systems using RF Power Amplifiers
- CAD of Switching Mode RF Power Amplifiers

Course Outline

RF Power Amplifiers - Overview

- Physical Realizations
 - Monolithic vs. Discrete Components
- Amplifier Classes vs. Transistor Operating Modes
- Applications
- Efficiency
 - Definitions & Equations
 - Transistor Limits
- Transistor Utilization Factor

Amplifier Classes and Operation

Linear Power Amplifiers - Classes A, AB, B, C, F1

- Class A, AB, B - Circuit Operation Definitions
 - Single Ended, Push-Pull
 - Input/Output Transfer Functions
 - Bias Points; Biasing for Minimum Distortion
- Class C Amplifier
 - Efficiency vs. Power, Vcc, Bandwidth
- Class F1 Amplifier
- Stability - Linear Amplifiers

Switching Mode Amplifiers - Classes D, E, F2, F3, S

- Benefits vs Linear Amplifiers
- Principles for High Efficiency
- Design Difficulties
- Class S Amplifiers

Discussion Topics - Switching vs. Linear Families

- Switching (Class E) vs. Linear (Class B & C)
- Experimental Results - Class E
- Class E Applications by Modulation Type
- Advantages & Disadvantages - Class D vs Class E
- Mixed Mode Amplifiers - part Linear and part Switching

System Level Topics

- Predistortion of Input Signal
- Feed-Forward Correction of Nonlinearity
- Envelope Elimination and Restoration (EER)
- LINC (Linear amplification with Nonlinear Components)
- Amplitude Control vs. Modulation
- Choice of Power Amplifier Type

Switching Mode Power Amplifier Circuit Design Methods

- Analytic, Numerical, Programs
- Circuit Computer Aided Design (CAD) Considerations
- CAD Examples - Classes D & E
 - Real Circuit Complications
 - Evaluation, Simulation, & Measurement Comparisons
- Impedance Matching Networks
- "Hands-On" Exercise
 - Design and Optimize a Class E or D Power Amplifier

Second Day: Further Discussion of Topics of Interest

Seminar Materials Provided

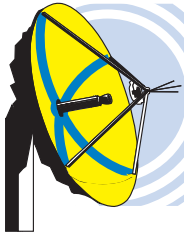
A comprehensive set of seminar notes is included.

Who Should Attend

Beginner through advanced design engineers and their supervisors, who are concerned with designing any type of RF power amplifier product, e.g., cell-phone handset, wireless device, radio transmitter, or RF-power source for induction or dielectric heating, plasma generation, or illumination.

Biography

Nathan O. Sokal was awarded the 2007 IEEE MTT-S Microwave Pioneer Award "in recognition of a major, lasting contribution...at least twenty years prior to the year of the award...for development of the Class-E RF Power Amplifier." He was elected a Fellow of the IEEE in 1989, for contributions to the technology of high-efficiency power conversion and RF power amplification. In 1965, he founded Design Automation, Inc., a consulting company doing electronics design review, product design, and solving "unsolvable" problems, for equipment-manufacturing clients. Much of that work has been on high-efficiency switching-mode RF power amplifiers at frequencies up to 2.5 GHz, and in switching-mode DC/DC power conversion. He holds eight patents in power electronics, and is the author of one book and more than a hundred technical papers, mostly in high-efficiency generation of RF power and DC power. During 1950-1965 Nathan held engineering and supervisory positions for design, manufacture, and applications of analog and digital equipment. He received B.S. and M.S. Degrees in Electrical Engineering from M.I.T. in 1950. Nathan is a Technical Advisor to the American Radio Relay League, on RF power amplifiers and DC power supplies, and a member of the Electromagnetics Society, Eta Kappa Nu, and Sigma Xi honorary professional societies.



R. A. Wood Associates ***Course Registration Information***

Registration

All seminars are filled on a first come, first served basis. Class sizes are limited, therefore early registration is highly recommended. Upon calling and registering you will be informed of the hotel, location, and phone number to make your reservation for lodging.

The Registration Fee of \$125.00 will reserve a seat for you at one of these important courses. The Registration Fee is applied towards the total course fee.

To Register, Mail or Fax completed registration form with payment, credit card information, or purchase order to:

R. A. Wood Associates
1001 Broad Street, Suite 450
Utica, NY 13501

Fax: (315) 735-4328
Voice: (315) 735-4217
E-mail: RAWood@rawood.com
WWW: <http://www.rawood.com>

You can also register by phone. Contact our office at the phone numbers above and we will register you.

We also have setup online payments for these courses from our web site at: <http://www.rawood.com/seminars>

Full payment must be received no later than five business days prior to the starting date of the course. Payments may be made by check, purchase order or credit card (MasterCard, VISA, or American Express).

Cancellation Policy

A full refund of the registration fee is given for cancellations received 10 or more business days prior to the starting date of the course. The registration fee is nonrefundable after this date.

Course Times

Classes start at 8:30 a.m. and end at 5:00 p.m., with breaks throughout the day. Please arrive at 8:00 a.m. on the first day of the course to sign-in and receive course materials.

Course Fees

Course fees cover instruction, course material, text books (if needed), and refreshments. Travel and lodging for students are not covered expenses and are the responsibility of the individual and/or sponsoring business.

Location/Hotel Information

A map indicating the course location and details regarding hotel accommodations will be sent to you with your registration.

**REGISTER TODAY — SIMPLY FILL OUT THE REGISTRATION FORM TO SECURE YOUR
SPACE IN THESE IMPORTANT SEMINARS!**

R. A. Wood Associates reserves the right to cancel courses due to insufficient number of registrants. In the event of R. A. Wood Associates' cancellation, R. A. Wood Associates will reschedule the course, refund course fees or apply the fee payment to any other R. A. Wood Associates course offered in the next twelve months. Liability for course cancellation is specifically limited to the amount of prepaid course fees and excludes any incidental or consequential damages.

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R. A. Wood Associates Wireless Course Registration Form

Registration is easy! Just print and fill out the form below, and mail, e-mail, fax, or phone the information to us.

R. A. Wood Associates
1001 Broad Street, Suite 450
Utica, NY 13501

Voice: (315) 735-4217
Fax: (315) 735-4328
RAWood@rawood.com
www.rawood.com

2010 Course Dates and Locations (please circle courses and locations):

	Early Registration Deadline	Introductory RF and Microwaves	RF and Microwave Receiver Design	RF Power Amps Classes A-S
Locations:				
Baltimore, MD	April 12	May 12 - 14	May 17 - 20	May 10 & 11
Philadelphia, PA	Aug 22	Sept 22 - 24	Sept 27 - 30	Sept 20 -21
Syracuse, NY	Sept 20	Oct 20 - 22	Oct 25 - 28	Oct 18 - 19

Course Fees:

Instructor:	-	Robert A. Wood	Robert A. Wood	Nathan O. Sokal
Duration:	-	3 Days	3 1/2 Days	2 Days
Course Fee:	-	\$1295	\$1525	\$950
Early Reg Fee:	-	\$1245	\$1475	\$900

Payment Information:

Student Name:	Payment Method (Please Check one):
Company/Organization:	<input type="checkbox"/> Check, Amount Enclosed: \$ _____
Company Training Director: (Contact Person)	<input type="checkbox"/> P.O. Number: _____ (Please attach company P.O.)
Company Address:	<input type="checkbox"/> Credit Card Number: _____
City, State, Zip, Country:	Circle One: MC, VISA, AMEX
E-mail Address:	Expiration Date: _____
Phone:	Name: _____ (As printed on card)
Fax:	Signature: _____