



HP Test & Measurement Customer Education Catalogue 1997/98

Dear Test & Measurement Colleague

As technologies merge, product lifecycles decrease and resources change, companies are under constant pressure from increased competition. A well educated workforce is one of the most important needs of a company competing in industry today.

At Hewlett-Packard, we have developed the courses in this catalogue to help you improve the consistency of your measurements and maximise the return on your investment in people and test equipment. With shorter start-up and development times, you will be in a strong competitive position.

In this catalogue you will find a wide range of scheduled courses in different application areas and at various skill levels. There is a good choice of locations throughout Europe on different dates.

You may be looking for specific training that matches your company's development needs very closely. As well as the classroom-based courses, we are equipped to bring the training to your site if this is more valuable. We can readily integrate material from different courses too. If you are undertaking a complete evaluation of your education needs, do ask us to assist in developing an individual Education Plan for your people.

May I encourage you to take advantage of HP's years of experience and expertise in the Test and Measurement business by using the information provided in this catalogue to identify courses for your needs. Even if your requirements differ from what is published here, do contact us. We will find a way to help you be successful.

Yours faithfully,

Jose Luis Garcia European T&M Customer Education Manager

Using this Catalogue

Use this catalogue to identify courses that meet your training needs. It contains detailed information that will allow you to map your most efficient route to success.

Begin with the table of contents which details the broad application areas. Indexes are given at the end of the catalogue to make cross-referencing easy.

Why choose Hewlett-Packard training?

Consider these advantages of HP classroom training:

Return on investment

Attending an HP training course will increase your productivity which in turn will give you a good return on investment (ROI).

To calculate your percentage ROI you can subtract your total investment in the course you would like to attend, from your return per year (depending on Productivity increase), divide by the total investment, multiply by 100. This gives you your % ROI, and you will understand why you need to have your people trained.

Time to market

In order to compete, the race is on to get products to market faster. Training will help your people to become more productive, enabling them to cut development lead times and thus reduce the time to market.

HP instructors

HP instructors are experts in using and applying HP instrument systems to meet your measurement needs. We continually train our instructors to make sure that they are technically proficient and are skilled teachers.

Real-world approach

HP Education is characterised by hands-on experience and interactive class discussion. HP training pays off immediately because HP courses are geared to real-world solutions of real-world problems.

Focused learning environment

HP sites have all the facilities required to help the student focus on learning away from the pressures of everyday work.

Valuable HP classroom and follow-up materials

Copies of course material are provided for helpful future reference.

Consistent HP quality

The same high quality standards are built into HP courses that you have come to expect from every HP product. For every course, all students are invited to make their recommendations, and these are built into improving the quality of the courses. Classes are limited to a maximum of **10** students.

Unparalleled experience

For more than 50 years, HP has been the recognised leader in the field of Test & Measurement. This wealth of experience and knowledge is behind every training course we offer.

Other training possibilities with HP

The courses presented in this catalogue represent only a taste of the educational facilities available to HP Test & Measurement customers. If HP does not offer a course that suits you, we can work with you to design a programme that will. In addition to formal classroom training, consider the following options:

On-site classroom training

Allow us to bring our courses to you. We can train your entire staff, using your hardware or ours, emphasising topics important for your environment. This method can be very cost-effective for those customers with many students requiring common training because it allows you to schedule training at the best time, and eliminates travel and accommodation costs.

Customised on-site classroom training

You can take further advantage of the on-site training by combining topics from multiple courses, giving added weight to priority areas and adding topics of specific interest.

Productivity assistance

Once your measurement system is installed and running, you may want additional help in your own applications. An experienced HP application engineer can get you up to speed faster, and show you the latest tips and techniques for taking accurate measurements and managing your system's performance.

Registration Information

For registration or information concerning a specific course including content, prerequisites, and availability, call your nearest Test & Measurement Customer Education Representative.

If a class is not scheduled or is not offered in your location...

These 'on-demand' courses are presented in one of two ways:

1) You may request to be put on the course's INTEREST LIST. When there is sufficient demand for a course, it will be scheduled.

2) If you are working within a specific time frame you should ask for a support manager to contact you and explore on-site or other equivalent HP training possibilities.

If your training requirements are unique...

Over the years, HP has developed numerous training materials, training seminars, and application notes and tools to help you get the job done. Although they are not explicitly referred to in this catalogue, some of them may be appropriate for your special training needs.

If you don't find a course listing that meets your requirements, please call your nearest Test & Measurement Customer Education Contact. A Support Manager will contact you to discuss your training needs.

Hewlett-Packard's Customer Education Department is now registered by the IEE/IMechE as an Approved Provider for the assessment of Continuing Professional Development (CPD) activities. The courses described in this catalogue are categorised as Interactive Technical events, and will earn 4.5 Professional Development Units per day of training. All students registered with the IEE CPD scheme should ensure that they bring their registration card with them to the course, so that attendance can be validated by the instructor.

Course catalogue.

The information in this catalogue is for planning purposes during the months indicated. Hewlett-Packard reserves the right to change or cancel classes in this catalogue. In case of alterations to the published programme or cancellation, registered students will be notified at least five working days prior to the scheduled start date.

Cancellation procedure.

In consideration to other customers, HP requests that if you need to cancel or reschedule a course, that you contact us at least 10 working days before the first day of the course. To cancel a place, please phone your local Test & Measurement Customer Education Representative quoting the registration number from your registration confirmation letter.

If the class was full, this will give another customer who is on the WAIT LIST enough time to make arrangements to attend. If numbers are already low, your early cancellation gives HP the opportunity to give other attendees better notice of the need to cancel a complete course.

Cancellation policy.

Customers who cancel or reschedule at least ten working days before a course commences will not be subject to pay any fee. HP reserves the right to bill the full course fee to customers who cancel or reschedule after that day.

HP's commitment to you.



At least seven working days before the course starting date. HP will review its enrolment. If there are sufficient numbers, HP will assign the resources necessary to run the class and deliver to you a quality training product. However, if the numbers are insufficient, HP will cancel the course and notify all students. In the event of a cancellation we will maintain our commitment by working with you to develop an alternative plan that will satisfy your training needs.

Prices.

HP reserves the right to change course prices at any time. In the event of such a change, confirmed registrations will be kept at the original price. Registrations confirmed by a purchase order within 30 days of a price increase will also be honoured at the original price.

T&M Customer Education Representatives

Austria

Andrea Walter Hewlett-Packard GmbH Schickardstrasse 2 D-71034 Böblingen Phone: +49(0)7031 14 6247 Fax: +49(0)7031 14 3931

Belgium

Jany Vandevloed Hewlett-Packard Belgium SA/NV Boulevard de la Woluwe 100 Woluwedal B-1200 Brussels Phone: +32 2 7783605 Fax: +32 2 7783414

Denmark

Rebekka Boennelykke Hewlett-Packard A/S Kongevejen 25 DK-3460 Birkerod Phone: +45 45991475 Fax: +45 45820630

Finland

Anita Gullstrom-Rantanen Hewlett-Packard OY Piispankalliontie 17 FIN-02200 ESPOO Phone: + 358 0 88721 Ext: 2380 Fax: + 358 0 8872 2923

France

Catherine Serva Hewlett-Packard France ZI de Courtaboeuf Avenue de Canada, 1 91947 Les Ulis Cedex Phone: +33 1 69826629 Fax: +33 1 69826223

Germany

Andrea Walter Hewlett-Packard GmbH Schickardstrasse 2 D-71034 Böblingen Phone: +49 (0)7031 14 6247 Fax: +49 (0)7031 14 3931

Italy

Gianni Caffari Hewlett-Packard Italiana S.p.A. Via G. Di Vittorio, 9 20063 Cernusco S/N Milano Phone: + 39 2 921 2448 Fax: + 39 2 921 41485

Netherlands

Remco De Jong Hewlett-Packard Netherland B.V. Startbaan 16 1187 XR Amstelveen Phone: +31 (0)20-547 7806 Fax: +31 (0)20-547 7765

Norway

Ingeborg Floenes Hewlett-Packard Norge A/S Drammensveien 169 0212 OSLO Phone: +47 22735750 Fax: +47 22735619

Portugal

Ana Mendes Hewlett-Packard Portugal, S.A. Edificio Escritorios Parque Oceano Avenida Marginal, piso 5G Sto. Amaro de Oeiras 2780 Oeiras Phone: + 351 1 4828500 Fax: + 351 1 4417077

Spain

Montserrat Cervera Hewlett-Packard Española, S.A. Ctra. La Coruña Km. 18,300 28230 Madrid Phone: +34 (9) 1 6311330 Fax: +34 (9) 1 6311469

Sweden

Liselotte Karlgren Hewlett-Packard Sverige AB Skalhotsgatan 9 164 93 KISTA Phone: +46 8 4442328 Fax: +46 8 4442363

Switzerland

Gillian Weideli Hewlett-Packard (Schweiz) AG In der Luberzen 29 8902 Urdorf/Zürich Phone: +41 1 7357311 Fax: +41 1 7357703

United Kingdom

Sharon Queripel Hewlett-Packard Limited Cain Road Bracknell Berkshire RG12 1HN Phone: +44 (0) 1344 366766 Fax: +44 (0) 1344 362092

Other Countries

Marylin Breux Hewlett-Packard Europe Rue de Veyrot 39 CH-1217 Meyrin1/Genève Phone: +41 22 7804113 Fax: +41 22 7804770

Table of Contents

Section	
1	Pages 1 – 3
2	Pages 4 – 6
3	Pages 7 – 10
4	Pages 11 – 15
5	Pages 16 – 18
6	Page 19
7	Page 20
8	Pages 21 – 24
9	Pages 25 – 26
10	Page 27
11	Pages 28 – 30
12	Pages 31 – 35
13	Page 36
	Section 1 2 3 4 5 6 7 8 9 10 11 12 13

Index – by Course Subject

Pages 37 - 39



Standard Instrument Control Library (SICL) for HP VEE-TEST **Instrument Programmers**

Classroom: HP 98880A+24F HP 98880A+24I **On-Site:**

Course for: Application Programmers.

Learn SICL library of I/O routines. The standard way to control test instruments.

Course Content:

- C Review
- General SICL Library
- HP-IB SICL Library
- VXI SICL Library
- RS-232 SICL Library
- **Futures**

Prerequisites: ANSI C Programming knowledge is essential. Fundamentals of the UNIX System is recommended.

Duration: 2 days

Introduction to

Classroom: HP E2110B+24B On-Site: HP E2110B+24G

Course for: Scientists, Engineers and Programmers.

Use the HP Visual Engineering Environment (HP VEE-TEST) to create models and test programs. Understand the fundamentals of HP VEE software, application development and interprocess communication.

Course Content:

- Principles of Operation
- Using HP VEE Objects
- **Application Development** Techniques
- I/O Transactions and **Data Formatting**
- Files and Standard I/O
- Configuring and Customising HP VEE
- **Instrument Control Interfaces**
- Using Drivers for Instrument Control
- Using Direct I/O
- Instrument Application **Development** Techniques

Prerequisites: A foundation in programming.



Advanced HP VEE Test

Classroom: HP E2110C+24B On-Site: HP E2110C+24G

Course for Engineers and Technicians who have been using HP VEE Test for several months.

You will learn advanced features of HP VEE. We will emphasise advanced communication with instruments, data exchange and experience sharing.

Course contents:

- Dynamic Data Exchange (DDE)
- Dynamic Link Library (DLL)
- Driver Writing: Plug and Play -Driver
- Direct I/O for non HP drivers
- Serial Interface
- Organisation of an application
- Experience sharing

Prerequisites: HP VEE Test Training (E2110B+24B) and at least 6 months programming experience with HP VEE.

Duration : 3 days

Introduction to VXIbus

Classroom: HP E1300A+24B On-Site: HP E1300A+24G

Course for: Engineers and Technicians.

Learn the fundamental aspects of the VXI bus and understand how it might help you solve your application problem.

Course Content:

- History
- Foundation of VXIbus
- Instrumentation environment
- Devices and communication
- Contributions to automated test
- Integration with other architectures
- Test system throughput
- Standard Instrument Commands

Prerequisites: None.

Duration: 1 day

Test System Products and Development Tools

Advanced VXI/Embedded Controller

Classroom: HP E1401A+24E On-Site: HP E1401A+24H

Course for: VXI users developing test programs mainly with C-tools.

Learn the functionality of embedded control using an external HP controller with a VXI/MXI interface.

Course Content:

- VXI Configuration
- VXI Communication
- Register based devices
- Messages based devices
- Configure and use systems with command module
- Advanced configuration and instrument control

Prerequisites: Familiarity with HP BASIC or UNIX and C Programming.

Duration: 4 days

Additional courses available

Programming with HP BASIC

Classroom: HP 98616B+24B On-Site: HP 98616B+24G

Programming Instrumentation with HP BASIC

Classroom: HP 98616B+24E On-Site: HP 98616B+24H

HP BASIC/UX Programming and Operating course

Classroom: HP 98880A+24B On-Site: HP 98880A+24G

Developing Drivers for HP VEE-TEST

Classroom: HP E2110B+24E On-Site: HP E2110B+24H

VXIbus Technology

Classroom: HP E1401A+24B On-Site: HP E1401A+24G

NEW

TestExec SL

Classroom: HP 44638A+24B On-site: HP 44638A+24G

FFT Measurements

Classroom: HP 35665A+24B On-Site: HP 35665A+24G

Course for: Technicians and Engineers.

Gain an understanding of the basic signal processing and analysis that takes place in a Dynamic Signal Analyser. Learn to make accurate measurements on general signals and networks.

Prerequisites: Some experience with a Dynamic Signal Analyser is recommended.

Duration: 1 day



HP 35670 Dynamic Signal Analyzer Course

Classroom: HP 35665A+24E On-Site: HP 35665A+24H

Course for: Technicians and Engineers using the HP35670A.

Learn the specifics of using this new Dynamic Signal Analyzer with typical real world measurement data. Become familar with proper setup for spectrum and network measurements, data, display scaling, use of Engineering Units and transducers, time capture measurements, and Standard Data Format utilities.

Course content:

- Using On-line Help
- System Utilities
- Managing files and discs
- Measurement setup basics
- Using transducers and Engineering Units
- Working with the display
- Plotting and printing
- Using Time Capture
- Correlation Analysis
- Statistical Sampling Analysis (Histograms)
- Math operations
- Standard Data Format Utilities
- Order Analysis (Option 1D0)
- Measuring sound (Real-time Octave Mode: Option 1D1)
- Microphone adaptor: (Option UK4)
- Swept Sine Mode (Option 1D2)
- Arbitrary Source (Option 1D4)
- Curve Fitting and Synthesis (Option 1D3)
- Keystroke Recording
- Introduction to Instrument BASIC capabilities
- Program entry and editing
- Mass storage Device I/O
- Instrument Specific Features

Prerequisites: Course FFT Measurements (HP35665A+24B) or similar knowledge.

Duration. 2 days

| Mechanical and Physical Test Instruments



Classroom: HP B2773A+24B On-Site: HP B2773A+24G

Course for: System operators and integrators who will be using RTAP in a production environment.

Learn about all the components of the RTAP/Plus product. Get hands-on experience with a sample RTAP / Plus application that monitors an automated house. Learn what an RTAP environment is and what its components are.

Course Content

- Introduction
- Overview
- RTAP/Plus System Operation
- RTAP/Plus Environment
- Database Configuration
- Alarm System
- Scan System
- Historical Data Gathering and Display
- Reporting
- Constructing User Interfaces
- System Wide Configuration

Prerequisites: Familiarity with RTAP/Plus, including RTAP demo and the technical data sheet, knowledge of 'vi' or 'emacs' text editor, basic UNIX operating system commands, familiarity with X Window System and SCADA system basics.

Duration : 5 days

NEW

RTAP/Plus Programming

Classroom: HP B2773A+24E On-Site: HP B2773A+24H

Course for: System integrators and programmers who will be developing applications with RTAP/Plus.

Gain an understanding of programming concepts specific to windows and event-driven systems using RTAP/Plus API (Application Programming Interface).

Course Content

- Perform database reads, writes and queries
- Send and receive messages
- Configure the event manager
- Configure the time keeper
- Send outputs and control sequences to field devices
- Access the alarm/historian/trending subsystems
- Load schematics and attach them to database
- Configure hot spots on a schematic
- Load and activate control panels
- Add a new function to the calculation engine
- Scan task

Prerequisites: Course HP B2773A+24B. C-programming experience, familiarity with UNIX utilities such as 'make'.



Additional courses available

Control System Measurements

Classroom: HP 35670A+24B On-Site: HP 35670A+24G

HP 3565S Toolkit Course

Classroom: HP 35635R+24B On-Site: HP 35635R+24G

Structure Analysis Measurements

Classroom: HP 35670A+24E On-Site: HP 35670A+24H

Rotating Machinery Measurements

Classroom: HP 35670A+24F On-Site: HP 35670A+24I

Acoustic Application Seminar

Classroom: HP 3569A+24B On-Site: HP 3569A+24G

HP 3562A Dynamic Signal Analyser Course

Classroom: HP 3562A+24B On-Site: HP 3562A+24G

VXI Toolkit Course

Classroom: HP 35635T+24B On-Site: HP 35635T+24G

HP 3852S User Training

Classroom: HP 3852A+24B On-Site: HP 3852A+24G Mechanical and Physical Test Instruments

For further information contact your local Customer Education Representative

Introduction to EMC and Regulations

Classroom: HP 11949A+24B On-Site: HP 11949A+24G

Course for: Engineers and Technicians.

Study EMC concepts, terminology, measurements and the various regulations to be applied to electronic devices and the importance of EMC through the product development cycle.

Course Content:

- EMC Introduction
- EMC Regulations
- Product Development Cycle
- Commercial Compliance Test
- Military Compliance Test
- Precompliance Test
- Diagnostic Test
- EMC design Techniques

Prerequisites: None.

Duration: 1 day

EMC Design Course

Classroom: HP 11949A+ 24E On-Site: HP 11949A+ 24H

Course for: Engineers designing for EMC.

Gain a solid understanding of the problems you may encounter in designing for electromagnetic compatibility (EMC) – and how to solve them.

Course Content:

- Introduction
- Non-conducted Coupling
- Common Impedance Coupling
- Radiation from Digital Circuits
- Cables
- Advance Cables
- Conducted Emissions
- Susceptibility
- Electrostatic Discharge
- Shielding
- Diagnostics

Prerequisites: A solid understanding of fundamental circuit theory.



EMI Measurements According To European Norms

Classroom: HP 11949A+ 24F On-Site: HP 11949A+ 24I

Course for: New quality, production and R&D Engineers requiring a basic understanding of the EMI Regulations in Europe, and measurement involved.

Learn how to correctly measure noise signals according to European Norms (E.N.) and understand EMC Compliance and Precompliance measurements.

Course Content:

- Uncertainty of EMC measurements
- Noise Analysis (Ambients, Impulse Noise, Discontinuous Noise)
- Standards E.N.'s (CISPR 16, 11, 22, 13 / IEC 801.-2, -3, -4, -5, -6)
- Testing according to the above norms
- Administrative process of Conformance Declaration

Prerequisites:

Course HP 11949A+24B or basic EMC knowledge, RF & MW measurement fundamentals (HP 50740A+24B).

Duration: 3 days

Spectrum Analysis Measurements

Classroom: HP 8591E+24B On-Site: HP 8591E+24G

Course for: Engineers and Technicians, both present and future users of spectrum analysers.

Learn to carry out and interpret Spectrum Analyser measurements and discuss technological parameters which determine measurement accuracy:

Course Content:

- Spectrum Analyser Architecture
- Sensitivity, Resolution, Accuracy
- Signal to noise measurements
- Amplitude Modulation Measurements
- Angular Modulation Measurements
- Pulse Modulation Measurements
- Scalar Measurements

Prerequisites: None

Duration: 1 day

Using Spectrum Analysers HP 859X and HP 856X

Classroom: HP 8591E+24E On-site: HP 8591E+24H

Course for: HP 859x and HP856x present and future users.

Learn to operate the HP 859x and HP 856x family of Spectrum Analysers to get maximum performance for your application.

Course Content:

- Basic Concepts
- Front Panel
- Measurements

Prerequisites:

Course HP 8591E+24B, or similar knowledge.

Duration: 1 day

RF and MW Instruments

and Systems

HP 89410A/89440A Vector RF & Microwave **Signal Analyser Course**

Classroom: HP 89440A+24E HP 89440A+24H **On-Site:**

Course for: HP89410A/89440A Users, Engineers and Technicians.

Learn the principles of vector signal analysis, measurement features of HP 89410A and HP 89440A and the capabilities of vector signal analyzers.

Course Content:

- Fundamentals of Vector Signal Analysis
- Basic Operations
- **Time and Time-Selective Frequency** Analysis
- Demodulation Analysis

Prerequisites: Vector Modulation Measurements Course (HP 89440A+24B) or equivalent.

Duration: 2 days

Measurements

Classroom: HP 50740A+24B On-Site: HP 50740A+24G

Course for: Engineers and Technicians working at RF & microwave band widths.

Learn the fundamentals of microwave transmission and energy, modulation and measurement of signals and devices in microwave frequency ranges.

Course Content:

- **Transmission Lines**
- **Power Measurements**
- **Amplitude Modulation**
- Angle Modulation
- Vector Modulation
- Network Analysis Fundamentals
- Vector Network Analysis
- Scalar Network Analysis
- Linearity
- **Spectrum Analysis**
- Modulation domain
- Noise
- Signal sources / Synthesisers

Prerequisites: A general understanding of electronic and measurement principles.



Microwave Uncertainty Measurement Course

Classroom: HP 50740A+24F On-Site: HP 50740A+24I

Course for: Metrologists responsible for complying with ISO metrology standards and Technicians and Engineers who take these measurements and perform the calculations.

Learn the process of performing uncertainty analyses of microwave measurements. Gain expertise in the field of metrology as applied to microwave measurements.

Course Content:

- Error and Uncertainty
- Calibration and Standards
- Traceability and Disturbance
- Conformity and Agreement in the Worldwide Measurement Community
- Meeting Compliance of New Standards
- Basic terms, concepts and definitions (CIPM method)
- International Committee for Weights and Measures
- Error Sources- Random Systematic
- Review of Statistical Analysis / Mathematical Methodology of CIPM
- Basic Power Measurement Test Ensemble
- Calculate the Uncertainty

Prerequisites:

Course HP 50740A+24B or equivalent experience. Students should also bring a scientific calculator suitable for statistics.

Duration: 3 days

Additional courses available

EMC Pre-Compliance Workshop

Classroom: HP 85712D+24B On-Site: HP 85712D+24G

Automatic Measurements with Spectrum Analysers

Classroom: HP 8591E+24F On-Site: HP 8591E+24I

Vector Modulation Measurements

Classroom: HP 89440A+24B On-Site: HP 89440A+24G

RF & Microwave Measurements

Classroom: HP 50740B+24B On-Site: HP 50740B+24G

RF and MW Instruments

and Systems



MDS: Basics

Classroom: HP 85150B+24D On-Site: HP 85150B+24I

Course for: All new users of HP high frequency design software.

Learn about the High Frequency Design System through interactive lectures and hands-on lab exercises.

Course Content:

- Design Capture System windows and the mouse
- Common Features of HFDS
- Building Circuits
- Simulation Control
- Presenting Results
- Datasets
- Labs
- Optimisation
- Lay-out
- Documenting Designs

Prerequisites: A basic understanding of circuit design and analysis is recommended.

Duration: 3 days

MDS: Active Circuit Simulation

Classroom: HP 85151A+ 24D On-Site: HP 85151A+ 24I

Course for: High-frequency circuit and system Designers and Engineers.

Learn the design and simulation of a low noise amplifier, a mixer and a simple oscillator as case studies. This course establishes the link between laboratory test-bench experiments and the HFDS software test bench.

Course Content:

- Linear and harmonic balance simulation for:
 - Amplifiers
 - Mixers
 - Oscillators
- Linear and nonlinear noise
- Optimisation
- Statistics
- Advanced post-processing

Prerequisites: HP 85150B+24D or equivalent experience is recommended.

Using HP Momentum with MDS

Classroom: HP 85158A+ 24B On-Site: HP 85158A+ 24I

Course for: All new users of HP Momentum and existing users of HP Microwave Design Systems.

This course gives an overview and handson application of the HP Momentum software for problem solving.

Course Content:

- Basics of HP Momentum
- Software features
- Inputs from layout or schematic
- Vias and layers
- Substrate databases
- Control meshing for accuracy and performance
- S-Parameters and current distribution
- Application of software to various structures

Prerequisites: Course HP 85150B+ 24D or relevant experience using HFDS or RFDS products.

Duration: 2 days

NEW

High Frequency Structure Simulator

Classroom: HP 85180A+24B On-Site: HP 85180A+24G

Course for: Electrical Engineers involved in the design of RF and microwave high-frequency circuits.

Gain start-to-finish knowledge of HFSS, including how to draw solid models, solve for s-parameters, and analyse and visualise results.

Course Content :

- Set up and draw geometric models
- Define ports and surfaces for geometric models
- Solve problems for single frequency points
- Examine frequency sweeps
- View s-parameter results and calculate port impedances
- Present results in various graphic forms

Prerequisites: Familiarity with basic circuit design and analysis, and at least an introductory knowledge of electromagnetic theory.





Series IV: OmniSys for System Design

Classroom: HP E4604A+24D On-Site: HP E4604A+24G

Course for: Engineers , Technicians and Managers involved in the design and use of RF or microwave systems and subsystems.

Learn to generate complete system descriptions using block or schematic entry within the Project Design Environment.

Course Content:

- Project design management
- System description at any phase of the design cycle
- Flexible hardware modelling
- Swept parameter analysis
- Modulated signal sources
- Pseudo-random data sources and baseband data processing
- Swept frequency and power measurements
- Component-specific budget analysis
- Mixer spurious analysis
- Modulation and signal-processing simulations
- Estimation of error probability (BER)
- Noise modelling and analysis
- Modeling of gain control (AGC) loops
- Tuning and optimisation
- System yield estimation, sensitivity analysis, and yield optimisation
- Post-production tuning
- Sim Link[™] integration of circuit system simulation

Prerequisites: Familiarity with basic RF or microwave system concepts and terminology.

Duration: 5 days

Series IV: Libra/J-Omega for Circuit Design

Classroom: HP E4602A+24B On-Site: HP E4602A+24G

Course for: Electrical Engineers involved in the design, analysis and layout of linear and non-linear RF and microwave and high frequency analogue circuits.

Learn to generate a complete RF and microwave circuit design from basic schematic entry through final circuit analysis using the Project Design Environment.

Course Content:

- Project design management
- Schematic entry
- Manipulating simulation results
- Harmonic-balance analysis
- Standard and user-defined linear and nonlinear measurements
- DC measurements
- Interactive tuning
- Power amplifier design and analysis
- Nonlinear simulation and analysis of an oscillator
- Mixer analysis and intermodulation distortion measurements
- Yield and sensitivity analysis
- Yield optimisation
- Parametric subnetworks
- Swept parameter analysis
- Introduction to layout

Prerequisites: Familiarity with basic RF and microwave concepts and circuit design techniques.

Series IV: CDS for Board Level Design

Classroom: HP E4605A+24D On-Site: HP E4605A+24G

Course for: Engineers, Technicians and Managers involved in the design and use of board-level RF or microwave systems and subsystems.

Learn to generate complete board-level descriptions using block/schematic entry within the Project Design Environment.

Course Content:

- Schematic entry
- Manipulating simulation results
- Harmonic-balance analysis
- Standard and user-defined linear and nonlinear circuit and system measurements
- DC measurements
- Power amplifier design and analysis
- Oscillator design and analysis
- Mixer circuit-level analysis and intermodulation distortion measurements
- Parametric subnetworks
- Swept parameter analysis
- Modulated signal sources
- Pseudo-random data sources and baseband data processing
- System component-specific budget analysis
- Mixer spurious analysis
- Discrete time analysis tools for RF envelope, baseband and DSP analysis
- PCB layout
- SMT, RF IC and RF element libraries
- Design for manufacturing

Prerequisites: Familiarity with basic board-level RF or microwave system and circuit concepts and terminology.

Duration: 5 days



Series IV : Physical Design and Customisation

Classroom: HP E4671A+24D On-Site: HP E4671A+24G

Course for : Experienced Series IV users interested in detailed instruction on advanced layout features and customisation of the Project Design Environment.

Improve your use of Series IV software by learning advanced graphical techniques, customisation of the user interface, and use of the Application Extension Language (AEL).

Course Content:

- Customisation of the Project Design Environment
- Customisation of layer sets
- Advanced graphical editing techniques
- Import and export of other graphical file standards
- Layout and schematic design synchronisation
- Fixed, scaleable and macro artwork items
- Use of AEL
- Creation and editing of wires, traces and paths
- Creation of a complete schematic layout using design synchronisation

Prerequisites: Completion of one HP circuit design class; or experience with, and thorough understanding of, basic Series IV layout features.



RF & MW Design Solutions





Using HP Momentum with Series IV

Classroom: HP 4665A+24B On-Site: HP 4665A+24G

Course for: All new users of HP Momentum and existing users of HP Microwave Design Systems.

This course gives an overview and handson application of the HP Momentum software for problem solving.

Course Content:

- Basics of HP Momentum
- Software features
- Inputs from layout or schematic
- Vias and layers
- Substrate databases
- Control meshing for accuracy and performance
- S-Parameters and current distribution
- Application of software to various structures

Prerequisites: Course HP 85150B+24D or relevant experience using HFDS or RFDS products.

Duration: 2 days

Additional courses available

IC-CAP User Training

On-Site: HP 85190A+24G

NEW

Introduction to AEL Programming



Circuit Envelope Simulation

Network Analysis Measurements

Classroom: HP 8753C+24B On-Site: HP 8753C+24G

Course for: Engineers and Technicians who are using or planning to use Network Analysers.

Learn to perform accurate Network Analysis measurements:

Course Content:

- Concepts of Network Analysis
- S-Parameters and Flow Chart
- Vector Network Analyser Block Diagram
- Signal Divide Devices
- Amplitude, Phase and Group Delay Measurements
- Error Identification and Calibration
- Time Domain Measurements
- Antenna Measurements
- Scalar Network Analysers
- AC/DC Detection
- Uncertainty and Calibration

Prerequisites: None.

Duration: 1 day

Using Vector Network Analysers HP 87XX

Classroom: HP 8753C+24E On-Site: HP 8753C+24H

Course for: Present and future HP 87xx users.

Learn to identify error sources and to use different calibration types. Also how to use the HP 87xx to maximise its measurement performance.

Course Content:

- Vector Network Analysis Review
- Test Set Block Diagram for HP 87xx
- HP 87xx Functions
- Measurement Sequence
- Calibration of HP 87xx
- Time domain measurements with HP 87xx

Prerequisites:

Course HP 8753C+24B or similar knowledge .

Duration: 1 day

Component Test Systems

Network Measurements using the HP 8510

Classroom: HP 8510C+24B On-Site: HP 8510C+24G

Course for: Test Engineers and Technicians.

Learn how to operate the HP 8510 network analyser to maximise performance for your application.

Prerequisites: An understanding of vector representation of a microwave signal and basic measurement concepts and terminology. Network measurements with HP 87xx.

Duration: 3 days

HP 3048A Phase Noise Measurement System Course

Classroom: HP 3048A+24B On-Site: HP 3048A+24G

Course for: HP 3048A operators.

Develop the skills necessary to make phase noise and AM noise measurements on signal sources and two-port devices using the HP 3048A phase noise measurement system.

Prerequisites:

Courses HP 8591E+ 24B or HP 50740A+ 24B, and DOS basics or similar knowledge.

Duration: 3 days

Noise Figure Measurements

Classroom: HP 8970B+24B On-Site: HP 8970B+24G

Course for: Engineers and Technicians of RF and microwave device and receiver manufacturers.

Learn the fundamentals of noise characterisation, best measurement practices and solve some real world problems.

Prerequisites: A general understanding of electronic and measurement principles.



Additional courses available

Advanced Programming of the HP 8510

Classroom: HP 8510C+24E On-Site: HP 8510C+24H

Time Domain Network Measurements

Classroom: HP 8510C+24F On-Site: HP 8510C+24I

Understanding Connectors used with a Network Analyser

Classroom: HP 85050A+24B On-Site: HP 85050A+24G

Impedance Measurement Fundamentals

Classroom: HP 4284A+24B On-Site: HP 4284A+24G

Advanced Impedance Testing

On-Site: HP 4284A+ 24H

Component Test Systems

For further information contact your local Customer Education Representative

Logic Analysis Fundamentals

Classroom: HP 16500B+24B On-Site: HP 16500B+24G

Course for: Engineers and Technicians

Learn the difference between State and Timing, selecting the correct logic analyser tools and creating a debug process to quickly locate the cause of a problem.

Course Content:

- Introduction to Logic Analysis
- The Time/State Analysis
- Stimulus/Response Testing
- Time Violations
- Software Debug
- Intermittent Problems

Prerequisites: None.

Duration: 1 day

Microprocessor SW Development System Training

Classroom: HP 64700T+24B On-Site: HP 64700T+24G

Course for: Engineers and Technicians

Learn the fundamentals of emulation and analysis, HP 64700 environment and obtain a detailed overview of the graphical motif interface.

Course Content:

- Emulation Fundamentals
- Analysis Fundamentals
- HP 64700 Hardware and Software
- User Interface Comparison
- System Functions
- Emulator Configuration
- Processor Specific Topics
- Basic Emulator Commands
- Emulation Bus Analyser
- X-Resources

Prerequisites: Familiarity with X-Windows, HP-UX and a HP-UX editor.

Duration: 2 days



For further information contact your local Customer Education Representative



Optical Spectrum Analysers User Training

Classroom: HP 71450B+24B On-Site: HP 71450B+24G

Course for: Engineers and Technicians using optical spectrum analysers

Learn efficiency and familiarity with instruments. Make proof-ofperformance measurements.

Course Content:

- Introduction to the Optical Spectrum Analyzer
 - Block diagrams
 - Keys, Display and Menus
- Basic Functions and Operation
 - Wavelenght
 - Amplitude
 - User Calibration
- Application (as time allows), presently there are:
 - Source Measurements
 - HP71451 Modes
 - Stimulus Response
 - EDFA
 - Polarization Dependent Loss (PDL)
 - LUSS (I DL)

Prerequisites: Some experience in general Lightwave measurements.

Duration: 1 day

Additional courses available

Lightwave Measurement Fundamentals

Classroom: HP 50740B+24E On-Site: HP 50740B+24H



HP Netmetrix User Course For Unix Environment

Classroom: HP J2508A+24D On-Site: HP J2508A+24G

Course for : Private network Managers for LAN network installation and maintenance

Learn how to effectively use HP NetMetrix and how it can help in network management.

Course Content:

- Installation and configuration
- RMON
- Load monitoring
- NFS monitoring
- Protocol analysis
- Internetwork monitoring
- Traffic generation

Prerequisites: A working knowledge of the UNIX operating system.

Duration:2 days

HP Netmetrix User Course For Windows

Classroom: HP 4988A+ 24B On-Site: HP 4988A+ 24G

Course for: Private network Managers for LANs, Network Administrators, network installation and maintenance

Learn to install, configure, trouble shoot and use Lanprobes, HP Netmetrix for Windows

Prerequisites: A working knowledge of DOS 5.0 and Windows 3.1. LAN networking experience would be helpful.

Duration: 2 days

NEW

HP Ethernet/Internet Advisor User Certification Course

Classroom: HP J2522B+24B On-Site: HP J2522B+24G

Course for: Engineers and Technicians working on maintenance for LAN ethernet networks

Learn the basic strategy for troubleshooting Ethernet LAN Network problems using the HP Internet Advisor.

Course Content:

- Setting up the Internet Advisor
- Using Filters
- Using Node List/Discovery
- Using Statistics
- Using Canned Tests
- Using Commentators
- Using Vital Signs
- Using Traffic Generators

Prerequisites: Networking experience is helpful.

Duration: 1 day

Felecom/Datacom



HP Wan Internet Advisor User Certification

Classroom: HP J2302B+24B On-Site: HP J2302B+24G

Course for: WAN Network troubleshooters working from 64KB/s to 2MB/s

Learn to use all the measurement features of the HP J230X to assist you in isolating WAN problems quickly.

Course Content:

- Toolkit description and utilisation
- Analyser setup
- High speed capture mode
- "View data file" application
- Bit error rate analysis: BERT

Prerequisites: Basic knowledge of WAN would be helpful. Student should bring their own analyser.

Duration: 1 day



TTCN Training Course on Broadband Tester

Classroom: HP E3910C+24E On-Site: HP E3910C+24H

Course for: People involved in writing specific conformance test suites or in modifying official TTCN conformance test suites.

Understand TTCN language using BSTS platform.

Course Content:

- Introduction to protocol testing
- ISO 9646 methodology
- TTCN notation
- ATS development
- TTCN editor
- Telecom protocol test manager on BSTS
- Overview of TTCN translator and libraries
- Testsuite loader file
- ETS implementation process
- C source code generated
- Support code and custom files

Prerequisites: Some experience in C language, UNIX and broadband testing is necessary.

Duration: 5 days

Telecom/Datacom



Classroom: HP E4210B+24B On-Site: HP E4210B+24G

Course for: IT Managers and Network Managers

Understand the technical benefits and economical impact of the new ATM technology.

Course Content:

- LAN networks trends
- WAN networks evolution
- Basic ATM concept
- Public services on ATM
- ATM in LAN networks
- LAN emulation
- IP over ATM
- ATM in the workstations
- ATM deployment

Prerequisites: Networking and telecommunication basics

Duration: 1 day

Broadband ISDN User Training

Classroom: HP E4200A+24E On-Site: HP E4200A+24H

Course for: New users of broadband ISDN testers

Learn how to use a B-ISDN tester. Understand configuring triggers and filters on the broadband tester, capturing data, monitoring, generating traffic and simulating.

Prerequisites:

Course HP E4200A+24B or equivalent knowledge.

Duration: 2 days

Broadband ISDN Programming Training

Classroom: HP E4200A+24F On-Site: HP E4200A+24I

Course for: Users of Broadband ISDN testers who need to program the tester

Course Content:

- Module 1: User Programming Environment
 - UPE Introduction
 - Getting Started
 - Writing Test Programs
- Module 2: Introduction to LIF Programming Programming the 34Mb/s E3 LIF Module

Prerequisites:

Course HP E4200A+24B and HP E4200A+24E or similar knowledge.

Duration: 2 days

23

Telecom/Datacom



Broadband Internetwork Analyser User training

Classroom: HP E5200A+24B On-Site: HP E5200A+24G

Course for: Engineers and Technicians working on maintenance of ATM networks

Learn efficiency and familiarity with the analyser. Make proof-of-performance measurements.

Course Content:

- System overview
- Configuration and connections
- Basic initialisation and login
- On-line help system
- Link monitor
- Channel monitor
- Smarttests
- Capture system
- Traffic simulation
- Alarm and error simulation
- Statistics logging

Prerequisites: A good understanding of ATM technology and ATM networks

Duration: 1 day

Additional courses available

Operating HP 37900D

Classroom: HP 37900D+24B On-Site: HP 37900D+24G

NEW

HP Token Ring Internet Advisor User Certification Course

Classroom: HP J2523B+24B On-Site: HP J2523B+24G

NEW

HP FDDI Internet Advisor User Certification Course

Classroom: HP J2524A+24B On-Site: HP J2524A+24G

HP WAN Internet Advisor: Low Speed User Course

Classroom: HP J2300A+ 24B On-Site: HP J2300A+ 24G

TTCN Training Course on PT500

Classroom: HP E3910C+24B On-Site: HP E3910C+24G

ATM/Broadband ISDN Technology and Testing

Classroom: HP E4200A+24B On-Site: HP E4200A+24G

SDH Fundamentals

Classroom: HP 37724A+24B On-Site: HP 37724A+24G

HP 3771X User Training

Classroom: HP 37717A+24B On-Site: HP 37717A+24G



GSM Radio Measurements

Classroom: HP 85715A+24B On-Site: HP 85715A+24G

Course for : Engineers and Technicians of developers, manufacturers, operators and service providers of GSM base stations

Learn measurements of the main characteristics of a GSM transmitter.

Course Content:

- Digital communication system overview
- GSM system basic description.
- Characteristics of a GSM transmitter.
- Measurement fundamentals with a spectrum analyser.
- Application: Using an HP 859X Spectrum Analyser with the GSM HP 85715A/B software for GSM transmitter measurements.

Prerequisites : A background knowledge in communications engineering is assumed.

Duration: 1 day

NEW

Cellullar System Basics

Classroom: HP 50740A+24E On-Site: HP 50740A+24H

Course for: Engineers and Technicians of developers, manufacturers, operators, and service providers of Base stations and Terminals for Cellullar Systems.

Learn the fundamentals of analogue and digital cellular radio systems and testing techniques.

Course Content:

- Analogue Cellular Fundamentals
- **TACS System Fundamentals**
- Other Analogue standards
- Testing of Analogue Cellular Systems
- Digital Cellular System Fundamentals
- GSM System Fundamentals
- Other Digital Cellular Standards
- Testing of Digital Cellular Systems

Prerequisites: Basic understanding of fundamental electronic principles and an understanding of general analogue measurement principles would be beneficial *OF*,

HP's Microwave Measurements Course.



Additional courses available

Digital Mobile Communications

Classroom: HP 8922G+24B On-site: HP 8922G+24G

GSM Mobile Telephone Test Techniques

Classroom: HP 8922H+24B On-site: HP 8922H+24G



Communications Wireless



CATV Measurements

Classroom: HP 85711A+24B On-Site: HP 85711A+24G

Course for: Cable television Technicians and Engineers who have experience with system and head-end measurements

Learn to make proof-of-performance measurements with a Spectrum Analyser at the head-end or in the field. Make routine measurements for system compliance or troubleshooting.

Course content:

- Head-end Measurements
 - Measuring the vision carrier
 - Sound carrier and other relative carriers
 - In-channel frequency response
 - System sweep
 - Carrier to noise measurements
- System Measurements
 - Composite triple beat
 - Cross modulation
 - Hum
 - Depth of modulation
 - FM deviation
 - Co-channel, adjacent channel and ingress interference

Prerequisites: Experience with system and head-end measurements. Spectrum analysis measurements (HP 8591E+24B) or equivalent.

HP 82000 User Training

Classroom: HP E1288A+24D On-Site: HP E1288A+24G

Course for: Users of the IC-Test System HP 82000

Learn to use the HP 82000 system to perform digital integrated circuit evaluation.

Course Content:

- Hardware overview
- System software overview
- Setting up a functional test
- Debugging a functional test
- Sequencer programming
- Generation of test programs in BASIC and C
- High speed testing
- System calibration
- Links to EDA (CAE) systems

Prerequisites: Practical experience in digital techniques and preferably in programming.

Duration: 5 days

HP83000 F330 System Training Part 1

Classroom: HP E2823A+24D On-Site: HP E2823A+24G

Course for: Engineers responsible for IC characterisation, evaluation, failure mode analysis and for the development of production test programs

After completing this training, you will be able to make competent use of specifications. You will learn all the steps in how to setup a device and analyse the results. You will be able to develop a testprogram for the production test floor.

Course Content:

- Hardware and Software Overview
- Diagnostics and Calibration
- Setup Editors
- AC and DC Test Functions
- Sequencer Programming
- ASCII Translator
- Testflows
- Throughput Optimisation
- Production Test Programs
- Workorder Management

Prerequisites: Familiarity with methodologies of digital IC test and UNIX (HP-UX)

Duration: 5 days

Semiconductor Test

HP83000 F330 System Training Part 2

Classroom: HP E2824A+24D On-Site: HP E2824A+24G

Course for: Engineers responsible for IC characterisation, evaluation, failure mode analysis and for the development of production test programs

You will learn how to test complex devices. You will learn to use advanced features of the HP83000 Test System in order to decrease test time and test development time.

Course Content:

- Deep understanding of the Timing System
- Multi Mode Setups
- FW commands
- Advanced ASCII Translator Usage
- Equation Based Testing
- Writing User Procedures and Testflows in C
- Multi Site Testing

Prerequisites: Participation on 'HP83000 F330 System Training Part 1', Familiarity with Methodologies of digital IC test, with UNIX, C programming

Recommendation: It is recommended that the Part 2 of the 'F330 System Training' be taken 2-4 weeks after Part 1 to gain real life experience on the F330 Test System.

Duration: 5 days

HP 947x User Training

Classroom: HP E3811B+24D On-Site: HP E3811B+24H

Course for: HP 947x users

Become proficient at operating and developing user-specific application programs for the HP 947x test system.

Course Content:

- System hardware and software overview.
- Development of test functions for the smart power test
- Generation and execution of programs for the function test.
- Data-analysis.
- Practical exercises.
- System calibration.

Prerequisites: Basic knowledge in programming with C and knowledge of MS-DOS. Basics of smart power DC-tests.



Additional courses available

HP 83000 F660 User Training

Classroom: HP E2820B+24D On-Site: HP E2820B+24G

HP 947x Advanced User Training

Classroom: HP E3811B+24P On-Site: HP E3811B+24G

HP 949x User Training

Classroom: HP 3001A+24B On-Site: HP 3001A+24G

HP 4062UX Operating and Programming Training

Classroom: HP 4062UX+24B On-Site: HP 4062UX+24G

NEW

ICMS User Training

Classroom: HP E3330A+24B On-Site: HP E3330A+24G



HP 4062 UX System Administrator

Classroom: HP 4062UX+24E On-Site: HP 4062UX+24H NEW

VK Test System User and Programmer Training

Classroom: HP E7082A+24D

NEW

VK Test System Advanced Programmer Training Classroom: HP E7082A+ 24P

HP 83000 F80/120/330t Service Training

Classroom: HP E2757A

HP 947x Service Training

Classroom: HP E3811B+24M



HP 4062 UX Maintenance Training



HP 3070 Family Fundamentals Training

Classroom: HP E1031A On-Site: HP E1031A+24G

Course for: Engineers and Technicians

Gain an understanding in the basics of the HP test philosophy and the process of developing test programs for the HP 3070 test system.

Course Content:

- HP Test-Consultant
- Developing Test programs
- Data Capture
- Testing of digital and analogue components
- Debugging
- Fixturing
- Quality Management
- System Administration
- Test Jet

Manufacturing Test

31

Prerequisites: Basic knowledge of analogue and digital electronics, programming, and HP-UX.

Duration: 10 days

HP 3070 Family Advanced Applications

Classroom: HP E1031A+24E On-Site: HP E1031A+24H

Course for: HP 3070 users

Improve basic knowledge to solve specific problems in testing and use the HP 3070 more effectively. After the course you will save up to 30% of the time in developing test programs and in testing.

Course Content:

Some of the topics can be defined with you at the beginning of the class.

- How to write a stable program very quickly by using
 - Pushbutton Debug
 - Pusbutton QSTATS to debug all measurements
 - Board Grading
- Digital Test
 - Pushbutton Debug
 - Controlling and triggering an oscilloscope
 - Developing macros
 - Storing of tests results into a SRAM during the testplan
- Analog Functional Test
 - Arbitrary Waveform Generator
 - Digitiser
 Mixed Signal Test
- Connecting peripherals
- Effective use of the Access Plus Board
- Specific HP 3070 System Management
- Board Grading
- Boundary scan
- Limitations of analog in-circuit tests

Prerequisites: HP 3070 User Training (HP E1031A). Six months experience in programming or experience in programming and debugging of at least two boards.



Programming the HP 3079CT Board Test System with the POTS Option

Classroom: HP E1085A+24D On-Site: HP E1085A+24G

Course for: Test Engineers and Test Programmers using the HP 3079CT Board Test System with the POTS option.

Learn to test POTS line cards using the Serial Test Language and POTS virtual instrument commands

Course content:

- Fundamentals of analogue telecommunications
- Structure of the POTS Hardware
- Structure of an analog test
- Triggering of the serial Testcard with the POTS hardware
- The Setup of a test programme for an analog Telecom Board

Prerequisites: Course HP E1096A (STC) or equivalent. Knowledge of the boards to be tested.

Duration: 5 days

Programming with HP Serial Test Language on HP 3709CT

Classroom: HP E1096A+ 24D On-Site: HP E1096A+ 24G

Course for: All users of the HP 3079CT system

Learn to use the HP 3079CT system for line card testing. The student should also be able to use this knowledge to test other boards with serial interfaces. This course will help to significantly improve the test throughput and reduce the complexity of digital serial testing and analogue line card testing.

Course Content:

- Introduction to telecommunications
- Serial Test Structure
- Serial Test Setup
 - Clocks
 - Streams
 - Substreams
 - Constants
 - Process
- Filters
- Introduction to ISDN

Prerequisites: HP 3070 User Training (HP E1031A) and a few months experience in programming and testing.





HP3070 Family Boundary Scan Concepts and Applications Training

Classroom: HP E1031A+24F On-Site: HP E1031A+24I

Course for: Engineers and Technicians using board testers.

Develop an understanding of a powerful technology that provides an alternative solution for development of complex devices test routines and a methodology to deal with limited access test challenges.

Course Content:

- Concepts of boundary scan technology
- "Test Access Port" architecture
- Structure of the boundary cell
- BSDL language
- Interconnect test suite
- Runbist and Intest

Prerequisites: Course HP E1031A or equivalent knowledge, and several months experience

Duration: 3 days



HP3070 Family System Administrator

Classroom: HP E3749C On-Site: HP E3749C+24G

Course for: Engineers and Technicians using board testers and who want to understand HP-UX related to HP3X7X.

Learn the essentials necessary to successfully manage the HP 3070 Family of board test systems.

Course Content:

- How to add new users, system hardware and peripherals
- How to do startup and shutdown
- System back-up
- BT-BASIC commands to HP-UX
- System management tools
- How to add printer, terminal, disk, X station.

Prerequisites: None





5 DX Programmers Training

Classroom: HP E7255A+24B On-Site: HP E7255A+24G

Course for: Engineers and Technicians who are responsible for the operation and for the test program development for the HP Four Pi 5DX-System.

Understand the fundamental technical characteristics of the cross-sectional X-ray system.

Course Content:

- Structure of the system
- Theory of operation of the X-ray laminography
- Monitor Icons
- Auto UI
- CAD Link
- Alignment: Basic idea
- Surface Map
- Calibriation
- Algorithms
- Testprogram development
- Debugging

Prerequisites: Experience in using a PC (Windows and MS-DOS).

Duration: 8 days

NEW

5 DX Operators Training

Classroom: HP E7255A+24E On-Site: HP E7255A+24H

Course for: Engineers and Technicians who are responsible for the HP Four Pi 5DX-System.

Understand the fundamental technical characteristics and be able to take care of the operation of the system.

Course Content:

- Structure of the system
- The PC Environment
- Monitor Icons
- Auto UI
- CAD Link
- Alignment: Basic idea
- Surface Map
- Calibriation
- Short introduction into algorithms
- Debugging
- Paperless Repair
- SPC Link
- Additional topics on demand

Prerequisites: Experience in using a PC (Windows and MS-DOS).



Additional courses available

HP 3070 Family Advanced Digital Training

Classroom: HP E1024A On-Site: HP E1024A+24G

Statistical Process Control Training Course

Classroom: HP E1089A+24B On-Site: HP E1089A+24G

HP 3065 User Training

Classroom: HP 3065+24B On-Site: HP 3065+24G

HP 3065 Advanced User Training

Classroom: HP 3065+24E On-Site: HP 3065+24H



For further information contact your local Customer Education Representative

The following and additional courses regarding operating systems, System Administration, programming languages and networking can be ordered at our collegues in the IT Customer Education Centers. For more information please call your local Education Center:

NEW

HP-RT Fundamentals & Driver Writing

Classroom: HP B3800AA+24B On-site: HP B3800AA+24G **UNIX System Basics I &II**

HP-UX System Administration for Application Users

Fundamentals of the UNIX System

ANSI C Programming Course

Deen Systems, Unix, HP-UX and Networking

HP Course Subject Index

SECTION 1 – Test System Products and Development Tools

Number	Course Title	Page	
HP 98880A+24F	Standard Instrument Control Library (SICL) for Instrument Programmers	1	
HP E2110B+24B	Introduction to HP VEE-TEST	1	
HP E2110C+24B	Advanced HP VEE Test	0	
HP E1300A+24B	Introduction to VXIbus	2	
HP E1401A+24E	Advanced VXI/Embedded Controller		
HP 98616B+24B	Programming with HP BASIC		
HP 98616B+24E	Programming Instrumentation with HP BASIC	2	
HP 98880A+24B	HP BASIC/UX Programming and Operating course	3	
HP E2110B+24E	Developing Drivers for HP VEE-TEST		
HP E1401A+24B	VXIbus Technology		
HP 44638A+24B	TestExec SL		

SECTION 2 – Mechanical and Physical Test Instruments

HP 35665A+24B	FFT Measurements	4
HP 35665A+24E	HP 35670 Dynamic Signal Analyzer Course	4
HP B2773A+24B	RTAP/Plus Integration	5
HP B2773A+24E	RTAP/Plus Programming	5
HP 35670A+24B	Control System Measurements	
HP 35635R+24B	HP 3565S Toolkit Course	
HP 35670A+24E	Structure Analysis Measurements	
HP 35670A+24F	Rotating Machinery Measurements	6
HP 3569A+24B	Acoustic Application Seminar	0
HP 3562A+24B	HP 3562A Dynamic Signal Analyser Course	
HP 35635T+24B	VXI Toolkit Course	
HP 3852A+24B	HP 3852S User Training	

SECTION 3 - RF and MW Instruments and Systems

HP 11949A+24B	Introduction to EMC and Regulations	
HP 11949A+24E	EMC Design Course	7
HP 11949A+24F	EMI Measurements According To European Norms	
HP 8591E+24B	Spectrum Analysis Measurements	8
HP 8591E+24E	Using Spectrum Analysers HP 859X and HP 856X	
HP 89440A+24E	HP 89410A/89440A Vector Signal Analyser Course	0
HP 50740A+24B	RF & Microwave Measurements	9
HP 50740A+24F	Microwave Uncertainty Measurement Course	
HP 85712D+24B	EMC Pre-Compliance Workshop	
HP 8591E+24F	Automatic Measurements with Spectrum Analysers	10
HP 89440A+24B	Vector Modulation Measurements	
HP 50740B+24B	RF & Microwave Measurements	

SECTION 4 - RF and MW Design Solutions

HP 85150B+24D	MDS: Basics	11	
HP 85151A+24D	MDS: Active Circuit Simulation	11	
HP 85158A+24B	Using HP Momentum with MDS	12	
HP 85180A+24B	High Frequency Structure Simulator		
HP E4604A+24D	Series IV: OmniSys for System Design	12	
HP E4602A+24B	Series IV: Libra/J-Omega for Circuit Design	13	
HP E4605A+24D	Series IV: CDS for Board Level Design	14	
HP E4671A+24D	Series IV : Physical Design and Customisation	14	
HP 4665A+24B	Using HP Momentum with Series IV		
HP 85190A+24G	IC-CAP User Training	15	
	Introduction to AEL Programming	15	
	Circuit Envelope Simulation		

SECTION 5 – Component Test Systems

HP 8753C+24B	Network Analysis Measurements	16
HP 8753C+24E	Using Vector Network Analysers HP 87XX	10
HP 8510C+24B	Network Measurements using the HP 8510	
HP 8970B+24B	Noise Figure Measurements	17
HP 3048A+24B	HP 3048A Phase Noise Measurement System Course	
HP 8510C+24E	Advanced Programming of the HP 8510	
HP 8510C+24F	Time Domain Network Measurements	
HP 85050A+24B	Understanding Connectors used with a Network Analyser	18
HP 4284A+24B	Impedance Measurement Fundamentals	
HP 4284A+24H	Advanced Impedance Testing	

SECTION 6 - Digital Design and Test

HP 16500B+24B	Logic Analysis Fundamentals	10
HP 64700T+24B	Microprocessor SW Development System Training	19

SECTION 7 – Lightwave

HP 71450B+24B	Optical Spectrum Analysers User Training	20
HP 50740B+24E	Lightwave Measurement Fundamentals	20

SECTION 8 – Telecom/Datacom

HP J2508A+24D	HP Netmetrix User Course For Unix Environment	
HP 4988A+24B	HP Netmetrix User Course For Windows	21
HP J2522B+24B	HP Ethernet/Internet Advisor User Certification Course	
HP J2302B+24B	HP Wan Internet Advisor User Certification	<u> </u>
HP E3910C+24E	TTCN Training Course on Broadband Tester	22
HP E4210B+24B	ATM in Corporate Networks	
HP E4200A+24E	Broadband ISDN User Training	23
HP E4200A+24F	Broadband ISDN Programming Training	
HP E5200A+24B	Broadband Internetwork Analyser User training	
HP 37900D+24B	Operating HP 37900D	
HP J2523B+24B	HP Token Ring Internet Advisor User Certification Course	
HP J2524A+24B	HP FDDI Internet Advisor User Certification Course	
HP J2300A+24B	HP WAN Internet Advisor: Low Speed User Course	24
HP E3910C+24B	TTCN Training Course on PT500	
HP E4200A+24B	ATM/Broadband ISDN Technology and Testing	
HP 37724A+24B	SDH Fundamentals	
HP 37717A+24B	HP 3771X User Training	

SECTION 9 – Wireless Communications

HP 85715A+24B	GSM Radio Measurements	95
HP 50740A+24E	Cellullar System Basics	25
HP 8922G+24B	Digital Mobile Communications	96
HP 8922H+24B	GSM Mobile Telephone Test Techniques	20

27

SECTION 10 - Cable and Broadcast Television

HP 8	35711A+24B	CATV	Measurements

SECTION 11 – Semiconductor Test

HP E1288A+24D	HP 82000 User Training	90
HP E2823A+24D	HP83000 F330 System Training Part 1	28
HP E2824A+24D	HP83000 F330 System Training Part 2	20
HP E3811B+24D	HP 947x User Training	29
HP E2820B+24D	HP 83000 F660 User Training	
HP E3811B+24P	HP 947x Advanced User Training	
HP 3001A+24B	HP 949x User Training	
HP 4062UX+24B	HP 4062UX Operating and Programming Training	
HP E3330A+24B	ICMS User Training	
HP 4062UX+24E	HP 4062 UX System Administrator	30
HP E7082A+24D	VK Test System User and Programmer Training	
HP E7082A+24P	VK Test System Advanced Programmer Training	
HP E2757A	HP 83000 F80/120/330t Service Training	
HP E3811B+24M	HP 947x Service Training	
	HP 4062 UX Maintenance Training	

SECTION 12 – Manufacturing Test

HP E1031A+24F	HP 3070 Family Fundamentals Training	31
HP E1031A+24E	HP 3070 Family Advanced Applications	
HP E1085A+24D	Programming the HP 3079CT Board Test System with the POTS Option	32
HP E1096A+24D	Programming with HP Serial Test Language on HP 3709CT	
HP E1031A+24F	HP3070 Family Boundary Scan Concepts and Applications Training	33
HP E3749C	HP3070 Family System Administrator	
HP E7255A+24B	5 DX Programmers Training	34
HP E7255A+24E	5 DX Operators Training	
HP E1024A	HP 3070 Family Advanced Digital Training	
HP E1089A+24B	Statistical Process Control Training Course	35
HP 3065+24B	HP 3065 User Training	
HP 3065+24E	HP 3065 Advanced User Training	

SECTION 13 - Open Systems, Unix, HP-UX and Networking

HP B3800AA+24B	HP-RT Fundamentals & Driver Writing	
	UNIX System Basics I &II	
	HP-UX System Administration for Application Users	36
	Fundamentals of the UNIX System	
	ANSI C Programming Course	

Windows is a trademark of Microsoft Corporation. UNIX is a registered trademark of AT & T Bell Laboratories.



Date subject to change © 1996 Hewlett-Packard Company Printed in EU 5965-3426EN