

WDM & OTN

Optical Switching & Routing

Modern optical technologies reach the Terabit range and revolutionize the network world. As a result, they offer network operators and their customers completely new options of application. For this purpose, the course at hand offers an inventory and shows development trends of state-of-the-art optical technologies. It discusses the major changes in the fields of optical fiber types, access, and backbone, as well as optical networks and network protection and gives a compact overview of the innovative potential of high-performance, optical technologies. Participants will acquire the know-how for the planning and operation of WDM networks and for the evaluation of the optical routing of IP traffic in optical networks.

Course Contents

- Optical Transmission and Interfaces
- Optical Fibers: SMF, DSF, NZ-DSF, DCM, and Application Scenarios
- Attenuation, Dispersion, and Dispersion Correction
- Application of Optical Repeaters, such as EDFA, RAMAN
- Inventory of Optical Technologies: 1G/10G-Ethernet, Solitones, WDM
- CWDM, DWDM, WWDM, and Application Scenarios
- Evaluation of the Technologies for Optical Switching: 2x2, AWG, FBG, Filters, Liquid Crystals, Holography, MEMS, MZI, Thermo-optics, VBG
- OADMs, Optical Switches and Optical Routers
- Optical Networks: Setup, Operation, Network Protection Mechanisms
- OTNs, Optical Transport Networks, for Protected Optical Transmission

In this course of the ExperTeach Networking series, each student will receive the comprehensive ExperTeach course documentation.

Target Group

The course addresses employees of the carriers, enterprise network operators, and Internet service providers. It also specifically addresses users of networks with high data volumes and traffic by providing an overview of the market situation and of the development trends.

Knowledge Prerequisites

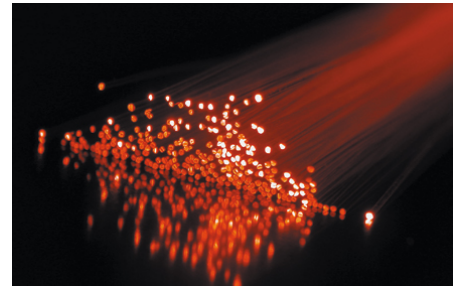
A profound knowledge of Synchronous Digital Hierarchy will facilitate the understanding of the course contents. Basic know-how of the optical transmission sector is also helpful.



Reservation and Registration

We will be glad to make a free and non-binding course reservation for you for the duration of two weeks. On www.experteach-training.com under *Registration*, you can conveniently make course reservations, registrations, and hotel reservations. Alternatively, call us under +49 6074 4868-0.

For closed groups of participants, we can modify the course contents according to your requirements. Do not hesitate to contact us!



4 days €1,995 exclusive of V.A.T.

Course date (mm/dd/yy)/Location

03/06-03/09/12	Hamburg	08/14-08/17/12	Hamburg
04/10-04/13/12	Frankfurt	09/24-09/27/12	Frankfurt
05/29-06/01/12	Düsseldorf	11/13-11/16/12	Düsseldorf
07/03-07/06/12	München	12/10-12/13/12	München
07/03-07/06/12	Wien	12/10-12/13/12	Wien

Up-to-date information: www.experteach-training.com OHSN



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WDM & OTN – Optical Switching & Routing

<p>1 And There Was Light</p> <p>1.1 The World Today—Growth and Limits</p> <p>1.1.1 Traffic Streams</p> <p>1.1.2 Technical Limitations</p> <p>1.2 Light—Interesting Facts about Fiber Optics</p> <p>1.2.1 Light and Light Propagation</p> <p>1.2.2 Attenuation and Optical Windows</p> <p>1.2.3 Dispersion</p> <p>1.2.4 Optical Interfaces</p> <p>1.2.5 Backscattering Measurement Using OTDR</p> <p>1.3 LASER—In the Focus of Interest</p> <p>1.3.1 Overview of Important LASER Types</p> <p>1.3.2 Tunable LASERS and their Application</p> <p>1.4 Optical Amplifiers—The Power of Light</p> <p>1.4.1 Rare Earth Elements for Common Use</p> <p>1.4.2 Application Examples</p> <p>2 Optical Transmission—High-Speed Technologies</p> <p>2.1 High-Speed in LANs and WANs</p> <p>2.1.1 Gigabit and 10 Gigabit Ethernet</p> <p>2.1.2 SDH with 10 and 40 Gbps</p> <p>2.2 Solitons—The Philosopher’s Stone?</p> <p>2.2.1 The Principle</p> <p>2.2.2 Successes and Disadvantages when Using Solitons</p> <p>2.3 DWDM—Principle and Technology</p> <p>2.3.1 Important Advantages</p> <p>2.3.2 Setup of a WDM Mux</p> <p>2.3.3 Channel Separation with DWDM</p> <p>2.3.4 An Insight into Measuring</p> <p>2.4 DWDM—Practical Application</p> <p>2.4.1 Connection to Routers</p> <p>2.4.2 Data Communications in the Campus Area</p> <p>2.4.3 DWDM in the LAN</p> <p>2.4.4 DWDM in the MAN</p> <p>2.4.5 Pros and Cons—Disadvantages of WDM</p> <p>2.5 The World of Optical Fibers</p> <p>2.5.1 Polymer Fibers—A Cost-Effective Alternative?</p> <p>2.5.2 Optical Fiber Types of the Metro and WAN Area</p> <p>2.5.3 The New Generation: Hollow Fiber</p> <p>2.5.4 Resumé: Who Uses Which Fiber?</p> <p>2.5.5 Network Optimization with Optical Fibers</p> <p>3 Optical Switching—A Wave Goes Its Way</p> <p>3.1 Optical Add/Drop Multiplexers (OADM)</p> <p>3.1.1 Application of OADMs</p> <p>3.1.2 Configurable OADMs</p> <p>3.2 Optical Cross-Connects</p> <p>3.2.1 Application Options</p> <p>3.2.2 Schematic Setup of Optical Cross-Connects</p>	<p>3.3 Optical Switches—Various Solutions</p> <p>3.3.1 MEMS—Technical Data</p> <p>3.3.2 Thermo-Optical Switches</p> <p>3.3.3 The Bubble Switch</p> <p>3.3.4 Liquid Crystal Switches</p> <p>3.4 Optical Routers</p> <p>3.4.1 Requirements</p> <p>3.4.2 Approaches</p> <p>3.4.3 Combined Solutions</p> <p>3.5 Optical Transport Networks (OTN) and Digital Wrapper</p> <p>4 Optical Networks—Wavelengths all over the World</p> <p>4.1 Optical Networks in Practical Application</p> <p>4.1.1 DWDM Networks</p> <p>4.1.2 Transparent Optical Networks—Wavelength Path Routing</p> <p>4.1.3 The Future—Virtual Wavelength Path Routing</p> <p>4.1.4 MPLS and Optical Networks</p> <p>4.1.5 Alone in the Dark? —Optical Protection Concepts</p> <p>4.1.6 Dedicated Protection</p> <p>4.1.7 Shared Protection</p> <p>4.1.8 Unidirectional and Bidirectional Rings</p> <p>4.1.9 MS Shared Protection</p> <p>4.1.10 All-Optical Protection Mechanisms</p> <p>4.1.11 Future World—Satellite Networks</p> <p>4.1.12 Heaven on Earth?</p> <p>4.1.13 Reading the Stars</p>
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