COURSE OVERVIEW IE0010

Practical Fiber Optics & Interfacing Techniques to Industrial Ethernet

Course Title

Practical Fiber Optics & Interfacing Techniques to Industrial Ethernet

Course Date/Venue

Session 1: May 12-16, 2025/Fujairah Meeting Room, Grand Millennium Al Wahda Hotel, Abu Dhabi, UAE

Session 2: November 02-06, 2025/Boardroom 1, Elite Byblos Hotel Al Barsha, Sheikh Zayed Road, Dubai, UAE

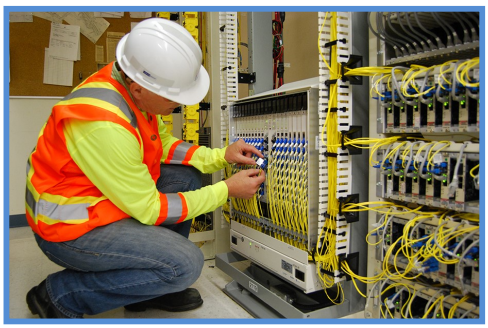
Course Reference

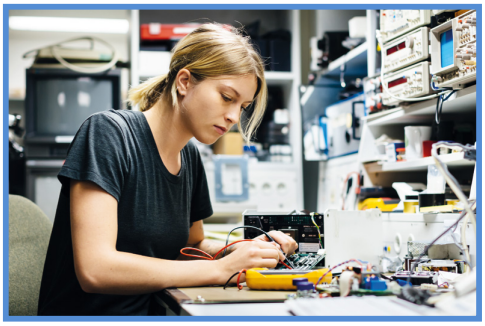
IE0010

Course Duration/Credits

Five days/3.0 CEUs/30 PDHs

Course Description





This practical and highly-interactive course includes practical sessions and exercises where participants carryout fiber optic splicing, testing and troubleshooting. Theory learnt in the class will be applied using our state-of-the-art equipment.

The rapidly changing face of data communications and telecommunications has seen a continued growth in the need to transfer enormous amounts of information across large distances. The technologies that were used extensively in the past such as coaxial cable, satellite and microwave radio for transferring information were running out of capacity. With the introduction of fiber optic communications systems, the solution to the problems of transmission capacity shortage and to noisy industrial environments has been successfully found.

Fiber optic transmission has become one of the most exciting and rapidly changing fields in telecommunications engineering. An optical fiber is simply a very thin piece of glass which acts as a pipe, through which light can pass. The light that is passed down the glass fiber can be turned on and off to represent digital information or it can be gradually changed in amplitude, frequency or phase to represent analog information.

Fiber optic transmission systems have many advantages over more conventional transmission systems. They are less affected by noise, do not conduct electricity and therefore provide electrical isolation, carry extremely high data transmission rates and carry data over very long distances. These and other advantages will be discussed in detail in this course.

Fiber optic transmission systems are not perfect and there are difficulties involved in designing, implementing, and operating fiber optic communications systems. This course is designed to provide a thorough background to fiber optic communications systems and to illustrate the design and installation of these systems. The many pitfalls associated with the implementation of fiber optic systems will be discussed and workable solutions to these problems will be provided in this course.

This course will provide an extensive overview of the construction, operation and applications of optical fiber, with more emphasis on installation and troubleshooting. The course will give both the novice and the experienced participant a solid grasp of the principles and practical implementation of fiber optic cabling for industrial applications.

Course Objectives

Upon the successful completion of this course, each participant will be able to:-

- Get certified as a "*Certified Fiber Optics Professional (CFOP)*"
- Apply state of the art fiber optics technology and installation practices
- Specify and describe fiber optic communications systems in total
- Gain **practical hands-on experience** in jointing, splicing and testing fiber optic systems and use correct procedures for cable installation and termination
- Recognize fiber optic termination patch panels and identify the various types of adapters and its merits/demerits
- Convert UTP ethernet to fiber optics and specify media converters
- Design and install a fully operational fiber optics system
- Implement the latest approaches in troubleshooting fiber optics

Exclusive Smart Training Kit - H-STK®

*Participants of this course will receive the exclusive "Haward Smart Training Kit" (**H-STK®**). The **H-STK®** consists of a comprehensive set of technical content which includes **electronic version** of the course materials conveniently saved in a **Tablet PC**.*

Who Should Attend

This course provides an overview of all significant aspects and considerations of practical fiber optics and interfacing techniques to industrial ethernet for engineers and other technical staff within instrumentation, control, communications, telecommunications, electrical and IT fields. This includes project, maintenance and consulting staff, systems and applications engineers.

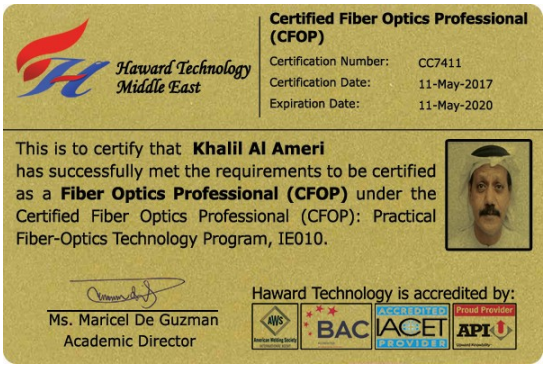
Course Certificate(s)

(1) Internationally recognized Competency Certificates and Plastic Wallet Cards will be issued to participants who completed a minimum of 80% of the total tuition hours and successfully passed the exam at the end of the course. Successful candidate will be certified as a "*Certified Fiber Optics Professional (CFOP)*". Certificates are valid for 5 years.

Recertification Fee is a FOC for a Lifetime.

Sample of Certificates

The following are samples of the certificates that will be awarded to course participants:



(2) Official Transcript of Records will be provided to the successful delegates with the equivalent number of ANSI/IACET accredited Continuing Education Units (CEUs) earned during the course.

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Haward Technology Middle East

Continuing Professional Development (HTME-CPD)

CEU Official Transcript of Records

TOR Issuance Date: 11-May-17

HTME No. PAR11317

Participant Name: Khalil Al Ameri

Program Ref.	Program Title	Program Date	No. of Contact Hours	CEU's
IE010	**Certified Fiber Optics Professional (CFOP): Practical Fiber-Optics Technology**	May 07-11, 2017	30	3.0

Total No. of CEU's Earned as of TOR Issuance Date **3.0**

TRUE COPY

Maricel De Guzman
Academic Director

Haward Technology has been approved as an Authorized Provider by the International Association for Continuing Education and Training (IACET), 1760 Old Meadow Road, Suite 500, McLean, VA 22102, USA. In obtaining this approval, Haward Technology has demonstrated that it complies with the ANSI/IACET 1-2013 Standard which is widely recognized as the standard of good practice internationally. As a result of their Authorized Provider membership status, Haward Technology is authorized to offer IACET CEUs for programs that qualify under the ANSI/IACET 1-2013 Standard.

Haward Technology's courses meet the professional certification and continuing education requirements for participants seeking Continuing Education Units (CEUs) in accordance with the rules & regulations of the International Association for Continuing Education & Training (IACET). IACET is an international authority that evaluates programs according to strict, research-based criteria and guidelines. The CEU is an internationally accepted uniform unit of measurement in qualified courses of continuing education.

Haward Technology is accredited by

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Certificate Accreditations

Certificates are accredited by the following international accreditation organizations: -

British Accreditation Council (BAC)

Haward Technology is accredited by the **British Accreditation Council** for **Independent Further and Higher Education** as an **International Centre**. BAC is the British accrediting body responsible for setting standards within independent further and higher education sector in the UK and overseas. As a BAC-accredited international centre, Haward Technology meets all of the international higher education criteria and standards set by B

- The International Accreditors for Continuing Education and Training (IACET - USA)

Haward Technology is an Authorized Training Provider by the International Accreditors for Continuing Education and Training (IACET), 2201 Cooperative Way, Suite 600, Herndon, VA 20171, USA. In obtaining this authority, Haward Technology has demonstrated that it complies with the **ANSI/IACET 2018-1 Standard** which is widely recognized as the standard of good practice internationally. As a result of our Authorized Provider membership status, Haward Technology is authorized to offer IACET CEUs for its programs that qualify under the **ANSI/IACET 2018-1 Standard**.

Haward Technology's courses meet the professional certification and continuing education requirements for participants seeking **Continuing Education Units** (CEUs) in accordance with the rules & regulations of the International Accreditors for Continuing Education & Training (IACET). IACET is an international authority that evaluates programs according to strict, research-based criteria and guidelines. The CEU is an internationally accepted uniform unit of measurement in qualified courses of continuing education.

Haward Technology Middle East will award **3.0 CEUs** (Continuing Education Units) or **30 PDHs** (Professional Development Hours) for participants who completed the total tuition hours of this program. One CEU is equivalent to ten Professional Development Hours (PDHs) or ten contact hours of the participation in and completion of Haward Technology programs. A permanent record of a participant's involvement and awarding of CEU will be maintained by Haward Technology. Haward Technology will provide a copy of the participant's CEU and PDH Transcript of Records upon request.

Course Instructor(s)

This course will be conducted by the following instructor(s). However, we have the right to change the course instructor(s) prior to the course date and inform participants accordingly:

Mr. Ahmed Sabry is a **Senior Communications & Control Engineer** with extensive experience in the **Petroleum**, **Petrochemical**, **Power**, **Pipelines** and **Communication** industries. His specialization covers the areas of **Fiber Optic** Professional, **Fiber Optics** Access Network Planning, **Fiber Optic** Technologies & Installation, Practical **Fiber Optics** Technology, Certified Fiber Optics Professional (**CFOP**), Practical **Fiber Optic Cables** (Joining & Termination), Practical **Fiber Optics** for Engineers & Technicians, **Process Control & Instrumentation**, **Process Control** Loop Operations, **Process Control** Troubleshooting & Problem Solving, **Process Analyzer** & Analytical Instrumentation, Distributed Control Systems (**DCS**), Programmable Logic Controller (**PLC**), Interruptible Power Systems (**UPS**), **Gas turbine**, **Steam Turbine**, **Rotational Speed & Guide**, **Supervisory Control** and Data Acquisition (**SCADA**), **High Voltage Electrical Safety**, **Circuit Breaker**, **Control System** Interface, **HV Switchgear** Maintenance, **Power Generation** Operation & Control, Fundamentals of **Power System Equipment**, Variable Frequency Drives **(VFD), Electrical Fault Analysis**, **Electrical Schematic Drawing**, **Cable Splicing and Terminating of Low-Voltage Cables**, Electrical Transient Analysis Programme **(ETAP)**, **AC/DC Motors**, Combined Cycle **Power Generation**, **Power System Protective Relaying,** Modern **Power Systems Protective Relaying**, **Antisurge Controllers**, **Cyber Security of Industrial Control System**, **Data Accuracy & System Function**, **Network** Comprehensive, Systems Analysis, **SCADA Security**, ESD System Function, Analysis & Control, **Custody Measurement & Loss Control**, **HV/MV Substation** Design & Maintenance, **PLC & SCADA Automation**, **SIS**, **SIL**, **ESD**, **Alarm Management** Systems and **Data Communication**. He is currently the **Operations & Maintenance Manager** of National Advanced Control Center (**NATA**) which is a **natural gas** transmission company and at the same time, he is the **Technical Manager** of the **SCADA Innovations**.

Mr. Ahmed has handled wide-ranging responsibilities in **communication**, **control** and **instrumentation** engineering throughout his career life. He started as **ODM Engineer**, **Fiber Optic Engineer**, **Network Technician** and **Fiber Optic Technician** for a multinational communication company in their **wireless access** solution department. This gave him the chance to join another multinational communication company working in **Optical Fiber Cables** and **SDH** transmission providing backbone **communication networks** for **SCADA projects** in **oil** and **natural gas** industries. Later on in his career, he worked for a natural gas transmission company as a **Senior SCADA Engineer** and took the responsibility for installation, commissioning, operation and maintenance of **SCADA systems** and its **communication links**.

Mr. Ahmed has a **Bachelor's** degree in **Electronics** and **Communications Engineering**. He is a **Certified Instructor/Trainer**, a certified **PMP Project Manager**, a **Certified Fiber Optic Technician**. Further, he has certifications in **SDH**, **Advanced PLC** and **Advanced SCADA** engineering from **ABB Italy** and he has **published numerous books** such as "**Control Centers**", **Remote Terminal Units & Communication**" and "**SCADA**" just to name a few. He has further delivered and presented innumerable trainings, courses, workshops, seminars and conferences worldwide.

Training Methodology

All our Courses are including **Hands-on Practical Sessions** using equipment, State-of-the-Art Simulators, Drawings, Case Studies, Videos and Exercises. The courses include the following training methodologies as a percentage of the total tuition hours:-

30% Lectures
20% Practical Workshops & Work Presentations
30% Hands-on Practical Exercises & Case Studies
20% Simulators (Hardware & Software) & Videos

In an unlikely event, the course instructor may modify the above training methodology before or during the course for technical reasons.

Course Fee

US$ 5,500 per Delegate + **VAT**. This rate includes H-STK® (Haward Smart Training Kit), buffet lunch, coffee/tea on arrival, morning & afternoon of each day.

Accommodation

Accommodation is not included in the course fees. However, any accommodation required can be arranged at the time of booking.

Course Program

The following program is planned for this course. However, the course instructor(s) may modify this program before or during the course for technical reasons with no prior notice to participants. Nevertheless, the course objectives will always be met:

Day 1

0730 – 0800	*Registration & Coffee*
0800 – 0815	*Welcome and Introduction*
0815 – 0830	***PRE-TEST***
0830 – 0930	***Introduction to Fiber Optics Systems*** *Introduction • Outline of Course • Historical Background to Fiber Optic • Comparison of Fiber Optics and Copper Systems*
0930 – 0945	*Break*
0945 – 1100	***Definitions, Basic Principles*** *Data Communications • Communications Channels • Transmission Modes*
1100 – 1230	***Definitions, Basic Principles (cont'd)*** *The Electromagnetic Spectrum • Revisiting Copper*
1230 – 1245	*Break*
1245 – 1420	***Theory of Fiber Optics Transmission*** *Fundamental Principals of Operation • Light Transmission Nature of Glass • Numerical Aperture • Modal Propagation in Fibers • Multimode/Single Mode/StepIndex/Graded Index*
1420 - 1430	***Recap***
1430	*Lunch & End of Day One*

Day 2

0730 – 0930	***Theory of Fiber Optics Transmission (cont'd)*** *Bandwidth of Fibers • Modal and Chromatic Dispersion • Absorption/Scatter/Bending/Radiation/Mismatches • Other Types of Fibers*
0930 – 0945	*Break*
0945 – 1100	***Construction of Fiber Optic Cables*** *Cable Objectives • Tensile Ratings • Structural Elements • Housings – Loose Tube/Slotted Core/Tight Buffered*
1100 - 1230	***Construction of Fiber Optic Cables (cont'd)*** *Sheaths and Moisture Barriers • Classes of Cables – Aerial/Underground/Sub Aqueous/Indoor*
1230 – 1245	*Break*
1300 – 1420	***Connecting Fibers*** *Optical Connection Issues • Fiber End Preparation • Splicing Fibers – Fusion/Mechanical • Connectors • Optical Couplers*
1420 - 1430	***Recap***
1430	*Lunch & End of Day Two*

Day 3: Tuesday, 18th of November 2025

0730 – 0830	***Practical Session #1 - Optical Connectors*** *Each Delegate to Fit One ST & One SC Connector to a Cable and Inspect the Connectors*
0830 – 0930	***Practical Session #2- Fusion Splicing*** *Each Student to Make a Fusion Splice in their Cable*
0930 – 0945	*Break*
0945 – 1230	***Optical Drivers and Detectors*** *Light Emitting Diodes • Lasers • Transmitters Modules • Safety Considerations• PIN Photodiodes • Receiver Modules • Optical Amplifiers*
1230 – 1245	*Break*
1245 – 1345	***Fiber Optic Termination Patch Panels*** *Compact Fiber Optic Patch Panel • Wall Mounted Optical Fiber Patch Panels • Rack Mounted Optical Fiber Termination Panel • Splice Trays • Terminal Blocks & Patch Panels • Enclosures, Racks & Equipment Housings • Faceplate Slide-Out Mechanism*
1345 – 1420	***Types of Adapters & its Merits/Demerits*** *Optical Fiber Connectors – Duplex 568SC Adapter • Optical Fiber Connectors – simplex ST - ST Adapter • Other Fiber Optic Adapters*
1420 - 1430	***Recap***
1430	*Lunch & End of Day Three*

Day 4

0730 - 0930	***Installing Fiber Optic Cables*** *Initial Preparation – Site Survey/Design • General Installation Rules and Procedures • Bending Radius/Cable Tension/Cable Reels • Cable Trays/Conduits/Lubricants •Indoor Cable Installation/Leaving Extra Cable • Outdoor Cable Installation/Environmental Conditions • Splicing Trays / Organizers /Termination Cabinets/Patch Panels / Distribution Panels / Breakout Boxes*
0930 – 0945	*Break*
0945 – 1100	***Fiber Optics System Design*** *Initial Design Considerations • Future Capacity/Reliability/Operation Wavelength • Repeaters and Amplifiers • Design Loss Calculations/Link Loss Budgets • Design Bandwidth Calculations*

1100 - 1230	***Media Converters*** *Convert UTP Ethernet to Fiber Optics • Specifications for the Media Converters*
1230 – 1245	*Break*
1245 – 1420	***Testing of Fiber Optic Systems*** *Concepts of Optical Measurement • Continuity Testing • Insertion Loss Testing • Optical Time Domain Reflectometry (OTDR) • Bit Error Rate (BER) Testing • Eye Diagrams • Laboratory Fiber Tests*
1420 - 1430	***Recap***
1430	*Lunch & End of Day Four*

Day 5

0730 – 0930	***Practical Session #3- Insertion Loss Testing*** *Students to Measure the Insertion Loss of their Cable*
0930 – 0945	*Break*
0945 – 1230	***Technologies That Use Optical Fibers*** *Low Speed Modems • 10 Base F/FDDI/FIORL • ATM*
1230 – 1245	*Break*
1245 – 1300	***Technologies That Use Optical Fibers (cont'd)*** *LAN's/MAN's/WAN's • Analog Modulators for Video and Microwave Links • HDTV*
1300 – 1315	***Course Conclusion***
1315 – 1415	***COMPETENCY EXAM***
1415 – 1430	*Presentation of Course Certificates*
1430	*Lunch & End of Course*

Practical Sessions

Practical sessions will be organized during the course for delegates to practice the theory learnt. Delegates will be provided with an opportunity to carryout fiber optic splicing, testing and troubleshooting exercises using the following state-of-the-art fiber optics technology and equipment, suitable for classroom training.

FSM-50S PROFILE ALIGNMENT FUSION SPLICER

Features & Capabilities:

- Fully automatic core alignment with 9 second splice time for SM fibre
- Reduced splice protector shrink time – now only 35 seconds
- Extremely compact & lightweight – just 2.8kg
- Automatic fibre-type identification
- Multi-position monitor for front or top mounting
- Real-time arc calibration
- Fibre clamps integrated into wind protector to reduce operation time

OptiFiber® OTDR

Features & Capabilities:

- Integrates power/loss, fiber length measurement, OTDR analysis and fiber connector end-face imaging
- allows network owners of any experience level to certify fiber to industry specifications and standards, troubleshoot links, and thoroughly document results
- makes dual wavelength OTDR measurements - 850/1300 nm or 1310/1550 nm
- identifies and characterizes the fiber link and its events
- compares the results to user-defined limits for immediate pass/fail link and event certification

Course Coordinator

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