COURSE OVERVIEW IE0172

Building Management System (BMS) - Principles & Practices

Course Title
Building Management System (BMS) - Principles & Practices

Course Date/Venue
Session 1: April 21-25, 2025/Fujairah Meeting Room, Grand Millennium Al Wahda Hotel, Abu Dhabi, UAE
Session 2: November 09-13, 2025/Boardroom 1, Elite Byblos Hotel Al Barsha, Sheikh Zayed Road, Dubai, UAE

Course Reference
IE0172

Course Duration/Credits
Five days/3.0 CEUs/30 PDHs

Course Description

This practical and highly-interactive course includes real-life case studies and exercises where participants will be engaged in a series of interactive small groups and class workshops.

This course is designed to provide participants with a detailed and up-to-date overview of Building Management System (BMS) - Principles & Practices. It covers the components and architecture of BMS and its role in energy efficiency and sustainability; the sensors, controllers and processors, actuators and user interface for monitoring and control; the BMS communication protocols and functions and automated processes; the basics of heating, ventilation, and air conditioning (HVAC), smart lighting technologies and fire detection and alarm integration; managing building access, CCTV monitoring and integration, intrusion detection and alarm systems; monitoring power consumption in real-time; and the load management and peak shaving techniques.

Further, the course will also discuss the water consumption and leak detection, control pumps and irrigation systems, rainwater harvesting integration and optimizing water usage for sustainability; the BMS installation, system architecture design and setting up sensors, controllers, and actuators; the communication network setup and testing; the HVAC, lighting, and security systems and ensuring compatibility across communication protocols; creating automation sequences for building operations, configuring alarms and notifications and developing schedules for lighting and HVAC systems; and testing and troubleshooting automation scripts.

During this interactive course, participants will learn the monitoring and analysis of data and preventive maintenance; the system troubleshooting and system optimization; the potential security threats and network security measures; conducting regulatory compliance and audits; the role of IoT in enhancing including artificial intelligence in BMS; incorporating solar panels and wind turbines; managing battery storage and energy distribution and net metering and grid integration; setting benchmarks for energy and operational efficiency; and comparing performance across buildings and identifying areas for improvement.

Course Objectives

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

- Apply and gain in-depth knowledge on the principles and practices of building management system (BMS)
- Discuss the components and architecture of BMS and its role in energy efficiency and sustainability
- Identify sensors, controllers and processors, actuators and user interface for monitoring and control
- Recognize BMS communication protocols, functions and automated processes
- Discuss BMS standards and regulations covering ISO standards, energy performance standards and health and safety regulations in building automation
- Explain the basics of heating, ventilation, and air conditioning (HVAC), smart lighting technologies and fire detection and alarm integration
- Manage building access, CCTV monitoring and integration, intrusion detection and alarm systems
- Monitor power consumption in real-time and apply load management and peak shaving techniques
- Monitor water consumption and leak detection, control pumps and irrigation systems, apply rainwater harvesting integration and optimize water usage for sustainability
- Plan a BMS installation, illustrate system architecture design, set up sensors, controllers, and actuators and apply communication network setup and testing
- Integrate HVAC, lighting, and security systems and ensure compatibility across communication protocols
- Create automation sequences for building operations, configure alarms and notifications, develop schedules for lighting and HVAC systems and test and troubleshoot automation scripts
- Monitor and analyze data and apply preventive maintenance, system troubleshooting, and system optimization
- Identify potential security threats and implement network security measures
- Conduct regulatory compliance and audits and discuss the role of IoT in enhancing including artificial intelligence in BMS

- Incorporate solar panels and wind turbines, manage battery storage and energy distribution and apply net metering and grid integration
- Set benchmarks for energy and operational efficiency, compare performance across buildings and identify areas for improvement

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 The Principles & Practices of Building Management System (BMS) for facility managers, building engineers, BMS technicians/operators, design engineers, energy managers, consultants, project managers, safety and security personnel, students and recent graduates, building owners and developers and those who involved in the design, operation, or maintenance of building systems.

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$ 8,000 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 Certificate(s)

Internationally recognized certificates will be issued to all participants of the course who completed a minimum of 80% of the total tuition hours.

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 BAC.

- 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. Sydney Thoresson, PE, BSc, is a **Senior Electrical & Instrumentation Engineer** with over **40 years** of extensive experience within the **Building Management System** (BMS), **Petrochemical**, **Utilities**, **Oil**, **Gas** and **Power** industries. His specialization highly evolves in **Building Management System (BMS), Controllers and processors in BMS, Lighting management and automation, HVAC system monitoring, Testing and troubleshooting automation scripts, Building Information & Modelling (BIM), Process Control Instrumentation**, **Process Instrumentation & Control**, **Process Control**, **Instrumentation**, **Troubleshooting** & Problem Solving, Process **Instrumentation** and Control Techniques, **Instrumentation** for Process Optimization and Control, Process Automation and **Instrumentation** Systems Integration, Troubleshooting in Process Control Systems**,** Process Control & Safeguarding, **Troubleshooting Instrumentation** and Control Systems, GC Processes **Troubleshooting** and Control Systems, Practical **Troubleshooting** and Repair of Electronic Circuits, Process Control, **Troubleshooting** & **Problem Solving.** Process Control (**PCI**) & Safeguarding, **Control Loop & Valve Tuning**, **Controller Maintenance** Procedures, High Integrity Protection Systems (**HIPS**), **Instrument Calibration & Maintenance**, **Instrumented Safety Systems**, **Compressor Control & Protection**, **Control Systems**, Programmable Logic Controllers (**PLC**), **SCADA System**, **PLC & SCADA** - Automation & Process Control, **PLC & SCADA** Systems Application, Technical **DCS/SCADA**, **PLC-SIMATIC S7 300/400**: Configuration, Programming and Troubleshooting, **PLC, Telemetry and SCADA** Technologies, Cyber Security of Industrial Control System (**PLC, DCS, SCADA & IED**), Basics of **Instrumentation Control System, DCS**, **Distributed Control System** - Operations & Techniques, Distributed Control System (**DCS**) Principles, Applications, Selection & Troubleshooting, Distributed Control Systems (**DCS**) especially in **Honeywell DCS**, **H&B DCS**, **Modicon, Siemens**, **Telemecanique**, **Wonderware** and **Adrioit,** Safety Instrumented Systems (**SIS**), Safety Integrity Level (**SIL**), Emergency Shutdown (**ESD**), **Emergency Shutdown** System, Variable Frequency Drive (**VFD**), **Process Control & Safeguarding**, **Field Instrumentation**, **Instrumented Protective Devices** Maintenance & Testing, Instrumented Protective Function (**IPF**), **Refining & Rotating Equipment**, **Equipment Operations**, **Short Circuit Calculation**, **Voltage Drop Calculation**, **Lighting Calculation**, **Hazardous Area Classification**, **Intrinsic Safety**, **Liquid & Gas Flowmetering**, **Custody Measurement**, **Ultrasonic Flowmetering**, **Loss Control**, **Gas Measurement**, **Flowmetering & Custody Measurement**, **Multiphase Flowmetering**, **Measurement and Control**, **Mass Measuring System Batching** (**Philips**), Arc Furnace Automation-Ferro Alloys, Walking Beam Furnace, Blast Furnace, Billet Casting Station, Cement Kiln Automation, Factory Automation and Quality Assurance Accreditation (**ISO 9000** and **Standard BS 5750**). Further, he is also well-versed in **Electrical Safety**, **Electrical Hazards Assessment**, **Electrical Equipment**, **Personal Protective Equipment**, Log-Out & Tag-Out (**LOTO**), **ALARP & LOPA** Methods, Confined Workspaces, Power **Quality**, Power **Network**, Power **Distribution**, **Distribution Systems**, **Power Systems Control**, **Power Systems Security**, Power **Electronics**, Electrical **Substations**, **UPS** & **Battery System**, **Earthing & Grounding**, Power **Generation**, **Protective Systems**, **Electrical Generators**, **Power** & **Distribution Transformers**, **Electrical Motors**, **Switchgears**, **Transformers**, **AC** & **DC Drives**, **Variable Speed Drives** & **Generators** and **Generator Protection**. He is currently the **Projects Manager** wherein he manages projects in the field of electrical and automation engineering and in-charge of various process hazard analysis, fault task analysis, FMEA and HAZOP study.

During Mr. Thoresson's career life, he has gained his thorough and practical experience through various challenging positions and dedication as the **Contracts & Projects Manager**, **Managing Director**, **Technical Director**, **Divisional Manager**, **Plant Automation Engineer**, **Senior Consulting Engineer**, **Senior Systems Engineer**, **Electrical & Instrumentation Engineer**, **Consulting Engineer**, **Service Engineer** and **Section Leader** from several international companies such as **Philips**, **FEDMIS**, **AEG**, **DAVY International**, **BOSCH**, **Billiton** and **Endress/Hauser**.

Mr. Thoresson is a **Registered Professional Engineering Technologist** and has a **Bachelor's** degree in **Electrical & Electronics Engineering** and a **National Diploma** in **Radio Engineering**. Further, he is a **Certified Instructor/Trainer**, a **Certified Internal Verifier/Assessor/Trainer** by the **Institute of Leadership & Management** (**ILM**) and an active member of the International Society of Automation (**ISA**) and the Society for Automation, Instrumentation, Measurement and Control (**SAIMC**). He has further delivered numerous trainings, courses, seminars, conferences and workshops worldwide.

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 & Introduction
0815 – 0830	**PRE-TEST**
0830 – 0900	***Overview of Building Management Systems*** Definition & Purpose of BMS • Components & Architecture of BMS • Advantages of Implementing BMS in Modern Buildings • Role of BMS in Energy Efficiency & Sustainability
0900 - 0930	***BMS Core Components*** Sensors & their Role in Data Collection • Controllers & Processors in BMS • Actuators & their Functions • User Interface (HMI/SCADA) for Monitoring & Control
0930 – 0945	Break
0945 – 1130	***BMS Communication Protocols*** BACnet: Overview & Applications • Modbus: Basics & Integration with BMS • KNX: Benefits & Limitations • LonWorks: Features & Use Cases
1130 – 1230	***Functions of BMS*** HVAC System Monitoring & Control • Lighting Management & Automation • Fire & Safety System Integration • Energy Monitoring & Reporting
1230 – 1245	Break
1245 – 1345	***Basics of Automation in BMS*** Understanding Automated Processes • Role of Artificial Intelligence in BMS • Real-Time Monitoring & Decision-Making • Enhancing Occupant Comfort & Operational Efficiency
1345 – 1420	***BMS Standards & Regulations*** ISO Standards Related to BMS • Energy Performance Standards • Health & Safety Regulations in Building Automation • Compliance with Green Building Certifications (LEED, BREEAM)
1420 - 1430	***Recap*** Using this Course Overview, the Instructor(s) will Brief Participants about the Topics that were Discussed Today and Advise Them of the Topics to be Discussed Tomorrow
1430	Lunch & End of Day One

Day 2

0730 – 0900	***HVAC Systems in BMS*** Basics of Heating, Ventilation, & Air Conditioning • Integration of HVAC with BMS • Temperature & Humidity Control Strategies • Maintenance of HVAC Systems through BMS
0900 – 0930	***Lighting Control Systems*** Smart Lighting Technologies • Automated Dimming & Daylight Harvesting • Motion Sensors & Occupancy Detection • Scheduling & Energy Optimization
0930 – 0945	Break
0945– 1130	***Fire Alarm & Safety Systems*** Fire Detection & Alarm Integration • Monitoring Fire Suppression Systems • Emergency Lighting & Evacuation Control • Real-Time Alerts & Response Coordination

1130 – 1230	***Access Control & Security*** *Role of BMS in Managing Building Access • CCTV Monitoring & Integration • Intrusion Detection & Alarm Systems • Visitor Management & Reporting*
1230 – 1245	*Break*
1245 – 1345	***Energy Management Systems*** *Monitoring Power Consumption in Real-Time • Load Management & Peak Shaving Techniques • Integration of Renewable Energy Sources • Reporting & Analytics for Energy Performance*
1345 – 1420	***Water Management Systems*** *Monitoring Water Consumption & Leak Detection • Control of Pumps & Irrigation Systems • Rainwater Harvesting Integration • Optimizing Water Usage for Sustainability*
1420 - 1430	***Recap*** *Using this Course Overview, the Instructor(s) will Brief Participants about the Topics that were Discussed Today and Advise Them of the Topics to be Discussed Tomorrow*
1430	*Lunch & End of Day Two*

Day 3

0730 – 0830	***Planning a BMS Installation*** *Assessing Building Requirements • Identifying System Goals & Key Performance Indicators • Stakeholder Involvement in the Planning Phase • Budgeting & Cost Considerations*
0830 - 0930	***System Architecture Design*** *Centralized versus Distributed BMS Architecture • Choosing Hardware & Software Components • Scalability & Flexibility of System Design • Integration with Existing Building Systems*
0930 – 0945	*Break*
0945 – 1130	***Installation & Commissioning*** *Setting up Sensors, Controllers, & Actuators • Communication Network Setup & Testing • Software Installation & Programming • Commissioning & Validation of the BMS*
1130 – 1230	***Integration of Subsystems*** *Integrating HVAC, Lighting, & Security Systems • Ensuring Compatibility Across Communication Protocols • Configuring Data Sharing Between Subsystems • Overcoming Challenges in Integration*
1230 – 1245	*Break*
1245 – 1345	***System Programming & Automation*** *Creating Automation Sequences for Building Operations • Configuring Alarms & Notifications • Developing Schedules for Lighting & HVAC Systems • Testing & Troubleshooting Automation Scripts*
1345 – 1420	***Training & Handover*** *Training Building Staff on BMS Usage • Documentation of System Operations • Handover of System Control & Responsibilities • Post-Installation Support & Maintenance*
1420 - 1430	***Recap*** *Using this Course Overview, the Instructor(s) will Brief Participants about the Topics that were Discussed Today and Advise Them of the Topics to be Discussed Tomorrow*
1430	*Lunch & End of Day Three*

Day 4

0730 – 0830	***Monitoring & Analyzing Data*** *Real-Time Data Visualization on Dashboards • Trend Analysis & Performance Tracking • Identifying Anomalies & Inefficiencies • Generating Periodic Reports*
0830 – 0930	***Preventive Maintenance*** *Scheduling Regular Inspections for Sensors & Controllers • Ensuring Proper Calibration of Devices • Identifying Wear & Tear in Components • Avoiding Downtime through Predictive Maintenance*
0930 – 0945	*Break*
0945 – 1130	***System Troubleshooting*** *Common Issues in BMS Operations • Diagnosing Communication Errors • Resolving Actuator & Sensor Failures • Reprogramming Automation Sequences*
1130 – 1230	***System Optimization*** *Fine-Tuning Automation for Energy Savings • Updating Schedules Based on Building Occupancy • Using Analytics for Continuous Improvement • Upgrading Hardware & Software Components*
1230 – 1245	*Break*
1245 – 1345	***Cybersecurity in BMS*** *Identifying Potential Security Threats • Implementing Network Security Measures • Regularly Updating Firmware & Software • Training Staff on Cybersecurity Best Practices*
1345 – 1420	***Regulatory Compliance & Audits*** *Conducting Internal BMS Audits • Ensuring Compliance with Energy & Safety Regulations • Preparing for Third-Party Inspections • Documenting Improvements & Updates*
1420 - 1430	***Recap*** *Using this Course Overview, the Instructor(s) will Brief Participants about the Topics that were Discussed Today and Advise Them of the Topics to be Discussed Tomorrow*
1430	*Lunch & End of Day Four*

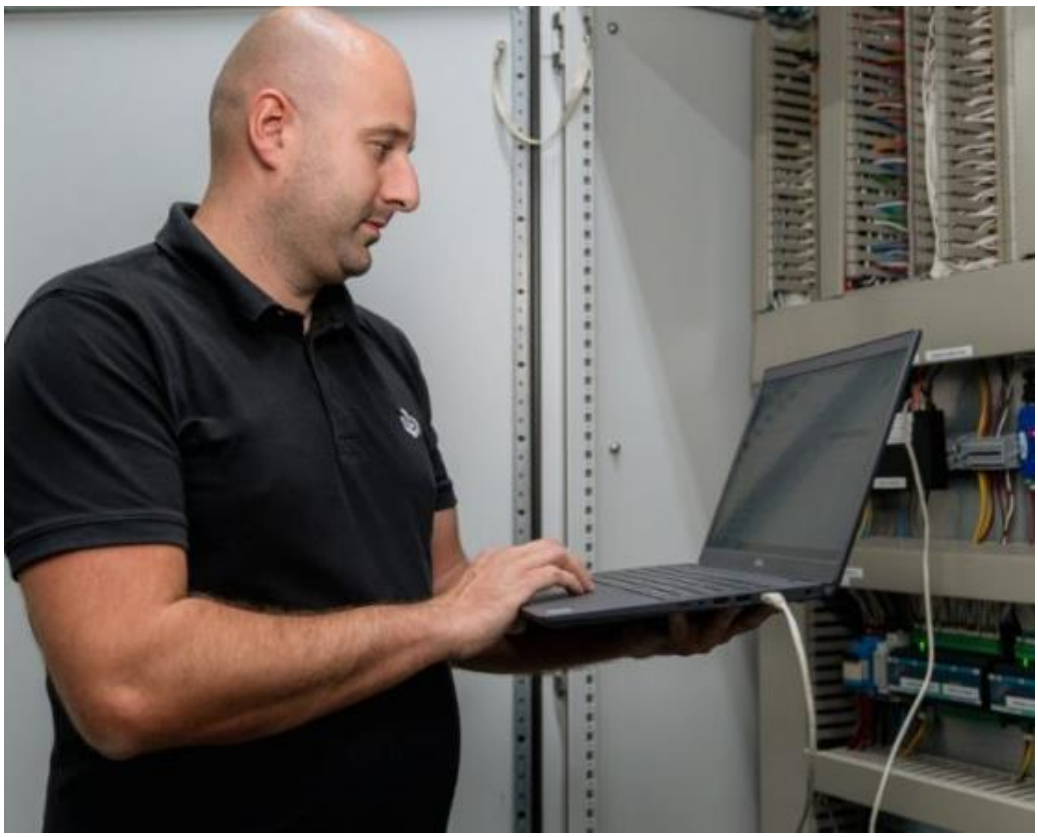
Day 5

0730 – 0830	***Smart Buildings & IoT*** *Role of IoT in Enhancing BMS Capabilities • Integration with Smart Appliances & Devices • Predictive Analytics through IoT Sensors • Cloud-Based BMS Platforms*
0830 – 0930	***Artificial Intelligence in BMS*** *AI-Driven Predictive Maintenance • Smart Scheduling using Machine Learning • Energy Optimization through AI Algorithms • Enhancing Occupant Comfort with AI Insights*
0930 – 0945	*Break*
0945 – 1230	***Integration with Renewable Energy*** *Incorporating Solar Panels & Wind Turbines • Managing Battery Storage & Energy Distribution • Net Metering & Grid Integration • Benefits of Renewable Energy in BMS*
1230 – 1245	*Break*
1245 – 1315	***Building Performance Benchmarking*** *Setting Benchmarks for Energy & Operational Efficiency • Comparing Performance across Buildings • Identifying Areas for Improvement • Reporting Results to Stakeholders*

1315 - 1345	***Case Studies and Real-World Applications*** *Successful BMS Implementations in Commercial Buildings • Challenges Faced & Solutions Implemented • Lessons Learned from Real-World Projects • Discussion on Emerging Best Practices*
1345 – 1400	***Course Conclusion*** *Using this Course Overview, the Instructor(s) will Brief Participants about the Course Topics that were Covered During the Course*
1400 – 1415	***POST-TEST***
1415 – 1430	*Presentation of Course Certificates*
1430	*Lunch & End of Course*

Practical Sessions

This practical and highly-interactive course includes real-life case studies and exercises:-



Course Coordinator

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