COURSE OVERVIEW ME0293
Commissioning of HVAC System & Heat Load Calculation

Course Title
Commissioning of HVAC System & Heat Load Calculation

Course Reference
ME0293

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

Course Date/Venue

Session(s)	Date	Venue
2	May 11-15, 2025	Boardroom 1, Elite Byblos Hotel Al Barsha, Sheikh Zayed Road, Dubai, UAE
3	August 04-08, 2025	Ajman Meeting Room, Grand Millennium Al Wahda Hotel, Abu Dhabi, UAE
4	November 16-20, 2025	Al Khobar Meeting Room, Hilton Garden Inn, Al Khobar, KSA

Course Description

This practical and highly-interactive course includes various practical sessions and exercises. Theory learnt in the class will be applied using the following practical methods:

(**1**) **Industrial Facility Visit:** Course participants will be taken to an industrial facility where they will practice testing, maintenance and troubleshooting. In case that this course is organized inside client premises (In-House), then client shall provide access to its HVAC and refrigeration workshop for practical sessions.

(**2**) **HVAC Simulator:** Participants will use in the class the state-of-the-art HVAC Simulator to practice some of the skills learnt.

This course is designed to provide participants with a detailed and up-to-date overview of commissioning of HVAC system or heat load calculation. It covers the HVAC basics, HVAC codes and standards and HVAC&R abbreviations; the air conditioning, ventilation and refrigeration; the basic principles of HVAC&R covering air properties, dry bulb temperature, wet bulb temperature, dew point, humidity ratio and relative humidity; the psychrometric chart; the sensible and latent heat, design conditions, air purification methods and air motion; and comfortable velocity ranges, heat gain from occupants, moisture removal and design conditions.

During this interactive course, participants will learn the HVAC systems comprising of air systems and water systems as well as the HVAC design criteria; the calculation of the load components, sensible load, latent load, load categories, skin load, internal loads, people load, light load, equipment load, room load, effective load and other loads; the types of air conditioning units/systems; the load calculations using HAP software as well as cooling/heating load calculations and HVAC systems commissioning; and the HVAC inspection, performance calculations and troubleshooting analysis according to ANSI/ASHRAE/ACCA 180-2012 standard.

Course Objectives

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

- Apply systematic techniques on commissioning of HVAC system or heat load calculation
- Discuss the HVAC basics, HVAC codes and standards and HVAC&R abbreviations
- Define air conditioning, ventilation and refrigeration
- Describe the basic principles of HVAC&R covering air properties, dry bulb temperature, wet bulb temperature, dew point, humidity ratio and relative humidity
- Explain psychrometric chart covering its definition, properties and application including heat transfer and method of heat transfer
- Discuss sensible and latent heat, design conditions, air purification methods and air motion
- Determine comfortable velocity ranges, heat gain from occupants, moisture removal and design conditions
- Recognize HVAC systems comprising of air systems and water systems as well as the HVAC design criteria
- Calculate load components, sensible load, latent load, load categories, skin load, internal loads, people load, light load, equipment load, room load, effective load and other loads
- Identify the types of air conditioning units/systems
- Employ load calculations using HAP software as well as cooling/heating load calculations and HVAC systems commissioning
- Carryout HVAC inspection, performance calculations and troubleshooting analysis according to ANSI/ASHRAE/ACCA 180-2012 standard

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 a complete and up-to-date overview of HVAC & refrigeration systems for HVAC, utilities, maintenance, plant, operation and inspection engineers and other technical staff who are involved in the design, installation, maintenance and troubleshooting of such equipment and system. Further, it is suitable for mechanical, design, electrical and consulting engineers.

Course Certificate(s)

Internationally recognized certificates will be issued to all participants of the course.

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. Steve Nomico, PE, BSc, is a **Senior Mechanical Engineer** with over **40 years** of industrial experience within the **Oil & Gas**, **Petrochemical**, **Power** and **Utilities** industries. His specialization widely covers **HVAC**, **HVAC Design Criteria**, **Design Conditions**, **Heat Transfer**, **Air Purification Methods and Air Motion**, **Refrigeration**, **Duct Insulation**, **Material Selection and Sizing**, **Piping & Pipeline Design**, **Inspection & Testing**, **Maintenance**, **Repair & Integrity Assessment**; Fitness-for-Service (**FFS**); **Flange & Mechanical Joints**; **Pressure & Leak Testing** and **Repair Techniques**. Further, he is also well-versed in **Water Distribution Network System**, **Network Drawings**, **Pumps**, **Valves** and **Marine Terminals**. Currently, he is the **Testing & Commissioning Manager** of **Keppel Seghers Engineering Services** where-in he is responsible for the design, specification, construction and maintenance of **piping systems**, **pipelines**, **process plants**, **water network**, **pump stations**, **storage facilities**, **marine terminals**, **tank farms** and **mechanical equipment**.

During his career life, Mr. Nomico has worked internationally in conjunction with **ABB** and **Kentz**, providing **mechanical equipment design** of large **sewearage/water treatment**, **pumping** & **reticulation plant** and all related services. He has further filled the role of **Group Engineering Manager** for **FFS Refiners**, a waste **oil refining company** with plant including **Hydrogenation**, **Distillation**, **Centrifugation** and **Filtration** and extensive **storage facilities**. He worked globally for numerous international companies in **Europe**, **the Middle East**, **Asia** and **African regions** for various significant positions such as a **Chief Executive Officer**, **Consultant**, **Senior Resident Engineer**, **Senior Project Engineer**, **Senior Mechanical Engineer**, **Project Manager**, **Mechanical Department Head**, **Project Engineer**, **Product Engineer** and **Engineering Officer**.

Mr. Nomico is a **Registered Professional Engineer** and he has a **Bachelor** degree in **Mechanical Engineering** with **Honours** from the **University of Natal**. Further, he is an active member of the Engineering Council of South Africa (**ECSA**).

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.

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 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	***Introduction*** *Introduction to HVAC Basics • HVAC&R Abbreviations • HVAC Codes & Standards*
0900 – 0930	***HVAC&R Definitions*** *Air Conditioning • Ventilation • Refrigeration • HVAC&R Overview*
0930 – 0945	*Break*
0945 – 1100	***Basic Principals of HVAC&R*** *Air Properties • Dry Bulb Temperature • Wet Bulb Temperature • Dew Point • Humidity Ratio • Relative humidity*
1100 – 1215	***Psychrometric Chart*** *Definition • Properties of Psychrometry • Psychrometric Chart • Psychrometric Chart Application - Heat Transfer • Method of Heat Transfer*
1215 – 1230	*Break*
1230 – 1420	***Sensible & Latent Heat*** *Sensible Heat Definition • Latent Heat Definition • First Law of Thermodynamic*
1420 – 1430	***Recap***
1430	*Lunch & End of Day One*

Day 2

0730 – 0900	***Design Conditions*** *Outdoor Climate • Indoor Comfort • Solar Orientation • Indoor Air Quality*
0900 – 0930	***Air Purification Methods & Air Motion***
0930 – 0945	*Break*
0945 – 1100	***Comfortable Velocity Ranges, Heat Gain from Occupants, Moisture Removal & Design Conditions***

1100 – 1215	***HVAC Systems*** *Air Systems, Air/Water Systems*
1215 – 1230	*Break*
1230 – 1420	***HVAC Design criteria*** *Outdoor Design Conditions – Indoor Design Conditions*
1420 – 1430	***Recap***
1430	*Lunch & End of Day Two*

Day 3

0730 – 0900	***Load Calculations*** *Load Components • Sensible Load • Latent Load • Load Categories • Skin Load • Internal loads • People Load • Light Load • Equipment Load*
0900 – 0930	***Room Load, Effective Load & Other Loads (Return Air Side Load – Supply)***
0930 – 0945	*Break*
0945 – 1100	***Types of Air Conditioning (Units – Systems)*** *According Types • According System*
1100 – 1215	***Load Calculations:*** *Load Calculations System • Manual Calculations • Room Load Calculations • Transmission Load Sun Load Calculation • Persons Load • Light Load • Equipment Load*
1215 – 1230	*Break*
1230 – 1420	***Load Calculations using HAP Software*** *Hourly Analysis Program (HAP) • Design Cooling & Heating Tool) • Hap Tools • Weather Data Input • Scheduled Data • Case Study Gymnasium Cooling Load Calculations Using HAP Program*
1420 – 1430	***Recap***
1430	*Lunch & End of Day Three*

Day 4

0730 – 0930	***Cooling/Heating Load Calculations*** *Gymnasium Design Calculations using HAP Software(Weather Data – Space Data – System Data) Entry – Design Report*
0930 – 0945	*Break*
0945 – 1100	***HVAC Systems Commissioning*** *Commissioning (Definitions – Goals – Objectives)*
1100 – 1215	***HVAC Systems Commissioning (cont'd)*** *Commissioning Standards ANSI/ ASHRAE 111-2012*
1215 – 1230	*Break*
1230 – 1420	***HVAC Systems Commissioning (cont'd)*** *Systems • Procedures • Tools • Log Sheets*
1420 – 1430	***Recap***
1430	*Lunch & End of Day Four*

Day 5

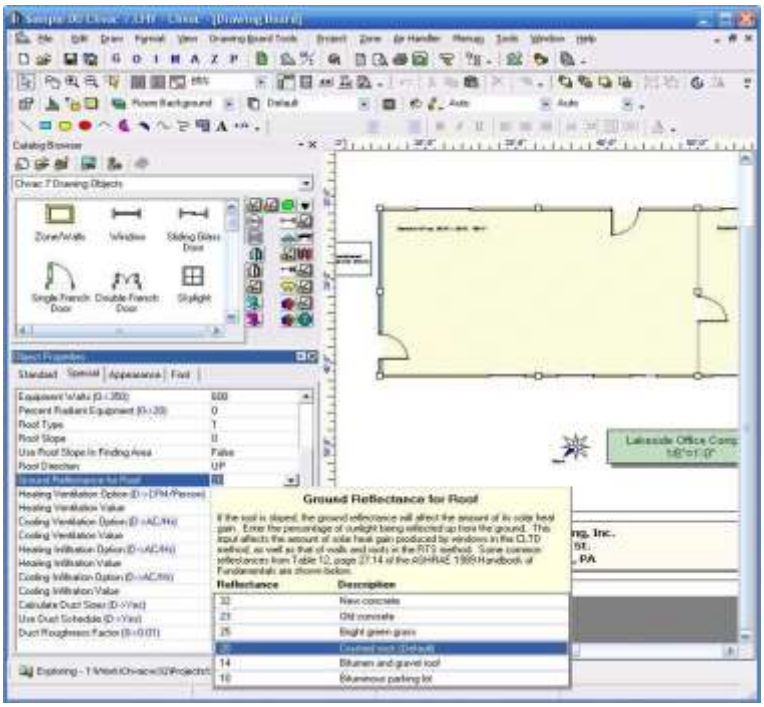
0730 – 0930	***HVAC Commissioning For*** *Refrigeration Circuits • Water Circuits • Air Circuits • Electrical Circuits • Control Circuits*
0930 – 0945	*Break*
0945 – 1100	***HVAC Inspection & Performance calculations For*** *Refrigeration Circuits • Water Circuits • Air Circuits • Electrical Circuits • Control Circuits*
1100 – 1215	***HVAC Inspection & Maintenance Standards*** *ANSI/ASHRAE/ACCA 180-2012 standard*
1215 – 1230	*Break*
1230 – 1345	***HVAC Troubleshooting Analysis*** *Faults • Possible Causes • Actions*
1345 – 1400	***Course Conclusion***
1400 – 1415	***POST-TEST***
1415 – 1430	*Presentation of Course Certificates*
1430	*Lunch & End of Course*

Practical Sessions/Site Visit

Simulator (Hands-on 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 various exercises using the "Hourly Analysis Program (HAP) Software" and "Elite CHVAC Simulator".

Hourly Analysis Program (HAP) Software



Elite CHVAC Simulator

Course Coordinator

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