SCEM Combined Heat and Power Systems

**** Supported by e2i ****

Introduction

SCEM is a formal training and certification system that offers competent, relevant and holistic training for Energy managers in Singapore. It aims to build competent technical capacity in support of the energy service sector.

Designed for engineering professionals who intend to build their careers as energy managers, the programme gives a thorough understanding of the key energy issues in the industry sector. It will help participants develop the technical skills and competence needed to manage energy services in the organization they serve.

The Combined Heat and Power (CHP) systems produce more than one useful effect simultaneously by making use of recovered waste heat from the same fuel source. Based on number of useful effects produced, the CHP systems can be a co-generation (two useful effects) or a tri-generation (three useful effects) system. The useful effects are electricity, heating and cooling. The use of these sustainable CHP systems versus conventional electrical power plants and fuel fired boilers can reduce the energy loss resulting in reduced emission and environmental impact. These combined power plants can also be made to function as co-generation or trigeneration systems producing two or three useful effects simultaneously. In Singapore, more than 80% of the power generated uses natural gas-fired combined cycle power plants due to their proven superior thermal efficiency and a relatively cleaner fuel. Also, a significant portion of the heat and power requirement in the industrial sector can be supported with this kind of on-site co-generation systems.

This module is tailored in the backdrop of the above and aims to provide comprehensive fundamentals of Combined Heat and Power Plants targeted at industrial professionals operating under the Singapore regulatory requirements.

Objectives

- Understand the fundamental thermodynamic concepts behind CHP systems
- Analyze energy performance characteristics of CHP systems
- Identify and analyze energy savings opportunities and operate the system in an energy efficient manner
- Select and size CHP systems for an industrial set-up with different heat and power requirements
- Conduct feasibility and cost benefit analysis for a CHP proposal

Details

Date : 04, 05, 06 October 2021
(Mon – Wed)

Time : 9am – 6pm

Duration: Consecutive 3 Days per module

Venue : IES Academy@Jurong East

CPD : PDU / PDU (CEng) TBC

Fee (include GST): $963.00

E-certificate of Attendance will be awarded to participants who have completed the course survey and assessment.

Target Audience

Engineering professionals who intend to build their careers as energy managers

IES Academy@Jurong East
80 Jurong East Street 21, #04-10
Devan Nair Institute for Employment and Employability, Singapore 609607

Contact Person: Jessie Tan
DID: 6461 1250| Main Line: 6463 9211
E-mail: jessie.tan@iesnet.org.sg

Course Outline

- Combined Heat and Power (CHP) system basics
- Thermodynamic concepts of CHP
- Gas and vapour power cycles
- CHP Prime mover technologies
- Feasibility analysis for CHP systems
- Local regulatory issues for CHP

Trainers' Profile

1. **Dr. Lal Jayamaha** is the author of two book titled "Energy Efficient Building Systems" and "Energy Efficient Industrial Systems" published by McGraw-Hill, USA and the founder of LJ Energy Pte Ltd which is one of the leading ESCOs (Energy Service Companies) in Singapore. He graduated from Queen Mary College, University of London with a First Class Honours degree in Mechanical Engineering in 1982. Thereafter he worked for 8 years in Industry including 5 years for multi-national Unilever. In 1990 he was awarded a Research Scholarship by the National University of Singapore to undertake a research leading to a MEng degree. After completing his Masters degree in 1993 he continued his research in heat transfer relating to building heat gain and building energy performance and was awarded a PhD. degree in 1997. After completing his PhD, he specialised in the area of Energy Management and has been the team leader for many major energy audits and energy retrofits carried out in Singapore and the region. He is an EEO Assessor, Professional Engineer (PE - Singapore), a Chartered Engineer (UK and Singapore) and a Qualified Energy Services Specialist (QuESS) for conducting Energy Audits. He is also a member of the Institution of Mechanical Engineers, UK and the American Society for Heating, Refrigerating and Air-conditioning Engineers (ASHRAE).

2. **Dr. Jahangeer K. Abdul Halim** a registered Professional Engineer (Mechanical) with the Professional Engineer Board Singapore, graduated with a Master of Science (M.Sc.) in Mechanical Engineering from National University of Singapore in 1998. He was awarded a Research Scholarship by the National University of Singapore (NUS) in 1999 to undertake a research project on solar energy and was awarded a Master of Engineering (M.Eng.) degree in 2002. After completing his M.Eng. degree, he continued with research and teaching at NUS and his research on evaporatively-cooled condensers of air-conditioning systems led to the award of a PhD. degree in 2013.

   Dr. Jahangeer's areas of specialization include air-conditioning and mechanical ventilation systems, combined heat and power systems, steam technologies, steam turbines and boiler systems, compressed air system optimization, building energy simulation and energy optimization. He has also authored chapters in several technical books and research papers in international peer-reviewed journals. He is also an SCEM (Singapore Certified Energy Manager). He is also an EEO Assessor and a Senior Member of Institute of Engineers Singapore (IES since 1999.

   Currently, Dr Jahangeer is a Technical Director with LJ Energy Pte Ltd. (an accredited ESCO) providing consultancy services for mechanical and energy Systems including large scale trigeneration systems, boilers and compressed air systems. Dr Jahangeer has also been providing training for local and international practising engineers from the mechanical and energy services sector including the Singapore Certified Energy Manager (SCEM) professional candidates. He along with his colleague has already trained more than 1000 industrial professionals as Singapore Certified Energy Managers (SCEMs) since the inception of the SCEM.

THE SINGAPORE CERTIFIED ENERGY MANAGER (SCEM) TRAINING PROGRAMME

Candidates are required to take **4 core** and **2 elective** modules and take the individual exams within 36 months. Candidates are required to pass all examinations for all modules in order to apply for the SCEM certification.

SCEM Energy Management and Economics is one of the core modules mention below:

Core Modules

- Motor Driven Systems (MDS)
- Air-Conditioning and Mechanical Ventilation Systems (ACMV)
- Energy Measurement and Audit (EMA)
- Energy Management and Economics (EME)

Electives

- Steam and Compressed Air Systems (SCAS)
- Combined Heat and Power Systems (CHP)
- Building Envelope and Lighting Systems (BELS)
- Integrative Design for Energy Efficiency (IDEE)
- Energy Recovery and Reuse (ERR)

*Candidate who has completed the Green Mark Manager course offered by BCA Academy may be exempted from taking 1 elective module.

To register for the SCEM full programme (Professional Level - 4 Cores & 2 Electives) and application for e2i funding, please e-mail **jessie.tan@iesnet.org.sg** for more details.

If you just want to register for this CHP module, please fill up the registration form below.

REGISTRATION FORM

SCEM Combined Heat and Power Systems

**** Supported by e2i ****

Date of Course:	**04, 05, 06 October 2021 Monday - Wednesday**
Course Time:	**9.00am to 6.00pm (Consecutive 3 Days per module)**
Venue:	**IESA Academy@Jurong East**
Course Fee:	**$963.00 (Inclusive of GST)**
CPD Programme:	**PDU / PDU (CEng) TBC**
Course Coordinator:	**Jessie Tan** **Tel: 6461 1250** **Email: jessie.tan@iesnet.org.sg**
Closing Date:	**First come first serve or when class is full**

Participant's Details:

Name (As per NRIC):	Mr/Ms/Mrs/Dr				
NRIC/FIN:		**Designation:**			
Gender:	**Male / Female**	**Nationality:**	Singaporean / Permanent Resident /Others:		
Company Name:					
Address:					
			Postal Code:		
Office No:		**Mobile:**		**PE / SCEM No:**	
Email:		**Qualification:**			

Contact Person (HR/Accounts Department)

Name:			
Contact No:		**Designation:**	
Email:			
Address (For mailing of invoice):			
Payment:	**Nets/Cheque No:**		**Amount:**

Cheque to be made payable to IES ACADEMY PTE LTD

- **Written notice via email to course coordinator is required for Cancellation or Withdrawal from Course, 7 working days prior to course date**
- **Course fees are inclusive of 7% GST, course materials and Halal refreshments**
- **Certificate of Attendance will be issued to paid participants with 100% Attendance**
- **No-Show of participant would not be accepted as reason for withdrawal or cancellation from course. Thus course fee is chargeable**

Acceptance of Terms & Conditions for Registration of IES Academy Courses / Events
I have read, deemed understood and accept the Terms & Conditions of IES Academy courses and events.

Name:

Signature: **Date:**

TERMS & CONDITIONS FOR COURSE REGISTRATION

Registration

Any registration, whether online, fax or by email, will based on a ***first-come-first-served basis*** and will only be confirmed upon receipt of full payment by IES ACADEMY PTE LTD unless otherwise invoice to company.
All registrations must be submitted with duly completed registration form.

Closing Date & Payment

The closing date of the event will be 1 week prior to event commencement date. Cheques should be crossed 'A/C payee only' and made payable to **'IES ACADEMY PTE LTD'**, with the ***Date of event, Title of The Event and participants' name indicated clearly on the back of the cheque***, and post to:

Attn: Jessie Tan
IES Academy@Jurong East
80 Jurong East Street 21 #04-10
Devan Nair Institute for Employment & Employability
Singapore 609607

Confirmation of Registration

Confirmation of registration will be given at least one week before the commencement date of event via email. ***If you do not receive the said confirmation email, you are required to contact IES Academy at 6463 9211 during office hours.***
IESA reserves the right to allow only confirmed and paid registrants to attend the Event.

Withdrawals/Refunds of Fees

- Written notice ***at least 1 week in advance*** before the commencement of the event
- Full course fee shall be refunded subjected to 4.5% transaction charge
- **NO** refund otherwise.
- No-show of participant would not be accepted as a valid reason for withdrawal/refund.
- One time replacement is allowed only if written notice is received by us at least 1 week before the commencement of the event. However, when an IES member is replaced by a non-member, the participant has to pay the difference in the relevant fees.

Cancellation/Postponement

Changes in Venue, Dates, Time and Speakers for the Events can occur due to unforeseen circumstances. IESA reserves the full rights to cancel or postpone the Event under such circumstances without prior reasons. Every effort, however, will be made to inform the participants or contact person of any cancellation or postponement.

Fees will be refunded in FULL if any Event is cancelled by IESA.

Personal Data Protection Act

By registration, you consent to the processing by Institution of Engineers, Singapore of personal data, including your sensitive personal data as defined in the Data Protection Act 2014 for the proper purposes of Institution of Engineers, Singapore (IES). You undertake to observe the provisions of the Data Protection Act 2014 in relation to any personal data you may hold and process as a Members of Institution of Engineers, Singapore, and you agree to indemnify Institution of Engineers, Singapore from liability for any claims or damages that may arise from the processing of this data. For more information kindly refer to here.

Enquiries

For further enquiries, please contact IESA general office at Tel: 6463 9211.