

# INDUSTRIAL THERMAL ENERGY AUDIT AND ANALYSIS (ITEA)

[ 2 Days, 16 Hours Total ] Online Live Training with Instructor



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Training Method & Fee	Date	Requirement
<b>Method:</b> Online training <b>Course Fee:</b> RM1200/pax <b>Group/student Fee:</b> Refer to website/contact us	3 - 4 Feb 2021	stable internet microphone webcam
<b>Training Summary</b> <p>Thermal energy efficiency improvement typically offers the biggest scope for energy cost saving in industry. Thermal energy audit involves systematic and detailed analysis of the performance of thermal energy equipment and systems of a facility, and to benchmark against the system's design performance.</p> <p>This course will equip participants with practical concepts, principles, tools and systematic techniques to analyse the thermal energy efficiency of boiler systems, and effectively apply the tools and techniques for thermal energy cost saving measures.</p>		<b>Course Objective</b> <ul style="list-style-type: none"> <li>(a) Apply the insights, principles and the big picture of industrial energy audit.</li> <li>(b) Perform material and energy balances for practical industrial thermal energy analysis.</li> <li>(c) Apply the tools to analyse steam properties.</li> <li>(d) Apply the key criteria for fuel selection and combustion</li> <li>(e) Determine boiler efficiency (direct and indirect method)</li> <li>(f) Use boiler system calculator/spreadsheet to explore improvement opportunities</li> <li>(g) Apply no cost, low cost and practical strategies to improve boiler efficiency.</li> </ul>
<b>Learning Benefit</b> <ul style="list-style-type: none"> <li>1. Improve the energy efficiency of a facility's boiler/steam system</li> <li>2. Reduce the facility's thermal energy costs and GHG emissions.</li> <li>3. Prepare the organisation for setting up of energy management system</li> <li>4. Raise competitiveness through thermal energy management expertise</li> </ul>		<b>Course Outline</b> <ul style="list-style-type: none"> <li>- The Big Picture of Industrial Thermal Energy Management</li> <li>- Energy Balances – From Principle to Practice</li> <li>- Steam properties</li> <li>- Fuel and Combustion</li> <li>- Overview of boiler</li> <li>- Direct and indirect efficiency of boiler</li> <li>- Analysis and application of improvement measures</li> </ul>



### Trainer 1

Prof Ir Ts Dr Zainuddin  
Abdul Manan

Prof Ir Ts Dr Zainuddin Abdul Manan is a professor of chemical engineering, the founding director of UTM Process Systems Engineering Centre (PROSPECT), founding Dean of the UTM Faculty of Chemical and Energy Engineering, founder of UTM Sustainable Energy Management Program, and the founder of OPTIMISE Sdn Bhd, a UTM spin-off company. He began his career as an engineer in PETRONAS and Hume Industries and has been an academic leader, educator, researcher, consultant and professional coach for 25 years. He completed over 100 R & D & consultancy projects serving local and multinational companies, has numerous patents and more than 450 publications that include 15 books/chapters, 200 refereed journals and 220 conference proceedings on energy and resource conservation using process integration techniques. He is a co-author of the globally referred Book on Process Integration and Intensification – Savings Energy, Water and Resources.

Zain is a UK/EU chartered engineer, a Fellow IChemE (UK), a Professional Engineer (PEng), a Professional Technologist, a certified energy manager, a registered electrical energy manager and a certified trainer for ASEAN energy managers. Zain was the winner of Saudi's Prince Sultan International Prize for Water (2008) and was awarded as a Top Research Scientist of Malaysia by the Academy of Science of Malaysia (2013). In 2014, he received the award as UTM Top Researcher, UTM Top Academician and the Honorary Award from Hungary. He has delivered over 400 invited talks in professional courses, conferences and seminars across the world, including the 2014 Imperial College Distinguished Chemical Engineering Sponsored Lecture.

Zain is currently the chair of the EECA (Energy Efficiency and Conservation Act) Thermal Energy drafting committee under the Malaysian Ministry of Energy. He founded and spearheaded the UTM Sustainable Energy Management initiative that led UTM to achieve more than USD 6 million energy savings between 2011 and 2019, and to win the ASEAN Energy Award in 2012.



### Trainer 2

Prof Ir Dr Sharifah Rafidah  
Wan Alwi

Prof Ir Dr Sharifah Rafidah Wan Alwi is the Director of Process Systems Engineering Centre of Universiti Teknologi Malaysia (UTM). Sharifah has been extensively involved in 66 research projects, 23 industrial based projects for various companies and government agencies and has trained engineers from more than 300 companies in the field of sustainable engineering design and management.

She specialises in process systems engineering with emphasis on process integration and resource conservation. She has won numerous awards such as Top Research Scientists Malaysia 2018, Malaysia Research Star Award 2019, 2018 and 2016, ASEAN-US Science Prize for Women 2016, National Young Scientist Award 2015, ASEAN Young Scientist and Technologist Award 2014, IChemE Highly Commended Sir Frederick Warner Prize 2011, Top 5 Global IChemE Young Engineer Award 2009 and Global Green Talents 2009. She is currently the Associate Editor for Journal of Cleaner Production (Q1) and Editorial Board member for Applied Thermal Engineering Journal (Q1). She has filed 15 patents, 25 copyrights and developed 5 software products.

She is the co-founder of UTM Spin-off company called Optimal Systems Engineering Sdn Bhd (OPTIMISE). She has also served as the Chairman for Malaysia IChemE Young Engineer Group (YEG) and is a member of Young Scientist Network, Academy of Sciences Malaysia (YSN-ASM). She is a certified ASEAN Energy Management Scheme (AEMAS) Energy Manager trainer and a Registered Electrical Energy Manager under Malaysia Energy Commission. She is currently the energy advisor for UTM Energy Management System. Due to her various contributions globally and locally, she was promoted as Professor in 2016 at the age of 34 years old by Universiti Teknologi Malaysia.



### Trainer 3

Ir Dr Lim Jeng Shiun

Ir Dr Lim Jeng Shiun is the Products and Services Manager of Process Systems Engineering Centre (PROSPECT), Universiti Teknologi Malaysia. His core expertise is in the area of innovative development and application of process systems engineering techniques for resource conservation, and for energy and carbon planning. Dr Lim has published 82 Scopus indexed articles to date. His Scopus h-index is currently 21 with 1505 citations. He has also been appointed as the guest editor for Special Issue of JCLEPRO and Chemical Engineering Transactions (Scopus indexed).

He is also a professionally Certified Energy Manager, Certified Energy Auditor, Accredited Energy Measurement & Verification Professional and a Registered Electrical Energy Manager certified by Energy Commission of Malaysia. As an engineer in practice, he has applied the output of his research work in consultancy projects for the industrial community. He has been extensively involved in 22 research projects, 11 industrial based projects for various companies and government agencies. The key clients include local industries and multinational companies such as BERNAS, FABER MEDISERVE, SHELL, OLEON in Malaysia and PERTAMINA in Indonesia.

He has assisted those companies identify energy saving opportunities worth millions of dollar through the use of process integration and process systems engineering approach.

In commercialisation, Dr Lim is the cofounder and Director of Products and Services of a UTM Spin-off company. One of his product, e-SMART (an online energy monitoring system), have won the commercialisation grants that worth more than RM 800k.

# Training Registration Form

Course Title	Industrial Thermal Energy Audit and Analysis (ITEA)
Course Date	

Registration Form email to [training@optimalsystems.my](mailto:training@optimalsystems.my)

Registration Type (Please ✓ in appropriate box)

☐

Individual

☐

Company – HRDF Registered

☐

Company – Non HRDF

☐

Government

## PARTICIPANTS' DETAILS

1.	Name			
	Position		Mobile No.	
	Email address		NRIC	
2.	Name			
	Position		Mobile No.	
	Email address		NRIC	
3.	Name			
	Position		Mobile No.	
	Email address		NRIC	
4.	Name			
	Position		Mobile No.	
	Email address		NRIC	

## ORGANIZATION DETAILS

Organization Name			
Organization Address			
PIC Email		PIC Telephone	

**Declaration** (Skip declaration 1 for Individual Registration)

1. I (name)\_\_\_\_\_ agree to send these particular trainees to attend the above training.

2. I agree to make full payment on the course fees stated at the invoice given to Optimal Systems Engineering Sdn Bhd before the training starts at the respective dates.

3. I agree for the course fee of training to be non-refundable but transferable in accordance to Optimise Training Policy, although our trainees withdraw after the confirmation letter has been issued.

By Signing below, I hereby agreed to attend and shall make the necessary payment as stipulated by the invoice from Optimal Systems Engineering. Except for individual registration, the signature below must be from either Chief Executive, Director, General Manager, HR / Training Manager or Assistant Manager.

P.I.C : Mr Axel / Ms Thulasi  
 Numbers : +60167167248 / +075536244  
 Website : [www.optimalsystems.my](http://www.optimalsystems.my)  
 Hours : Sunday - Thursday (9.00am - 5:00pm)

Organization Stamp / Signature\*

# COURSE SCHEDULE

This is a tentative schedule for Industrial Thermal Energy Audit and Analysis (ITEA). Dates and assigned time are subject to changes.

Day 1	
8:30 am - 9:00 am	Attendance & Setup/Troubleshoot
9.00 am - 9.15 am	<b>Course Overview</b>
9.15 am - 10.00 am	<b>The Big Picture of Industrial Thermal Energy Management</b>
10:00 am - 11.30 am	<b>Energy Balances – From Principle to Practice</b>
11.30 am -11.45 am	Short Break
11.45 am - 12.45 pm	<b>Steam properties</b>
12.45 pm - 2.00 pm	Lunch Break
2.00 pm - 4.30 pm	<b>Fuel and Combustion</b>
4.30 pm - 5.00 pm	Discussion

Day 2	
8:30 am - 9:00 am	Attendance & Setup/Troubleshoot
9.00 am - 9.30 am	<b>Overview of boiler</b>
9.30 am - 11.00 am	<b>Direct and indirect efficiency of boiler</b>
11.00 am - 11.15 am	Short Break
11.15 am - 12.30 pm	<b>Analysis and application of improvement measures</b>
12.30 pm - 2.00 pm	Lunch Break
2.00 pm - 4.15 pm	<b>Analysis and application of improvement measures (cont.)</b>
4.15 pm - 4.30 pm	<b>Way forward</b>
4.30 pm - 5.00 pm	Discussion

This schedule is subjected to minor changes by the Organizer without prior notice. For the confirmed tentative schedule, kindly seek from our staff 5 days before the training.

For the latest training dates: kindly refer to [bit.do/optimise-training](https://bit.do/optimise-training)

**For online registration:** go to [bit.do/training-register](https://bit.do/training-register)

**For offline registration:** Fill up form and email to [training@optimalsystems.my](mailto:training@optimalsystems.my)