

THERMAL ENERGY RECOVERY TECHNOLOGIST (TERT) – PENJANA GIG INITIATIVE

[6 Days, 48 Hours Total] Online Live Training with Instructor



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[BIT.DO/TERT-PENJANA-REGISTER](https://bit.do/tert-penjana-register)

'Fully Funded Course!'

'Register now to be a Thermal Energy Recovery Freelancer!'

Training	Date	Requirement
Method: Online training Course Fee: Fully funded by Penjana GIG (worth RM3500)	28 Feb - 28 March 2021 (non-consecutive days)	stable internet microphone webcam **refer to registration form

Training Summary

Process integration using pinch analysis provides facility and site planners, plant designers and process engineers with practical knowledge, skills and step-wise method for the integrated optimal planning, design and retrofit of processes, facilities and manufacturing sites to promote industrial symbiosis and achieve triple-bottom line benefits of minimised utilities (e.g. thermal energy), minimised costs (operating, maintenance and investment costs) and minimised wastes (CO₂, gaseous emissions).

This Thermal Energy Recovery Technologist (TERT) workshop covers our copyrighted and patented trade mark technologies on Process Integration Based On Pinch Analysis that delves deep into process operation covering furnaces, reactors, separators, heaters, coolers and heat exchanger network retrofit.

Real Examples from Past Projects

1. USD 12.8 million/year on energy savings by Retrofit of Heat Recovery System (Refinery)
2. USD 4.1 million/year on energy savings by Total Site Heat Integration Retrofit Study (Middle Distillate)
3. USD 0.75 million/year on energy and water recovery savings (Oleochemical)

About Penjana GIG Initiative

The Gerak Insan Gemilang (GIG) is aimed at facilitating Malaysians with specific skills and knowledge to enable them to become freelancers and generating better income. The objectives of GIG initiative are:

1. To train Malaysians in specific skill areas which enable them to venture into gig economic segment.
2. Ensure they are well-trained in the digital skills.
3. Fill the current unemployment gap whilst simultaneously encourage them to be part of the gig economy.

Requirements

1. Only Malaysians are eligible to participate in GIG initiative.
2. Each trainee is only allowed to attend one course under the GIG initiative.
3. Trainees must complete their tasks, assignments, projects and exam (if any) as required and actively participate in all practical exercises, presentations and role play as directed by the trainers.
4. Only accept applicants from Engineering related degree and diploma (refer to registration form)

Entitlement and Benefits

1. Fully sponsored training by HRDF

Course Objective

- The minimum heating/cooling needs (energy targets) of a process.
- The scope for minimising energy, water and emissions.
- The optimal mix of utilities (LP/MP/HP steam, fuel, water) in a plant.
- The steps and options to reduce utilities with no/low investment.
- The scope to maximise energy savings via cogeneration in a facility.
- The practical steps in energy and emission reduction projects.
- Maximise utility savings with minimum changes to the existing plant.
- Design/improve a process to minimise energy and emissions.
- The application of TERT Level 1 and 2 knowledge on industrial case study.

Past Project Testimonials

- In the light of Pinch Analysis development, process plants should consider, retrofit beyond energy audit". - **(Maintenance Manager, Palm Oleo)**
- "I personally appreciate the practical case studies and work sessions and the software/ programme developed by PROSPECT of UTM - **(Utility Engineer, Petronas Gas Berhad)**
- "A very useful tool to redesign or troubleshoot heat exchanger/ water network to save utility cost" - **(Energy Audit Engineer, GreenTech Malaysia)**
- "An efficient technique for analysis and reduction of utilities leading to significant savings" - **(Senior Process Engineer, Riau Pulp and Paper Mill)**
- "I am impressed on the power of pinch for energy and utility reductions" - **(Senior Process Engineer, Shell Middle Distillate Synthesis)**

Reason to Join this Course

If you want to become a Thermal Energy Auditor for an Energy Service Company or offer this service as a freelancer.

- Equip yourself as a TERT to manage thermal energy
The anticipated enactment of Malaysia Energy Efficiency & Conservation Act (EECA) shall unlock opportunities for energy managers with competency to audit, manage and optimise thermal energy systems apart from electrical energy.
- Gain competency to perform practical retrofit of existing facilities
Learn from certified experts and practitioners on how to perform optimal thermal energy recovery analysis to retrofit existing facilities practically, and gain the support of top management to achieve triple bottom line benefits.
- Offer value-added energy audit services for the ASEAN community
You will be able to offer value-added energy audit services to your customer under the newly announced Energy Audit Conditional Grant (EACG) which supports energy auditing of both electrical and thermal energy. Implementation of Energy Management System covering thermal and electrical energy in region is expected to significantly increase the demand for thermal energy analysis experts in Malaysia and across ASEAN.

If thermal energy is the leading energy cost in your manufacturing site.

- Huge potential reduction in energy bills from thermal heat recovery
Over 7000 successful process integration applications worldwide, including our project experiences have resulted in thermal energy savings of between 10 to 50%, and payback period of less than 3 years. Our recent petroleum refinery retrofit project for example amassed an annual savings of USD 12 Million.
- Statistics and our experience have shown that thermal energy may account for more than two-third of total energy usage and cost in industry, opening significant scope for cost savings through heat recovery.

Our experience shows that plant renovation, plant expansion, addition of new product lines, consideration of total site and area-wide integration could lead to ample energy cost saving potentials.

Training Dates:

1. 28 Feb - 2 March 2021 : Thermal Energy Recovery Technologist – Level 1: Basic Level
2. 14-15 March 2021 : Thermal Energy Recovery Technologist – Level 2: Advanced Level
3. 28 March 2021 : Thermal Energy Recovery Technologist – Level 3: Application

** This TERT course consists of Part 1-3, participant must attend all 3 parts at their respective dates. The dates stated above are subjected to changes, for the latest dates kindly go to bit.do/optimize-training.



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 Ts Dr Sharifah
Rafidah Wan Alwi

Prof Ir Ts Dr Sharifah Rafidah Wan Alwi, PEng, MIEM, CEng, MICheE, is the Director of Process Systems Engineering Centre (PROSPECT) of Universiti Teknologi Malaysia (UTM). She holds a BEng in Chemical Engineering from UMIST, UK and PhD in Chemical Engineering from 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 200 companies in the field of energy and water minimisation.

Dr Sharifah is an expert in various Pinch Analysis techniques for the recovery of heat, water, mass, CO₂, waste gases and hybrid power system. She is an expert Pinch consultant for various industries and is among the leading researchers in Pinch Analysis technique development. Her work has been filed for patents and featured in leading national and international chemical and engineering journals, magazines and conferences. 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.

Together with her team, they have developed various Pinch software including Optimal Heat, Optimal Water and Optimal Audit. Sharifah has won various international and national awards such as Green Talents 2009 (Germany), IChemE Highly Commended Sir Frederick Warner Prize 2011 (UK), ASEAN Young Scientist and Technologist Award 2014, National Young Scientist Award 2015, ASEAN-US Science Prize for Women 2016 in Energy Sustainability, Malaysia Research Star Award 2016, 2018, 2019 and Top Research Scientists Malaysia 2018. 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. Dr Sharifah is also the Associate Editor for Journal of Cleaner Production.



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.

COURSE SCHEDULE

This is a tentative schedule for Thermal Energy Recovery Technologist – Level 1: Basic Level. Dates and assigned time are subject to changes.

28 Feb 2021 (Day 1)	
8.30 am - 8.45 am	Participant Registration & Troubleshoot
8.45 am - 9.15 am	Online system briefing and familiarisation Ice Breaking
9.15 am - 10.15 am	Maximising Energy and Resource Cost Savings in Industry using Pinch Analysis
10.15 am - 10.45 am	Process Integration based on Pinch Analysis - The Basic Concepts
10.45 am - 11.00 am	Break
11.00 am - 1.00 pm	Setting the Minimum Energy Targets (Energy Targeting) using Composite Curves with working session
1.00 pm - 2.15 pm	Lunch and Prayer Break
2.15 pm - 3.15 pm	Significance of Composite Curves
3.15 pm - 3.30 pm	Break
3.30 pm - 5.00 pm	Energy Targeting using Problem Table Approach (PTA) with working session

1 March 2021 (Day 2)	
8.30 am - 9.00 am	Participant Registration & Troubleshoot
9.00 am - 9.30 am	Online Quiz
9.30 am - 10.30 am	Extracting information from Composite Curves and PTA
10.30 am - 10.45 am	Break
10.45 am - 1.00 pm	Design of Heat Recovery Network (HRN) by using Grid Diagram + Working Session
1.00 pm - 2.15 pm	Lunch and Prayer Break
2.15 pm - 3.15 pm	Transferring Grid Diagram back to Flowsheet + Working Session
3.15 pm - 3.30 pm	Break
3.30 pm - 5.00 pm	Stream Data Extraction (SDE) + Working Session

For the latest training dates: kindly refer to bit.do/optimise-training

Online registration: bit.do/tert-penjana-register

Contact us: +6016-716 7248

Email to us: training@optimalsystems.my

COURSE SCHEDULE

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2 March 2021 (Day 3)	
8.30 am - 9.00 am	Tutorial
9.00 am - 9.30 am	Online Quiz
9.30 am - 11.00 am	Design of Complex HRN (with Stream Splitting)
11.00 am - 11.15 am	Break
11.15 am - 12.15 pm	Minimum Units Targets
12.15 pm - 1.00 pm	Network Evolution
1.00 pm - 2.15 pm	Lunch and Prayer Break
2.15 pm - 3.15 pm	Multiple Utility Targeting and Optimisation using Grand Composite Curve (GCC)
3.15 pm - 3.30 pm	Break
3.30 pm - 4.30 pm	Working Session
4.30 pm - 5.00 pm	Closing

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COURSE SCHEDULE

This is a tentative schedule for Thermal Energy Recovery Technologist – Level 2: Advanced Level. Dates and assigned time are subject to changes.

14 March 2021 (Day 4)	
8.30 am - 8.45 am	Participant Registration & Troubleshoot
8.45 am - 9.15 am	Online system briefing and familiarisation Ice Breaking
9.15 am - 10.15 am	Advanced Process Integration – Optimum DTmin
10.15 am - 11.15 am	Advanced Process Integration – Process Modification
11.15 am - 11.30 am	Break
11.30 am - 1.00 pm	Advanced Process Integration – Combined Heat & Power
1.00 pm - 2.15 pm	Lunch and Prayer Break
2.15 pm - 4.15 pm	Advanced Process Integration – Total Site Heat Integration
4.15 pm - 4.30 pm	Break
4.30 pm - 5.00 pm	Optimal Heat Demo

15 March 2021 (Day 5)	
8.30 am - 9.00 am	Tutorial
09.00 am - 10.15 am	Step-wise retrofit procedure
10.15 am - 10.30 am	Break
10.30 am - 1.00 pm	Retrofit Analysis + Working Session
1.00 pm - 2.15 pm	Lunch and Prayer Break
2.15 pm - 3.15 pm	Economic Analysis and Cost Benefit Analysis
3.15 pm - 3.30 pm	Break
3.30 pm - 4.30 pm	Retrofit Case Study
4.30 pm - 5.00 pm	Closing

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COURSE SCHEDULE

This is a tentative schedule for Thermal Energy Recovery Technologist – Level 3: Application. Dates and assigned time are subject to changes.

28 March 2021 (Day 6)	
08.30 am - 08.45 am	Participant Registration & Troubleshoot
09.00 am - 12.00 pm	Online Exam
12.00 pm - 2.00 pm	Lunch and Prayer Break
2.00 pm - 4.30 pm	Industrial Project Case Study Presentation
4.30 pm - 5.00 pm	Closing

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