Solar Thermal Process Engineering Training Course

Professional Development Training Course Outline

Category	General Training	**Duration**	5 Days
Base Fee	$1,500 USD	**Delivery Mode**	Online / On-site Hybrid

Course Introduction

The Solar Thermal Process Engineering Training course is meticulously designed for engineers, scientists, and energy professionals seeking to advance their expertise in solar energy utilization, thermal process optimization, and sustainable industrial applications. This program emphasizes hands-on learning, case-driven analysis, and the latest innovations in renewable energy systems, concentrated solar power (CSP), and energy-efficient process design. Participants will gain critical skills to design, optimize, and troubleshoot solar thermal systems across diverse industrial applications, from chemical processing to desalination and food processing.

This course bridges the gap between theoretical knowledge and practical implementation, equipping professionals to harness the power of solar thermal technologies for maximum efficiency and reduced carbon footprint. By integrating process simulation, energy management, and advanced heat transfer techniques, participants will be empowered to drive sustainable energy solutions, implement green process engineering, and contribute to the global renewable energy transition.

Programme Curriculum

Solar Thermal Process Engineering Training Course

Introduction

The Solar Thermal Process Engineering Training course is meticulously designed for engineers, scientists, and energy professionals seeking to advance their expertise in solar energy utilization, thermal process optimization, and sustainable industrial applications. This program emphasizes hands-on learning, case-driven analysis, and the latest innovations in renewable energy systems, concentrated solar power (CSP), and energy-efficient process design. Participants will gain critical skills to design, optimize, and troubleshoot solar thermal systems across diverse industrial applications, from chemical processing to desalination and food processing.

This course bridges the gap between theoretical knowledge and practical implementation, equipping professionals to harness the power of solar thermal technologies for maximum efficiency and reduced carbon footprint. By integrating process simulation, energy management, and advanced heat transfer techniques, participants will be empowered to drive sustainable energy solutions, implement green process engineering, and contribute to the global renewable energy transition.

Course Duration

5 days

Course Objectives

1. Master solar thermal energy fundamentals and system design principles.
2. Analyze and optimize industrial heat transfer processes using solar energy.
3. Evaluate Concentrated Solar Power (CSP) technologies for industrial applications.
4. Design solar-assisted process systems for chemical, food, and water industries.
5. Implement energy efficiency strategies in thermal process engineering.
6. Integrate thermal energy storage solutions in solar processes.
7. Conduct process simulation and modeling for solar thermal systems.
8. Apply sustainability and carbon reduction strategies in industrial settings.
9. Develop cost-effective solar thermal solutions for commercial and industrial use.
10. Solve real-world case studies involving solar thermal applications.
11. Assess renewable energy policies and incentives for project planning.
12. Enhance skills in predictive maintenance and operational optimization.
13. Foster innovation in green process engineering and energy transition initiatives.

Target Audience

1. Process Engineers
2. Mechanical Engineers
3. Energy Consultants
4. Chemical Engineers
5. Renewable Energy Professionals
6. Industrial Plant Managers
7. Environmental Engineers
8. Researchers & Academicians

Course Modules

Module 1: Introduction to Solar Thermal Engineering

- Overview of solar thermal energy concepts
- Types of solar collectors-flat plate, evacuated tube, CSP
- Heat transfer principles in solar applications
- Solar resource assessment and energy yield estimation
- Case Study: Industrial steam generation using CSP

Module 2: Thermal Process Design and Simulation

- Fundamentals of process heat integration
- Energy balance and thermal load analysis
- Process simulation using advanced software tools

- Optimization techniques for heat recovery
- Case Study: Optimizing a solar-assisted chemical reactor

Module 3: Concentrated Solar Power (CSP) Technologies

- Parabolic trough, Fresnel, and solar tower systems
- Design parameters and operational principles
- Thermal efficiency improvement methods
- Maintenance and performance monitoring
- Case Study: CSP for large-scale industrial steam production

Module 4: Heat Transfer & Thermal Storage Solutions

- Conductive, convective, and radiative heat transfer in solar systems
- Thermal energy storage technologies
- Integration of TES with industrial processes
- Modeling transient thermal behavior
- Case Study: Food processing with solar thermal storage integration

Module 5: Solar-Assisted Industrial Applications

- Solar thermal applications in chemical, food, and textile industries
- Water desalination using solar thermal energy
- Process integration strategies
- Efficiency assessment and optimization
- Case Study: Solar-assisted desalination plant design

Module 6: Sustainability & Carbon Reduction Strategies

- Life cycle assessment of solar thermal systems
- Carbon footprint and energy savings analysis
- Environmental impact evaluation
- Regulatory standards and compliance
- Case Study: Implementing carbon-neutral solar process solutions

Module 7: Cost Analysis & Project Feasibility

- Capital and operational cost estimation
- Economic analysis and payback period calculation
- Incentives, grants, and renewable energy policies
- Risk assessment and mitigation strategies
- Case Study: Feasibility study for a solar thermal industrial plant

Module 8: Advanced Trends & Innovation in Solar Thermal Engineering

- Smart solar thermal systems with IoT integration
- Hybrid renewable energy systems
- Predictive maintenance and performance analytics
- Emerging materials and collector technologies
- Case Study: Industry 4.0 integration in solar thermal process systems

Training Methodology

This course employs a participatory and hands-on approach to ensure practical learning, including:

- Interactive lectures and presentations.
- Group discussions and brainstorming sessions.
- Hands-on exercises using real-world datasets.
- Role-playing and scenario-based simulations.
- Analysis of case studies to bridge theory and practice.
- Peer-to-peer learning and networking.
- Expert-led Q&A sessions.
- Continuous feedback and personalized guidance.

Register as a group from 3 participants for a Discount

Send us an email: info@fineskilltrainingcenter.org or call *+254769199797*

Certification

Upon successful completion of this training, participants will be issued with a globally- recognized certificate.

Tailor-Made Course

We also offer tailor-made courses based on your needs.

Key Notes

a. The participant must be conversant with English.

b. Upon completion of training the participant will be issued with an Authorized Training Certificate

c. Course duration is flexible and the contents can be modified to fit any number of days.

d. The course fee includes facilitation training materials, 2 coffee breaks, buffet lunch and A Certificate upon successful completion of Training.

e. One-year post-training support Consultation and Coaching provided after the course.

f. Payment should be done at least a week before commence of the training, to Fineskill Training Center account, as indicated in the invoice so as to enable us prepare better for you.

Upcoming Scheduled Sessions

Start Date	End Date	Location	Price
23 Nov 2026	27 Nov 2026	Online	$1,000
23 Nov 2026	27 Nov 2026	Physical	$1,500
23 Nov 2026	27 Nov 2026	Physical	$3,000
23 Nov 2026	27 Nov 2026	Physical	$3,000

Start Date	End Date	Location	Price
23 Nov 2026	27 Nov 2026	Physical	$6,000
23 Nov 2026	27 Nov 2026	Physical	$4,500
23 Nov 2026	27 Nov 2026	Physical	$6,000
23 Nov 2026	27 Nov 2026	Physical	$6,000

Ready to enroll or request a customized program? Book online or contact us:

Register Online Now

Email: info@fineskilltrainingcenter.com | Website: www.fineskilltrainingcenter.com