HSLU Lucerne University of Applied Sciences and Arts

CC Thermal Energy Systems and Process Engineering
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Course Information

Online Course «Energy Optimization with Pinch Analysis» (EOPA)

Target Groups	Experts from the fields of chemical, process and environmental engineering, energy technology and energy consulting. People responsible for energy management, sustainability, production and infrastructure of industrial companies and SMEs. Government representatives.		
Learning Goals	The participants understand the fundamentals and application of the pinch method and are able to systematically analyze and optimize industrial processes and their infrastructure systems with the PinCH 4.0 software.		
Duration	6 half days in May/June 2024, each from 16:00 – 20:00 (CET), incl. 30 minutes break with an additional 6 question periods		
Course Format	Online course in six blocks, «Problem-based Learning». The focus is to work on practical examples with the PinCH software.		
Upon Course Completion	Course certificate		
Instructors	Team from the Swiss Federal Office of Energy «Prozessintegration/PinCH» Center of the Lucerne University of Applied Sciences and Arts: Don Olsen, Dr. Benjamin Ong, and Prof. Dr. Beat Wellig		
Language	English		
Half Day 1	Fundamentals of the Pinch Method	Wed, 22.05.2024	16:00 – 20:00
Half Day 2	Definition of Process Requirements	Wed, 29.05. 2024	16:00 – 20:00
Half Day 3	Optimizing Energy Supply Systems	Wed, 05.06. 2024	16:00 – 20:00
Half Day 4	Pinch Analysis for Multiple Processes/Operating Cases	Wed, 12.06. 2024	16:00 – 20:00
Half Day 5	Pinch Analysis of Batch Processes	Wed, 19.06. 2024	16:00 – 20:00
Half Day 6	Integration of Thermal Energy Storage	Wed, 26.06. 2024	16:00 – 20:00
Notes	Times are given in Central European Time (CET) and are selected to accommodate participants in the western hemisphere. Depending on interest, a course for the eastern hemisphere may be held at a later date.The teaching blocks are recorded and made available for review afterwards.		
Question Period	There will be 6 question periods provided to answer questions about the subject matter and the PinCH software. Participation is voluntary and only serves to clarify open questions; no new material is taught. Dates and time: Fr 24.05. / Fr 31.05. / Fr 07.06. / Fr 14.06. / Fr 21.06. / Fr 28.06. / at 17:30 – 18:30 (CET)		
Costs	The cost of the course is CHF 2'200.-. A six month time-limited full version of PinCH 4.0 is included.		
Contact	pinch@hslu.ch or Donald Olsen, Tel. 041 349 35 37, E-Mail donald.olsen@hslu.ch		
Registration	By E-Mail at pinch@hslu.ch. Registration deadline is Wednesday, 08.05.2024. In order to offer the best possible support during online lessons, the number of participants is limited.		

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Content of each Learning Block

Wednesday 22 May 2024	**Fundamentals of the Pinch Method** • Refresher Energy and Process Engineering: Mass, Component and Energy Balances, Heat Transfer • Process Representation in the Composite Curves, Investment and Operational Costs • Energy and Cost Targets
Wednesday 29. May 2024	**Definition of Process Requirements** • Design of Heat Exchanger Networks (HEN) • Energy Modelling, Principles of Data Extraction • Demonstration of «E-Module» (Excel Based Tools for Data Extraction)
Wednesday 05. June 2024	**Optimization Energy Supply Systems** • Grand Composite Curves • Optimal Use of Heating and Cooling Systems (Utilities): Steam, Refrigeration, etc. • Integration of Energy Conversion Units (ECUs) using a Heat Pump as Example
Wednesday 12. June 2024	**Pinch Analysis of Multiple Processes/Operating Cases** • Heat Recovery Potential between Processes • Energy Modelling, Energy and Cost Targets for Processes with Multiple Operating Cases • Layout of Heat Exchanger Networks based on Different Design Types
Wednesday 19. June 2024	**Pinch Analysis of Batch Processes** • Energy Modelling of Discontinuous Processes • Introduction to Different Calculation Methods: Time Slice Model, Time Average Model, etc. • Optimization using Direct Heat Recovery
Wednesday 26. June 2024	**Integration of Thermal Energy Storage** • Fundamentals of Thermal Energy Storage and their Integration • Indirect Heat Recovery Based on the Indirect Source and Sink Profiles (ISSP) • Design of Heat Exchanger and Storage Networks (HESN)