ME-602

Modelling, optimisation, design and analysis of integrated energy systems

Maréchal François

Cursus	Sem.	Type
Energy		Opt.

Language of teaching	English
Credits	2
Session	
Exam	Multiple
Workload	60h
Hours	**28**
Lecture	14
Practical work	14
Number of positions	

Frequency

Every year

Remark

Next time: April 2-5, 2024 – EPFL Wallis

Summary

The student will learn advanced concepts in the field of process integration, process modeling and optimization for the design of integrated energy systems: Life cycle energy analysis.

Content

- Advanced process integration techniques based on mixed integer programming for site scale energy system integration.
- Integration of advanced energy conversion technologies including cogeneration, heat pumps and refrigeration systems in industrial processes and urban communities.
- Combined integration of heat and water for the design of integrated system.
- Process integration of batch and discontinuous processes.
- Definition of objective functions based on life cycle & energy analysis.
- Multi-objective optimization including energetic, environmental and economic parameters.
- Application to the design of integrated energy systems: zero emission plants, advanced cycles including combined cycles, thermal solar plants, hybrid solar combined cycles.

Note

EPFL-Wallis, room Mattemark I19.N3.20

Learning Prerequisites

Recommended courses

Process integration (advanced energy systems), modeling and optimization of energy systems, thermodynamics, basic in optimization techniques

Assessment methods

Oral presentation and project report

Resources

Moodle Link

- https://go.epfl.ch/ME-602