



LUND UNIVERSITY

International Institute for
Industrial Environmental Economics

Course Curriculum for IMEN14 Principles of Technical Systems

1. General information

Course code: IMEN14

Course name: Principles of Technical Systems

Main field: Environmental Management and Policy

Master level. Advanced level A1N

Credits: 6 ECTS

Language of instruction: English

Approved by Utbildningsnämnd C, Lund University, Faculty of Engineering, 9 April 2014

Valid from Autumn semester 2014

2. General Description of the Course

This course is a compulsory course in the first semester of the EMP (MSc in Environmental Management and Policy) programme. The course builds on the previous knowledge built during the course on Environmental Science & Sustainable Development, and provides a basis for further courses in the programme and particularly the course on Environmental Management in Organisations.

3. Learning outcomes

On completion of the course the student shall be able to

- Demonstrate familiarity with fundamental scientific and technological terms, concepts, and laws that are relevant to environmental optimisation of technical systems;
- Describe the main operating principles of technical systems in the areas of energy provision, built water systems, waste management, and separation technologies
- Demonstrate awareness on the limitations of the technical systems;

4. Course content

The course is divided into modules.

Industrialisation & technology – a historical perspective

How some of the key factors have influenced the evolution of industrial systems. Structural and operational characteristics of dominant technical systems. The interaction between technical systems, environment and the society.

Basic scientific concepts and laws

Concepts such as energy, power, entropy, energy and matter quality; Mass and heat transfer equations, basic laws of thermodynamics & diminishing returns and their implications

Energy systems and technologies

Energy products & services; Energy carriers & primary energy resources, Key elements of energy systems, their main characteristics, and interrelations; core conversion technologies,

Separation technologies

Key separation technologies commonly used for protection of the environment and human health, including their working mechanisms, operational characteristics, main application areas, advantages & disadvantages.

Built water systems

Built water systems that enable the provision of water and collection and treatment of wastewater, as well as the technologies they commonly use.

Solid waste systems and technologies

Different parts that collectively form a solid waste management system as well as key characteristics of key technologies commonly used.



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5. Teaching and assessment

The course is designed as a distance course, but can also be offered as campus course if needed. The participant communicates via the chosen learning platform, mail, chats, phone, etc. The teaching involves readings, lectures, practical exercises, forums, quizzes, and assignments. Grading is based on individual performance, via fulfillment of compulsory and a choice of elective course components.

Grading scale

The following grades are used: Fail - Pass (UG).

6. Prerequisites

Students should have been admitted to the MSc Programme in Environmental Management and Policy.

7. Literature

The final reading list is issued by the Institute no later than five weeks before the course starts.