Module Description

Integrated Sustainable Management of production systems

General Information

Number of ECTS Credits

3

Abbreviation

CM_IntSust

Version

2016.03.17

Responsible of module

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Language

	Lausanne	Bern	Zürich	Lugano/Manno
Instruction	☐ E ☐ F	☐ D ☐ E ☐ F	☐ D ☐ E	☒ E
Documentation	☐ E ☐ F	☐ D ☐ E ☐ F	☐ D ☐ E	☒ E
Examination	☐ E ☐ F	☐ D ☐ E ☐ F	☐ D ☐ E	☒ E

Module category

☐ Fundamental theoretical principles
☐ Technical/scientific specialization module
☒ Context module

Lessons

☒ 2 lecture periods and 1 tutorial period per week
☐ 2 lecture periods per week

Brief course description of module objectives and content

Companies are increasingly interested in conducting their activities so that a long-term future is assured for its business, society and environment. The purpose of this class is to deal with the well-recognized but sometimes vague concept of sustainability from an engineering perspective. The module is meant to introduce students to the implementation of sustainable management in industries and provide them with tools enabling the enhancement of the sustainability performances of production systems.

Aims, content, methods

Learning objectives and acquired competencies

During lectures, practitioners gain knowledge on the sustainability concept and are educated on its concrete application into the present industrial context. Standards, regulations, sustainability assessment tools and reporting systems are presented as the main instruments to answer market and regulations sustainability requirements raised in the last decades. The approach used to treat the sustainable management of manufacturing systems is a holistic one since all the three sustainability dimensions are addressed (i.e. environment, economy and society) and the industrial activities considered include the design and the management of product, process and supply chain in an integrated way. The course is divided into three main blocks aiming at:

1. Defining what is meant by sustainability and present the role of standards and regulations into sustainable management systems;
2. Providing students with tools allowing to assess and report on sustainability performances of products and processes. The measure of sustainability level enable to monitor the management system effectiveness and to enhance performances;
3. Presenting participants some applications dealing with the implementations of sustainable management of production systems. These actions are meant to guarantee to companies both internal benefits and competitive advantages.

Contents of module with emphasis on teaching content

Sustainability management systems into the industrial context	Course ID -01

- Introduction to sustainability: the concept and its history;
- The implementation of Environmental, Health and Safety and Energy Management systems;
- Corporate Social Responsibility;
- A non exhaustive survey of national and European environmental regulations (e.g. WEEE, RoHS, EuP, ORSAE, waste, wasted water, REACH...) to understand, interpret, and react to future developments in this field.

Sustainability Assessment and Reporting	Course ID -02

- Assessing the environmental performances: the Life Cycle Assessment (LCA);
- Assessing the cost of the product in a lifecycle perspective: the Life Cycle Costing;
- Assessing the social performances: Social LCA (S-LCA);
- Global Reporting Index (GRI).

Sustainability management implementation: some applications	Course ID -03

- Environmental labeling of products;
- Quantification and reporting of greenhouse gas emissions of organizations;
- Carbon footprint of products;
- Energy efficiency in industry.

Teaching and learning methods

Frontal theoretical lessons, case studies and exercises supported by the use of software.

Prerequisites, previous knowledge, entrance competencies

n/a

Literature

ISO 14001
OHSAS 18000
ISO 50001
ISO 26000
ISO 14020 series
ISO 14064
ISO 14067

Assessment

Certification requirements for final examinations (conditions for attestation)

Written module examination

Duration of exam:	120 minutes
Permissible aids:	none