UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

Laboratory of Past, Present and Future of Certifying Sustainability

2526-1-F7603Q026

Aims

This laboratory course will furnish an understanding of the concepts behind parametrizing sustainability, starting from more historical approaches to modern norms. To this aim, the two modules will look at the various aspects starting from a concrete example to finish in complex certification schemes.

The module on 'Food Production As Example for Sustainability Throughout The Centuries' aims to provide students with a broad overview of the different meanings of the term sustainability through the historical perspective of the development of food production.
By considering a wide range of major sourcing strategies and their progress over time (from hunting, gathering, fishing, farming and ranching to the Blue Revolution), we will assess the impact of agriculture on the environment and how different ecosystems have been adapted and shaped by human needs. Students will be able to assess the environmental impact according to different modes of supply.

The module 'Current Certification Mechanisms and Guidelines' aims at providing the students with theoretical knowledge and practical skills in Environmental and sustainability labelling, including those based on Life Cycle Assessment (LCA) standards. The laboratory will focus on the approaches developed over time for measuring, managing, and communicating the environmental impacts of products and services. The course combines foundational concepts with hands-on experience. Students will learn to conduct LCA studies, interpret results, and understand how environmental and sustainability performance can be effectively communicated through labelling schemes. Environmental and social dimensions will be primarily addressed, and global standards presented, such as the global standards for sustainability impacts, which enable any organization – large or small, private or public – to understand and report on impacts on the economy, environment and people in a comparable and credible way. Certifications schemes will entail those for investors, policymakers, capital markets, and consumers.

Knowledge and understanding
At the end of the course the student will have a fundamental understanding of:
• the impact of agriculture on the environment;
• adaption of ecosystems;
• assessing the environmental impact according to different modes of supply;

• the input data needed for certification of sustainability;
• sustainability certification schemes;
• difficulties in certifying.

Applying knowledge and understanding
At the end of the course the student will be able to:
• apply concepts and norms for certifying sustainability;
• adapt certification schemes to changing circumstances.
• develop ideas for novel certification schemes.

Making judgements
At the end of the course the student will be able to:
• apply the acquired knowledge in various contexts;
• transfer the concepts and approaches introduced in a certain context to connected fields;
• elaborate the concepts of sustainable and green processing discussed in the course.

Communication skills
At the end of the course the student should be able to
• analyse problems in the areas covered by the course in a clear and concise way.
• explain orally with a suitable language the objectives, the procedures and the results of the elaborations carried out.

Learning skills
At the end of the course the student should be able to different from those presented during the course, and to understand the topics covered in the scientific literature concerning the sustainability issue.

Contents

• Food as a fuel: history of energy in the long-run.
• Food and demographical pressure.
• New insights on sustainability: Preserving the planet managing Food Security.
• Sustainability reporting and its evolution over time.
• Life cycle thinking and its application to environmental management.
• Life cycle assessment framework according to ISO 14040/14044 standards.
• The landscape of environmental labelling programs, their criteria, and verification processes.

Detailed program

• Food as a fuel: history of energy in the long-run.
• Grain crops: social, economic and environmental impact.
• Food and demographical pressure: a comparison between China and continental Europe from Early Modern Age to nowadays.
• Food between humans and other species in the long-run: sustainable for whom? waste for whom?
• Organic farming, conventional farming, futurable farming: certifying environment, society and market.
• New insights on sustainability: Preserving the planet managing Food Security.
• Sustainability reporting frameworks.
• Historical development of life cycle approaches.
• Environmental impacts across product life cycles.
• The role of life cycle assessment in sustainable development.

• Introduction to life cycle assessment: Goal and scope in relation to intended application, Setting system boundaries, Functional unit definition, Allocation procedures, Data quality requirements, impact categories and characterization models, Midpoint vs. endpoint approaches.
• Life cycle assessment critical review requirements and procedures.
• Social LCA and Life Cycle Sustainability Assessment.
• Streamlined LCA approaches.
• Product Environmental Footprint (PEF).
• Organizational LCA.
• Introduction to Environmental Labelling: Types of environmental labels (ISO 14020 series), Evolution of environmental claims.
• Environmental Labels Type I : Ecolabel criteria development processes, Key international ecolabelling programs (EU Ecolabel, Nordic Swan, Blue Angel), Sector-specific certification schemes, Application procedures and verification.
• Self-declared environmental claims (Type II) Carbon footprint labels, Single-issue environmental labels, claims on other dimensions.
• Environmental Product Declarations Type III: EPD program requirements, Product Category Rules (PCR), Verification procedures, Communication strategies for EPDs.
• Digital tools for environmental communication.

Prerequisites

• Basic understanding of environmental science.
• Basic understanding of sustainability concepts.

Teaching form

6 CFUs of mixed theoretical and interactive lessons in the classroom (60 hours):
• 18 two-hour lectures, in person, Delivered Didactics;
• 12 two-hour lectures, in person, with interviews, exercises and debates, Interactive Didactics.

Attendance to lectures and interactive exercises is highly recommended.

Textbook and teaching resource

• Hauschild, M. Z., Rosenbaum, R. K., & Olsen, S. I. (2018). Life cycle assessment Springer International Publishing, Cham. https://doi.org/10.1007/978-3-319-56475-3.
• Directive (EU) 2024/825 of the European Parliament and of the Council of 28 February 2024 amending Directives 2005/29/EC and 2011/83/EU as regards empowering consumers for the green transition through better protection against unfair practices and through better information.
• Slides
• Notes shown during lectures and additional material on selected topics, *i.e.*, scientific articles, made available on the e-learning website of the course.

Semester

II semester (March - June)

Assessment method

The exam of the laboratory course consists in various presentations/active partecièpations during the course and a concluding presentation of a case study as starting point of an oral exam. This final oral exam comprises also the discussion of various topics covered in the two modules, with an emphasis also on the connections between concepts and tools, such as to arrive at a critical evaluation of the laboratory course topics as a whole.

Students are invited to consult the syllabi of the modules for additional information.

The final score will be the average of the scores obtained for two modules, and will be between 18/30 and 30/30 *cum laude*, based on the overall assessment considering the following criteria:
(1) knowledge and understanding;
(2) ability to connect different concepts;
(3) autonomy of analysis and judgment;
(4) ability to correctly use scientific language.

Office hours

Students are asked to refer to the indications provided in the syllabi of the modules.

Sustainable Development Goals

ZERO HUNGER | QUALITY EDUCATION | INDUSTRY, INNOVATION AND INFRASTRUCTURE | RESPONSIBLE CONSUMPTION AND PRODUCTION