Freie Universität Bozen
Libera Università di Bolzano
Università Liedia de Bulsan

Syllabus
Course description

Course title	Economics and Management of Energy Systems
Course code	45520
Scientific sector	ING-IND/35 "Business and Management Engineering"
Degree	Master Energy Engineering
Semester	2
Year	*OPT*
Academic year	2023/2024
Credits	6
Modular	No

Total lecturing hours	28 + 8
Total lab and exercise hours	18 + 6
Attendance	Not mandatory
Recommended preliminary knowledge	-
Connections with other courses	The course offers approaches and tools to evaluate and manage all the possible investments regarding Energy Systems. Under this perspective, the course is strongly related to most of the LM-30 courses.
Course page	Course Offering / Free University of Bozen-Bolzano (unibz.it)

Specific educational objectives	The course is aimed at presenting some methods and tools for the Management of Energy Systems. The theoretical concepts are referred to the energy sector also through some case studies and applied projects. The first part of the course focuses on quality management tools. The second part focuses on business planning and investment analysis. The third part outlines the basic elements of project management.

Lecturers	Prof. Sartor Marco Dr. Molinaro Margherita
Scientific sector of the lecturers	ING-IND/35
Teaching language	English
Office hours	Indicated in the timetable
Teaching assistant *(if any)*	
Office hours	-
List of topics covered	**Part 1 - QUALITY MANAGEMENT TOOLS** • Risk management • New product development • Customer satisfaction analyses **Case study applications** • Risk management in the energy industry.

	Part 2 - INVESTMENTS ANALYSIS AND BUSINESS PLANNING • Investment analysis. Criteria for evaluating investments under certainty conditions. Methods comparison. • Other calculations of cost-effectiveness. Break-even analysis. The choices of make or buy. • Business planning **Case study applications** • Evaluation of investments in the energy sector. • Business plan development **Part 3** **PROJECT MANAGEMENT** • Introduction to project management principles. • Time control and management. • Costs control and management. **Case study applications** • Time management in the energy industry.
Professional applications of the covered topics	Every industrial sector is interested in these competences.
Teaching format	The teaching format is based on frontal lectures and applied projects. In addition to a solid theoretical background a special attention will be devoted to specific exercises and case studies discussion. Several case studies and practical examples will allow the students a better understanding and application of the acquired theoretical knowledge in practice.

Learning outcomes	**(1) Knowledge and Understanding** • Basic understanding of management and business administration • To know the main methods of investment analysis • To know some quality management tools useful in the energy sector **(2) Applying knowledge and understanding** • Analysis and solution methods • Ability to formulate the analysis of profitability of an investment, choosing the appropriate method • Ability to formulate the analysis of economic convenience **(3) Making judgements** • Systems Thinking - overview of the business organization • Ability to transfer the knowledge and methods learned to real practical applications **(4) Communication skills** • Ability to structure and prepare scientific and technical documentation describing project activities with language specific to the scientific area

	(5) Ability to learn • Ability to autonomously extend the knowledge acquired during the study course by reading and understanding

Assessment

The students will be evaluated on some applied projects that they will develop. The projects will concern risk management applied to energy systems, new product development applied to energy systems, balance sheets analysis, business planning applied to energy systems, time management applied to energy systems. The projects will be developed by a group composed by (up to) 3 students. Every student will present part of each project.
The students will be evaluated also on all the theoretical contents of the course through an oral exam at the end of the course.

Formative assessment

Form	Length /duration	ILOs assessed
Projects development	During the course	(2), (3), (5)

Summative assessment

Form	%	Length /duration	ILOs assessed
Oral examination, including presentation and discussion of the assigned projects	100	About 1 hour	All except (5).

Assessment language	English
Evaluation criteria and criteria for awarding marks	The assessment is given by the evaluation of the clarity of answers, mastery of language (also with respect to teaching language), ability to summarize and establish relationships between topics, ability to apply theory to concrete cases/project works.

Required readings	Lecture slides and notes.
Supplementary readings	Quality Management: Tools, Methods and Standards, by Sartor and Orzes (Emerald, 2020) Industrial Project Management, by Tonchia (Springher, 2018)