UNIVERSITÀ DI PAVIA

Anno Accademico 2019/2020

PLANNING OF ENERGY CONVERSION SYSTEMS

Enrollment year	2019/2020
Academic year	2019/2020
Regulations	DM270
Academic discipline	ING-IND/32 (POWER ELECTRONIC CONVERTERS, ELECTRICAL MACHINES AND DRIVES)
Department	DEPARTMENT OF CIVIL ENGINEERING AND ARCHITECTURE
Course	ENVIRONMENTAL ENGINEERING
Curriculum	Energie rinnovabili
Year of study	1°
Period	2nd semester (02/03/2020 - 12/06/2020)
ECTS	6
Lesson hours	45 lesson hours
Language	English
Activity type	ORAL TEST
Teacher	ANGLANI NORMA (titolare) - 6 ECTS
Prerequisites	Preliminary knowledge of the following courses is highly recommended: technical physics, mathematical modeling, economics, energy conversion systems, energy management. Additionally, thermal machines.
Learning outcomes	The course aims at preparing the student to deal with the energy planning of an area either it is an industrial site, or it is a territory. The energy conversion stream can flow from conventional sources (i.e. thermal, hydro), from alternative/renewable sources (wind, solar, co-generation) down to the energy service at the end user. The modelling will be used to investigate technical, economic, environmental and energy aspects. The topics cover an introduction to planning (useful information from energy balance), optimization techniques (LP, ILP, MILP, GP, MOLP) and the use of scenarios for the modelling and sensitive analysis. Introduction to Osemosys.

	At the end of the course the student shall be able to model and formulate the problem of an easy energy system and to know what kind of model Osemosys is, examples of what data needs and what output provides.
Course contents	Recalls to basic energy knowledge. The role of international agreements for energy planning. The energy national balance and the statistics on the electricity national production. Introduction to mathematical programming (LP, ILP, MILP, GP MOLP) and a few solver methods (simplex and branch&bound). Osemosys: introduction to its framework, input and output. Examples of linear constrained optimization, problems formulation and solution on Excel.
Teaching methods	Lectures (hours/year in lecture theatre): 45 Practical class (hours/year in lecture theatre): 0 Practicals / Workshops (hours/year in lecture theatre): 0
Reccomended or required readings	All the materials are posted on the KIRO course website
Assessment methods	The final exam consists of an oral session where the candidate shall demonstrate his/her knowledge on the matter and be ready to formulate an optimization problem.
Further information	=
Sustainable development goals - Agenda 2030	$lbl_legenda_sviluppo_sostenibile