UCL Université catholique de Louvain

LINMA2415

2013-2014

Quantitative Energy Economics

5.0 credits	30.0 h + 22.5 h	2q

Teacher(s) :	Papavasiliou Anthony ;
Language :	Anglais
Place of the course	Louvain-la-Neuve
Inline resources:	> http://icampus.uclouvain.be/claroline/course/index.php?cid=LINMA2415
Prerequisites :	LINMA1702 (Optimisation methods and models I)
Main themes :	-- Energy market design -- Economics of energy markets -- Operations research applications in energy markets -- Contemporary problems (renewables, demand response, capacity investment and risk management)
Aims :	In reference to the AA standard, this course contributes to the development, acquisition and evaluation of the following learning outcomes: -- AA1.1, AA1.2, AA1.3 -- AA2.2, AA2.5 More specifically, at the end of the course students will be able to: -- Understand the structure and functioning of deregulated energy markets; -- Use mathematical programming models to analyze the energy markets. Acquired learning: -- implement mathematical programming models in Mosel and/or AMPL that can be used for addressing quantitative problems that arise in energy markets -- critically analyze contemporary energy issues (e.g. renewable energy integration, demand response, capacity investment) *The contribution of this Teaching Unit to the development and command of the skills and learning outcomes of the programme(s) can be accessed at the end of this sheet, in the section entitled "Programmes/courses offering this Teaching Unit".*
Evaluation methods :	-- Written or oral exam, depending on the size of the class -- Course project and/or homework assignments (to be determined)
Teaching methods :	2 hours of magistral courses per week, and 2 hours of training sections per week. Homeworks and term projects will be evaluated by the instructor and/or the teaching assistant.
Content :	-- Introduction to energy market modeling -- Electricity markets (unit commitment, transmission constraints, system security and reserves) -- Equilibrium models -- Investment planning -- Smart grid topics (wind / solar power integration, demand response) -- Quantitative methods (KKT conditions, mixed integer linear programming (MILP) models, modeling of risk aversion, stochastic programming)

Bibliography :	-- Course notes -- Printouts from textbooks or archived journals will be provided during lectures. A few textbooks that might be helpful as supporting material: Steven S. Stoft, "Power System Economics" / Daniel S. Kirschen, Goran Strbac, "Power System Economics"
Other infos :	None
Cycle and year of study :	> Master [120] in Mathematical Engineering
Faculty or entity in charge:	MAP