UCLouvain

linma2415

2017

Quantitative Energy Economics

5 credits	30.0 h + 22.5 h	Q2

Teacher(s)	Papavasiliou Anthony ;
Language :	English
Place of the course	Louvain-la-Neuve
Main themes	• Electricity market design • Modeling of energy markets • Operations research applications in energy markets • Contemporary problems (renewable energy integration, demand response integration, capacity investment and risk management)
Aims	With reference to the AA (Acquis d'Apprentissage) reference, this course contributes to the acquisition of the following learning outcomes: • AA1.1, AA1.2, AA1.3 • AA2.2, AA2.5 At the end of the course, students will have learned to: 1 • explain the architecture of energy markets, ranging from real-time to forward markets • formulate mathematical programming models that describe energy markets and regulatory interventions in these markets • formulate mathematical programming models that describe risk management practices in the energy sector • implement mathematical programming models that describe energy markets and risk management practices using AMPL • provide economic interpretations to the results of mathematical programming models for energy markets - - - - *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 exam • Course project and homework assignments
Teaching methods	2 hours of magistral courses per week, and 2 hours of training sections per week. Homeworks will be evaluated by the instructor and/or the teaching assistant.
Content	• Mathematical background (duality) • Power system and power market operations • Competitive equilibrium models • Short-term electricity market operations (economic dispatch, optimal power flow, unit commitment, reserves) • Hedging risk through financial instruments • Long-term energy system planning
Inline resources	https://moodleucl.uclouvain.be/course/view.php?id=5003
Bibliography	• Notes de cours • Impressions de manuels ou articles fournies au cours. Quelques lectures qui pourraient être utiles en tant que support : Steven S. Stoft, "Power System Economics" / Daniel S. Kirschen, Goran Strbac, "Power System Economics"
Other infos	None
Faculty or entity in charge	MAP

Programmes containing this learning unit (UE)				
Program title	Acronym	Credits	Prerequisite	Aims
Master [120] in Mathematical Engineering	MAP2M	5		