FACULTÉ DE DROIT
UNIVERSITÉ SAVOIE MONT BLANC

Smart grids and smart cities

ECTS
2 crédits

Composante
Polytech Annecy-Chambéry

En bref

> **Langues d'enseignement:** Anglais

> **Méthodes d'enseignement:** En présence

> **Forme d'enseignement :** Cours magistral

> **Ouvert aux étudiants en échange:** Oui

Présentation

Description

* Semester 9
* Duration : Within one semester
* Type: Mandatory
* Student workload: Lecture (CM): 18 hours, 20 hours of self-study
* Applicability: ESBC course only
* Teaching and learning method : Lecture, case studies, discussion
* Module examination: 1 written exam (60%), 1 Assignment (25%), 1 individual presentation (15%)

Responsible person for the module: Rowena Mathew- Ph.D in economics, IREGE Laboratory, IAE, USMB

Research fields: Environmental economics, energy transitions, climate change mitigation, renewable energy storage, electric vehicles, household electricity, economic modelling

Thesis: Optimising usage of electric vehicles and solar PV in households for increased energy storage and welfare - 🔗 Resume

🔗 https://www.irege.univ-smb.fr/en/phd-students/

Objectifs

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DE L'ENSEIGNEMENT
SUPÉRIEUR,
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ET DE L'INNOVATION
Liberté
Égalité
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Major intended learning outcomes:

*   Upon completion of the module students will
*   Understand the need and context for smart grids and smart cities
*   Describe and understand the new energy paradigm and gain a holistic perspective of sustainable energy systems
*   Describe and understand energy transitions and the role of smart technologies to facilitate it
*   Assess the complexity of electricity systems and its transformation to a low carbon economy
*   Contextualise applicability in different countries
*   Be able to identify key actors, best cases and organizations

Heures d'enseignement

Smart grids and Smart cities - CM	Cours Magistral	18h

Pré-requis obligatoires

Admission to 2nd year

Plan du cours

Content of the module:

*   Classes 1 and 2 - Introduction to Climate Change, Climate Finance and Principles of Environmental Economics. Introduction to Smart Grids, Smart Cities and Context/Need of Energy Transition.
*   Classes 3 and 4 - Energy Transition (contd.) and Electricity Markets, Smart Citizens who are 'prosumers', Types of Smart Technology.
*   Class 5 Best Practices in Smart Cities/Smart Grids, Discussion on practical case studies.
*   Classes 6 and 7 - Submission of Homework Assignment (25%). Business models, Renewable Energy Integration and Operation, Distributed Generation.
*   Classes 8 and 9 - Individual presentations in class (15%). Various Applications of Smart Grids, Key financial factors, Industry trends, Introduction to Modelling.
*   Class 10 - Energy policy and regulations at regional, national and sub-national level.
*   Class 11 - Integrating IT, Telecom and Cyber Security.
*   Class 12 - Final written exam (60%)

Bibliographie

Suggested Readings:

*   Calearo, L., Ziras, C., Sevdari, K., & Marinelli, M. (2021). Comparison of Smart Charging and Battery Energy Storage System for a PV Prosumer with an EV. Proceedings of 2021 IEEE PES Innovative Smart Grid Technologies Europe: Smart Grids: Toward a Carbon-Free Future, ISGT Europe 2021. https://doi.org/10.1109/ISGTEurope52324.2021.9640120

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* Longo, M., Yaïci, W., & Foiadelli, F. (2017). Electric vehicles charged with residential's roof solar photovoltaic system: A case study in Ottawa. 2017 IEEE 6th International Conference on Renewable Energy Research and Applications (ICRERA), 121–125. https://www.researchgate.net/profile/Wahiba-Yaici/publication/321816071_Electric_vehicles_charged_with_residential's_roof_solar_photovoltaic_system_A_case_study_in_Ottawa/links/5a340c8745851532e82cb062/Electric-vehicles-charged-with-residentials-roof-solar-photovoltaic-system-A-case-study-in-Ottawa.pdf
* MEADOWS, Donella; RANDERS, Jorgen; MEADOWS, Dennis. Limits to Growth: the 30-year update. London: Earthscan, 2004.
* Tietenberg T. and Lewis L. : Environmental Economics and Policy, Pearson Education, 6th ed., 2010
* Kolstad C.D. : Environmental Economics, Oxford University Press, 2010
* Stern Commission Report

Reports, Websites:

* International Energy Agency (IEA) https://www.iea.org/reports/smart-grids
* United Nations Environment Program (UNEP)
* United States Environment Protection Agency (US EPA)
* European Union Commission (EC)
* United Nations Framework Convention on Climate Change (UNFCCC)
* World Economic Forum (WEF)
* World Business Council for Sustainable Development (WBCSD)
* Stern Commission Report
* Inter-Governmental Panel on Climate Change (IPCC)
* European Technology Platform for Electricity Networks of the Future
* UCES/IAE. 2021. Are we getting the best out of Smart Home Technologies? The role of usability. https://userstcp.org/wp-content/uploads/2021/10/Usability-Report-Final-Oct-2021.pdf.
* Energy Future Coalition. 2003. Smart Grid Working Group. "Challenge and Opportunity: Charting a New Energy Future, Appendix A: Working Group Reports"

Infos pratiques

Lieux

> Le Bourget-du-Lac (73)

Campus

> Le Bourget-du-Lac / campus Savoie Technolac

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