FACULTÉ DE DROIT
UNIVERSITÉ SAVOIE MONT BLANC

SCIENCES, TECHNOLOGIES, SANTÉ

Master Energie solaire (Solar energy)

Niveau de diplôme
BAC +5

ECTS
120 crédits

Durée
2 années, 4 semestres

Langues d'enseignement
Anglais

Parcours proposés

- Energy for solar buildings and cities (Energie pour bâtiments et villes solaires)
- Energie pour bâtiments et villes solaires - Formation continue
- Solar energy, law, economics and management (Droit, économie et gestion pour énergie solaire)

Présentation

GRADUATE SCHOOL SOLAR ACADEMY

The Master program **SOLAR ENERGY** is a highly innovative, new degree program preparing to tackle present and future challenges of the energy transition. It is a part of Solar Academy Graduate School recently awarded to University of Savoie Mont Blanc (USMB).

The two-year master program S3E, is composed of two tracks: ESBC (*Energy for Solar Building and Cities*), focused on engineering, and SoLEM (*Solar Energy: Law Economics and Management*) focused on economics.

This master program is jointly developed by the School of Engineering (Polytech Annecy-Chambery), School of Business and Administration (Institut d'Administration des Entreprises IAE Savoie Mont Blanc) and School of Law (Faculté de Droit) at USMB.

Located on the Bourget-du-Lac Campus, close to INES (National Institute for Solar Energy) experimental facilities, you will participate in high quality education and multidisciplinary projects, stimulating your creativity and entrepreneurial skills.

Objectifs

The *Energy for Solar Building and Cities* program combines practice and theory centered on the fields of solar energy engineering, building physics and materials science, with an opening to computer science, architecture and urban planning, law, economics and sociology.

The training provides the knowledge on how to deploy the energy transition in the building sector, with a particular focus on solar energy. It provides technical tools for system sizing and management, and develops an in-depth understanding of the energy transition, including its relationship with public policies, economic and industrial transformations, business models, legal concepts and tools specific to the renewable energy sector, in particular solar energy.

The core training in *Solar Energy: Law Economics and Management* program, based on economics, management and law, provides knowledge on how to apply the main tools of economic analysis and develop an in-depth understanding of the energy transition, including its relationship with public policies, industrial transformations, business models, legal

MINISTÈRE DE L'ENSEIGNEMENT SUPÉRIEUR, DE LA RECHERCHE ET DE L'INNOVATION
Liberté
Égalité
Fraternité

concepts and tools specific to the renewable energy sector, in particular solar energy.

Dimension internationale

Courses are taught, in English, by international experts and highly recognized partners from national and international research institutions and industry as well as by academic staff of USMB.

Disciplinary and international mobility, as well as immersion in an international research environment, are an integral part of the curriculum, bringing added value to students in terms of training and research. Grants for international mobility, awards for best projects as well as scholarships awarded for excellent academic results are available.

Les atouts de la formation

Innovative multidisciplinary education offers common introduction to economics and law, focusing on environmental economics and energy law (important challenges in the energy transition), and to engineering sciences, focusing on solar energy (highly growing sector of renewable energy) and on energy efficiency in building sector (responsible for over 40% of world primary energy consumption)

Projects and workshops complement this unique teaching experience.

M1 internship of 2 months.

Mandatory M2 internship of 6 months (February to July).

Excellence scholarships will be awarded to selected candidates, and funded by the Solar Academy Graduate School, in order to attract students with an excellent academic level and a real motivation (more information on the website).

Organisation

Effectifs attendus

24 students for ESBC track and 12 for SoLEM (in 2021)

Aménagements d'études

https://www.univ-smb.fr/en/formation/amenagements-specifiques/

Date de début de la formation : Beginning of September

Date de fin de la formation : End of June

Admission

A qui s'adresse la formation ?

The ESBC program recruits students with a bachelor degree in Engineering, Physics, Sciences and Technologies or equivalent.

The SoLEM program recruits students with a bachelor degree in Economics, Management, Law, Humanities or Social Sciences, or equivalent.

Conditions d'accès

A minimum of 180 ECTS credits is required as well as a sufficient knowledge of English language

Candidater et s'inscrire

Applications are only made online (Campus France, E-Candidate...). To know more about it

Attendus de la formation

For ESBC track, general knowledge of engineering sciences and physics of transfers is desirable.

For SoLEM track, general knowledge of economics is desirable

Et après

Poursuite d'études hors USMB

Ph.D. in Economics, Law, Management, Engineering Sciences, in particular solar energy deployment and energy efficiency, within the Solar Academy Graduate Program.

Following the master's program, it is possible to continue with a doctoral program either at USMB or at a French or foreign university.

Poursuite d'études à l'étranger

Following the master's program, it is possible to continue with a doctoral program either at USMB or at a French or foreign university.

Métiers visés et insertion professionnelle

The objective of the ESBC program is to train future researcher and senior executives, including engineers in technical design offices. Companies in the energy and building sectors, consulting firms, government regulatory services and NGOs are interested in candidates with a dual set of skills, such as those they will be able to develop in the ESBC Master's program.

The objective of the SoLEM program is to train future researchers and senior executives from public or private institutions and companies. Firms from the energy sector, consultancy offices, government regulation offices as well as NGOs are interested in candidates with a dual set of skills, such as the ones you will develop in the SoLEM Master program.

Infos pratiques

Contacts

Responsable pédagogique

Monika Woloszyn
Monika.Woloszyn@univ-smb.fr

Gestionnaire administratif

Florence Besson
+33 4 79 75 88 23
Florence.Besson1@univ-smb.fr

Laboratoires partenaires

Centre Antoine Favre
https://univ-droit.fr/structures-de-recherche/1224-centre-de-recherche-en-droit-antoine-favre-crdaf-chambery

IREGE
https://www.irege.univ-smb.fr/en/homepage/

LAMA
https://www.lama.univ-savoie.fr/index.php?&lang=en

LEPMI
https://lepmi.grenoble-inp.fr/

LISTIC
https://www.univ-smb.fr/listic/en/

CEA, Centre Antoine Favre, IREGE, LAMA, LEPMI, LISTIC, LLSETI, LOCIE
https://www.univ-smb.fr/solaracademy/research-units/

FACULTÉ DE DROIT
UNIVERSITÉ SAVOIE MONT BLANC

Campus

Le Bourget-du-Lac / campus Savoie Technolac

En savoir plus

Solar Academy Graduate School

https://www.univ-smb.fr/solaracademy/

FACULTÉ DE DROIT
UNIVERSITÉ SAVOIE MONT BLANC

Programme

Energy for solar buildings and cities (Energie pour bâtiments et villes solaires)

M1 - Energy for solar buildings and cities

Semestre 7

UE701 Core solar	4 crédits
Solar ressource, radiation and optics	3 crédits
Application to solar systems	1 crédits
UE702 Core building	4 crédits
Energy needs and performance	1 crédits
Building energy : envelope and HVAC	3 crédits
UE703 Physics and materials for solar systems and buildings	4 crédits
Thermodynamics and heat transfer	3 crédits
Materials for energy	1 crédits
UE704 Introduction to economics	4 crédits
Introduction to economics	2 crédits
Public economics	2 crédits
UE705 Sustainability for energy transition	8 crédits
International and european regulations	2 crédits
Industry and human sciences for solar energy	2 crédits
Sustainability analysis	2 crédits
Foreign language choice	
Foreign language (French)	2 crédits
Foreign language English	2 crédits
UE706 Introduction to research	6 crédits
Library research tools and methods	
Literature review project	6 crédits

Semestre 8

FACULTÉ DE DROIT
UNIVERSITÉ SAVOIE MONT BLANC

UE801 Power generation	6 crédits
Solar power generation	2 crédits
Energy vectors & Energy storage	2 crédits
Energy grids	2 crédits
UE802 Advanced tools - experimental	4 crédits
Experimental methods	2 crédits
Application to solar systems	2 crédits
UE803 Modelling of transfers phenomena	4 crédits
Computational fluid mechanics (CFD)	2 crédits
Building performance simulation (BPS)	1 crédits
Radiation modeling in complex media	1 crédits
UE804 Introduction to management	2 crédits
Strategic management	2 crédits
UE805 Energy environment and society	6 crédits
Specific energy contracts and fiscal law	2 crédits
International energy policies, market and research	2 crédits
Foreign language choice	
Foreign language (French)	2 crédits
Foreign language English	2 crédits
UE806 Innovation, creativity and research	8 crédits
Creativity through biomimicry for solar cities	2 crédits
Research project	6 crédits
Optional Internship/Work placement	

M2 - Energy for solar buildings and cities

Semestre 9

UE901 Advanced solar systems	6 crédits
Solar thermal systems	2 crédits
Building integrated PV (BIPV-BIPVT)	2 crédits
Solar power generation	2 crédits
UE902 Tools for solar cities	6 crédits
Urban metabolism: energies, anergy, geothermy…	2 crédits
Solar cadastre, solar performance	2 crédits
Environmental regulation for buildings and systems	2 crédits
UE903 Advanced methods	4 crédits
Artificial intelligence	2 crédits
Operational research for urban solar development	2 crédits
UE904 Urban development	6 crédits
Case study common project	2 crédits
Performance indicators and information processing	1 crédits
Urban planning and architectural integration	1 crédits
Foreign language choice	
Foreign language (French)	2 crédits
Foreign language English	2 crédits
UE905 Research and innovation project	8 crédits
Multidisciplinary project	6 crédits
Entrepreneurship, innovation challenge	2 crédits

Semestre 10

UE001 Internship	30 crédits
Internship	30 crédits

Energie pour bâtiments et villes solaires - Formation continue

FACULTÉ DE DROIT
UNIVERSITÉ SAVOIE MONT BLANC

M2 - Energie pour bâtiments et villes solaires - Formation continue

Semestre 9

Semestre 10

Solar energy, law, economics and management (Droit, économie et gestion pour énergie solaire)

M1 - Solar energy, law, economics and management

Semestre 7

UE701 Core Law	4 crédits
Legal issues related to renewlable energies	2 crédits
Bases of contract law	2 crédits
UE702 Core Economics	4 crédits
Environmental economics and Externalities	2 crédits
Economics of energy and climate policies	2 crédits
UE703 Quantitative analysis	4 crédits
Advanced data analysis	2 crédits
Introduction to econometrics	2 crédits
UE704 Introduction to Solar Energy	4 crédits
Solar Thermal and Photovoltaïc	2 crédits
Projet	2 crédits
UE705 Sustainability for energy transition	8 crédits
International and european regulations	2 crédits
Industry and human sciences for solar energy	2 crédits
Sustainability analysis	2 crédits
Foreign language choice	
Foreign language (French)	2 crédits
Foreign language English	2 crédits
UE706 Introduction to research	6 crédits
Library research tools and methods	
Literature review project	6 crédits

Semestre 8

UE801 Market and Energy Prices	2 crédits
Price dynamic modelling	1 crédits
International energy markets	1 crédits
UE802 Adoption of renewables	4 crédits
NPV Computation	1 crédits
Intertemporal optimization under uncertainty	1 crédits
Adoption of environmental innovations	2 crédits
UE803 Urban planning and city	2 crédits
Urban Planning	1 crédits
Urban Law	1 crédits
UE804 Energy transition and public policies	4 crédits
Public policies assessment in econometrics	1 crédits
Modelisation and economic prospective	1 crédits
Health Law	1 crédits
Energy and territorial development	1 crédits
UE805 Introduction to Energy use in Buildings and Cities	4 crédits
Energy use in Buidlings	3 crédits
Sustainable Urban Energy	1 crédits
UE806 Energy Environment and Society	6 crédits
Specific energy contracts and fiscal law	2 crédits
International energy policies, market and research	2 crédits
Foreign language choice	
Foreign language (French)	2 crédits
Foreign language English	2 crédits
UE 807 Innovation, creativity and research	8 crédits
Creativity through biomimicry for solar cities	2 crédits
Research project	6 crédits
Optional Internship/Work placement	

M2 - Solar energy, law, economics and management

Semestre 9

UE901 Advanced Business Models	4 crédits
Legal regim : production, use solar electricity	2 crédits
New Business models in energy industry	2 crédits
UE902 Energy Efficiency	4 crédits
Energy efficiency in buildings	2 crédits
Empirical case studies in energy efficiencies	2 crédits
UE903 Energy transition and development	4 crédits
Long run optimization (dynamic control)	2 crédits
100% renewable objective	1 crédits
Renewables in developing countries	1 crédits
UE904 Smart grids and smart city	4 crédits
Modeling in the literature	2 crédits
Smart grids and smart cities	2 crédits
UE 905 Urban development	6 crédits
Case study common project	2 crédits
Urban planning and architectural integration	1 crédits
Performance indicators and information processing	1 crédits
Foreign language choice	
Foreign language (French)	2 crédits
Foreign language English	2 crédits
UE906 Research and innovation project	8 crédits
Multidisciplinary project	6 crédits
Entrepreneurship, innovation challenge	2 crédits

Semestre 10

UE001 Internship	30 crédits
Internship	30 crédits