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

Mots-clés
Energy, Solar Energy, Thermal Energy, Energy Performance Building and City, Heating, Air Conditioning, Thermal Plant Operation, bPower Generation, Energy Economics and Law, Management and Administration, Energy and Environmental Transition, Solar Energy

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.

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

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 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'admission

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

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

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Florence.Besson1@univ-savoie.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/

Autres structures partenaires

International partners of Solar Academy

Campus

Le Bourget-du-Lac / campus Savoie Technolac

En savoir plus

Solar Academy Graduate School
https://www.univ-smb.fr/solaracademy/

Programme

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

M1 - Energy for solar buildings and cities

Semestre 7

	Nature	CM	TD	TP	Crédits
UE701 Core solar	UE				4 crédits
Solar ressource, radiation and optics	EC	9h	12h	6h	3 crédits
Application to solar systems	EC	4,5h	6h	3h	1 crédits
UE702 Core building	UE				4 crédits
Energy needs and performance	EC	4,5h	6h		1 crédits
Building energy : envelope and HVAC	EC	6h	19,5h	3h	3 crédits
UE703 Physics and materials for solar systems and buildings	UE				4 crédits
Thermodynamics and heat transfer	EC		30h		3 crédits
Materials for energy	EC	6h	6h		1 crédits
UE704 Introduction to economics	UE				4 crédits
Introduction to economics	EC	9h	9h		2 crédits
Public economics	EC	9h	9h		2 crédits
UE705 Sustainability for energy transition	UE				8 crédits
International regulations	EC	9h	4,5h		2 crédits
SEMINARS solar 1	EC	15h			2 crédits
Sustainability analysis	EC	9h	6h	9h	2 crédits
Foreign language choice	CHOIX				
Foreign language (French)	EC		30h		2 crédits
Foreign language English	EC		30h		2 crédits
Foreign language Other	EC		30h		2 crédits
UE706 Introduction to research	UE				6 crédits
Library research tools and methods	MODULE		4h		
Literature review project	EC	6h		24h	6 crédits

Semestre 8

	Nature	CM	TD	TP	Crédits
UE801 Power generation	UE				6 crédits
Solar power generation	EC		13,5h		2 crédits
Energy vectors & Energy storage	EC	6h	12h	3h	2 crédits
Energy grids	EC		3h	18h	2 crédits

UE802 Advanced tools - experimental	UE				4 crédits
Experimental methods	EC		6h	12h	2 crédits
Application to solar systems	EC			20h	2 crédits
UE803 Modelling of transfers phenomena	UE				4 crédits
Modelling of Energy Systems	EC			16h	2 crédits
Building performance simulation (BPS)	EC			12h	1 crédits
Radiation modeling in complex media	EC		2h	12h	1 crédits
UE804 Introduction to management	UE				2 crédits
Strategic management	EC	9h	9h		2 crédits
UE805 Energy environment and society	UE				6 crédits
European regulations	EC	9h	4,5h		2 crédits
SEMINARS Solar 2	EC	18h			2 crédits
Foreign language choice	CHOIX				
Foreign language (French)	EC				2 crédits
Foreign language English	EC				2 crédits
Foreign language Other	EC				2 crédits
UE806 Innovation, creativity and research	UE		22h		8 crédits
Creativity through biomimicry for solar cities	EC		22h		2 crédits
Research project	EC			24h	6 crédits
Optional Internship/Work placement	MODULE				

M2 - Energy for solar buildings and cities

Semestre 9

	Nature	CM	TD	TP	Crédits
UE901 Advanced solar systems	UE				6 crédits
Solar thermal systems	EC		12h	9h	2 crédits
Building integrated PV (BIPV-BIPVT)	EC		9h	6h	2 crédits
Solar power generation	EC		15h	9h	2 crédits
UE902 Tools for solar cities	UE				6 crédits
Urban metabolism: energies, anergy, geothermy…	EC	3h	9h		2 crédits
Solar cadastre, solar performance	EC	6h	12h	4h	2 crédits
Environment and buildings and systems	EC	6h	12h		2 crédits
UE903 Advanced methods	UE				4 crédits
Artificial intelligence	EC	6h	1,5h	6h	2 crédits
Operational research for urban solar development	EC	3h	3h	18h	2 crédits
UE904 Urban development	UE				6 crédits
Case study common project	EC	9h	10,5h	16h	2 crédits
Performance indicators and information processing	EC	6h	12h		1 crédits
Urban planning and architectural integration	EC	10h		3h	1 crédits
Foreign language choice	CHOIX				

Foreign language (French)	EC		30h		2 crédits
Foreign language English	EC		30h		2 crédits
Foreign language other	EC		30h		2 crédits
UE905 Research and innovation project	UE				8 crédits
Research project	EC	6h		20h	6 crédits
Entrepreneurship, innovation challenge	EC	6h		4h	2 crédits

Semestre 10

	Nature	CM	TD	TP	Crédits
UE001 Internship	UE				30 crédits
Internship	EC				30 crédits

Energie pour bâtiments et villes solaires - Formation continue

M2 - Energie pour bâtiments et villes solaires - Formation continue

Semestre 9

	Nature	CM	TD	TP	Crédits
UE901 Performance Energétique des Bâtiments	UE				6 crédits
Physique du bâtiment	EC	14,5h		14h	3 crédits
Intégration des systèmes énergétiques	EC	10,5h	21h		3 crédits
UE902 Outils de la Transition Energétique & Environnementale	UE				6 crédits
Conception Environnementale des Bâtiments	EC	14h	17,5h		3 crédits
Réglementation Environnementale des Bâtiments	EC		28,5h		3 crédits
UE903 Solaire Thermique	UE				6 crédits
Solaire Thermique sur Réseaux énergétiques urbains	EC	10,5h		4h	1,5 crédits
Systèmes solaires thermiques dans le bâtiment	EC	28h	17,5h		4,5 crédits
UE904 Solaire Photovoltaïque	UE				6 crédits
Solaire PV raccordé au réseau	EC	35h		4h	4 crédits
Conception et ingénierie de projets photovoltaïques	EC	4h	17h		2 crédits
UE905 Management de projets en énergie solaire et efficacité énergétique	UE				6 crédits
Collectivités et Transition Environnementale	EC	3,5h	14h		2 crédits
Analyse économique de projets Energies Renouvelables	EC		20,5h		2 crédits
Droit public et privé & Projets solaires	EC	22h			2 crédits

Semestre 10

	Nature	CM	TD	TP	Crédits
UE001 Stage	UE				30 crédits

Stage d'insertion professionnelle	EC	30 crédits

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

M1 - Solar energy, law, economics and management

Semestre 7

	Nature	CM	TD	TP	Crédits
UE701 Core Law	UE				4 crédits
Bases of business law	EC	10,5h			2 crédits
Bases of contract law	EC	10,5h			2 crédits
UE702 Core Economics	UE				4 crédits
Environmental economics and Externalities	EC	21h			2 crédits
Economics of energy and climate policies	EC	21h			2 crédits
UE703 Quantitative analysis	UE				4 crédits
Advanced data analysis	EC	15h	15h		2 crédits
Introduction to econometrics	EC	19,5h	10,5h		2 crédits
UE704 Introduction to Solar Energy	UE				4 crédits
Solar Thermal and Photovoltaïc	EC	12h	4,5h		2 crédits
Projet	EC			4h	2 crédits
UE705 Sustainability for energy transition	UE				8 crédits
International regulations	EC	9h	4,5h		2 crédits
SEMINARS solar 1	EC	15h			2 crédits
Sustainability analysis	EC	9h	6h	9h	2 crédits
Foreign language choice	CHOIX				
Foreign language (French)	EC		30h		2 crédits
Foreign language English	EC		30h		2 crédits
Foreign language Other	EC		30h		2 crédits
UE706 Introduction to research	UE				6 crédits
Library research tools and methods	MODULE		4h		
Literature review project	EC	6h		24h	6 crédits

Semestre 8

	Nature	CM	TD	TP	Crédits
UE801 Market and Energy Prices	UE				4 crédits
Price dynamic modelling	EC	12h	9h		2 crédits
International energy markets	EC	21h			2 crédits

UE802 Adoption of renewables	UE				3 crédits
Basics of finance fo project management	EC	21h			2 crédits
Adoption of environmental innovations	EC	10,5h			1 crédits
UE803 Urban planning and city	UE				2 crédits
Innovation in energy sector	EC	15h			1 crédits
Urban Law, urban planning and territorial development	EC	18h			1 crédits
UE804 Energy transition and public policies	UE				3 crédits
Public policies assessment in econometrics	EC	10,5h			2 crédits
Fiscal law and solar energy	EC	9h			1 crédits
UE805 Introduction to Energy use in Buildings and Cities	UE				4 crédits
Energy use in Buidlings	EC	6h	15h		3 crédits
Sustainable Urban Energy	EC			4h	1 crédits
UE806 Energy Environment and Society	UE				6 crédits
European regulations	EC	9h	4,5h		2 crédits
SEMINARS Solar 2	EC	18h			2 crédits
Foreign language choice	CHOIX				
Foreign language (French)	EC				2 crédits
Foreign language English	EC				2 crédits
Foreign language Other	EC				2 crédits
UE 807 Innovation, creativity and research	UE				8 crédits
Creativity through biomimicry for solar cities	EC		22h		2 crédits
Research project	EC			24h	6 crédits
Optional Internship/Work placement	MODULE				

M2 - Solar energy, law, economics and management

Semestre 9

	Nature	CM	TD	TP	Crédits
UE901 Advanced Business Models	UE				4 crédits
Legal regim for production and use for solar electricity	EC	18h			2 crédits
New Business models in energy industry	EC	18h			2 crédits
UE902 Energy Efficiency and development	UE				4 crédits
Energy efficiency in buildings	EC	18h			2 crédits
Empirical case studies in energy efficiencies	EC		12h		2 crédits
UE903 Energy transition and development	UE				4 crédits
Longitudinal data models	EC	9h	9h		2 crédits
Energy and sustainable development law	EC	9h			2 crédits
UE904 Smart grids and smart city	UE				4 crédits
Optimization of energy system	EC	9h	9h		2 crédits
Smart grids and smart cities	EC	18h			2 crédits

UE905 Urban development	UE				6 crédits
Case study common project	EC	9h	10,5h	16h	2 crédits
Urban planning and architectural integration	EC	10h		3h	1 crédits
Performance indicators and information processing	EC	6h	12h		1 crédits
Foreign language choice	CHOIX				
Foreign language (French)	EC		30h		2 crédits
Foreign language English	EC		30h		2 crédits
Foreign language other	EC		30h		2 crédits
UE906 Research and innovation project	UE				8 crédits
Research project	EC	6h		20h	6 crédits
Entrepreneurship, innovation challenge	EC	6h		4h	2 crédits

Semestre 10

	Nature	CM	TD	TP	Crédits
UE001 Internship	UE				30 crédits
Internship	EC				30 crédits