

SCIENCES, TECHNOLOGIES, SANTÉ

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

Master Energie solaire (Solar energy)



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,
Power
Generation

Présentation



The Master program ESBC: Energy for Solar Buildings and Cities, 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 Master program ESBC is a two-year full-time Master's degree, composed of 4 semesters representing a total of 120

ECTS (officially integrated in the European Bologna system of higher education).

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 of INES (National Institute for Solar Energy), you will participate in high quality education and multidisciplinary projects, stimulating your creativity and entrepreneurial skills.

Objectifs

The training 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.

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 introduction 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) will give a unique multidisciplinary education.

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.

Organisation

Effectifs attendus

24 students for SoLEM (in 2021)

Aménagements d'études

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

Date de début de la formation : September

Date de fin de la formation : June

Admission

A qui s'adresse la formation ?

General knowledge of engineering sciences and physics of transfers is desirable.

Conditions d'admission

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

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.

Métiers visés et insertion professionnelle

Real estate activities|Construction|Modelling and construction|Generation and distribution of electricity, gas, steam and air-conditioning | Specialized, scientific and technical activities | Specialized scientific and technical activities.

Building control and technical diagnostics|Engineering and civil engineering studies|Engineers and managers in building and public works|Building control and technical diagnostics|Engineering and civil engineering studies|Engineers and managers in energy production and distribution, water|Consulting engineers in technical studies|Management and engineering studies, research and industrial development|Researchers in public research|Engineers and technical-commercial managers in building, public works|Higher education teachers

Infos pratiques

Contacts

Gestionnaire administratif

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Campus

🏠 Le Bourget-du-Lac / campus Savoie Technolac

En savoir plus

Solar Academy Graduate School

🔗 <https://www.univ-smb.fr/solaracademy/>

Programme

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 |

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|--|--------|-----|------|-----|-----------|
| 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 |

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|--|----|----|-----|--|-----------|
| 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 |