

CONTENT OF THE COURSES

Master Energy for solar buildings and cities (ESBC)

YEAR 1 - SEMESTER 7	
COURSE	Ects
UE701 Core Solar	4
Solar Ressource, Radiation and Optics	3
Application to solar systems	1
UE702 Core Building	4
Energy needs and performance in the built environment	1
Building energy performance : Envelope, Loads and HVAC systems	3
UE703 Physics and materials for solar systems and buildings	4
Thermodynamics and heat transfer	3
Materials for energy	1
UE704 Introduction to Economics	4
Introduction to economics	2
Public economics	2
UE705 Sustainability for energy transition	8
Legal issues related to renewable energies	2
Human sciences for solar energy: Social, historical and industrial perspective	2
Sustainability analysis: principles, tools and metrics	2
Foreign language (French) - FLE Mandatory for foreign students	2
Foreign language English	2
UE706 Introduction to research	6
Library research tools and methods, publishing process in science	
Literature review project	6
	30

YEAR 1 - SEMESTER 8	
COURSE	Ects
UE801 Power generation	6
Solar power generation (PV, CSP, solar thermal energy)	2
Energy vectors & Energy storage	2
Energy grids	2
UE802 Advanced tools - experimental	4
Experimental methods, measurements and data collection	2
Application to solar systems	2
UE803 Modelling of transfers phenomena	4
Computational fluid mechanics (CFD)	2
Building performance simulation (BPS)	1
Radiation modeling in complex media	1
UE804 Introduction to management	2
Strategic management	2
UE805 Energy Environment and Society	6
Specific energy contracts and Fiscal law	2
International energy policies and markets	2
Foreign language (French) - FLE Mandatory for foreign students	2
Foreign language English	2
UE 806 Innovation, creativity and research	8
Creativity through biomimicry for solar cities	2
Research project	6
Optional Internship/Work placement	
	30

YEAR 2 - SEMESTER 9	ECTS
COURSE	
UE901 Advanced Solar Systems	6
Solar thermal systems (design, modeling and operation)	2
Building integrated PV (BIPV-BIPVT) - design and predictive tools	2
Solar power generation	2
UE902 Tools for Solar Cities	6
Urban Metabolism: Energies, anergy, geothermy...	2
Solar cadastre, solar performance	2
Environmental regulation for buildings and solar collectors (standards, tests and warranties)	2
UE903 Advanced methods (Lamia)	4
Artificial Intelligence	2
Operational research for urban solar development	2
UE 904 Urban development	6
Case study common project : CIM (BIM), Monitor, Energy forecast, Data analysis	2
Urban planning and architectural integration	1
Performance indicators and information processing	1
Foreign language (French) - FLE Mandatory for foreign students	2
Foreign language English	2
UE905 Research and Innovation Project	8
Multidisciplinary project	6
Entrepreneurship, Innovation challenge	2
	30

YEAR 2 - SEMESTER 10	ECTS
COURSE	
Internship	30