

BUILDING ENERGY DESIGN

- Dynamic models of energy and environmental behaviour of buildings (TRNSYS LITE, ENERGY+). Application of experimental energy evaluation - monitoring methodology.
- Calculation of the buildings energy consumption under dynamic conditions. Use of computational methods.
- Indoor energy and environmental design. Optimization methods for the thermal environmental and visual performance.
- Energy monitoring. Evaluation theory techniques. General energy balances.
- Energy classification of buildings. Energy harmonisation methods and energy classification.
- Comparison of theoretical and experimental techniques and energy evaluation procedures.
- Wind power potential, optimum site selection, topography and turbulence issues.
- Wind energy converters, types of generators, power production curves, Betz limit.
- Wave characteristics, wave power potential, power production matrices (wave height, wave period).
- Wave generators - basic principles of operation (attenuation, oscillation, submerged, surface rotation of mass etc).
- Combined energy production (wind-wave), prototypes – cons and pros of each one.
- Power network management and relationship with meteorological conditions (load balancing and load forecasting).
- Solar systems for energy production – photovoltaics, concentrated solar power (CSP).