

Specialized courses offered by Department of Environmental Engineering

Dr Hab. Eng. Marderos Ara Sayegh, Prof. PWr.

Carbon neutral design of building:

This course provides a background on carbon mitigation challenges, policies, measures, methods, tools and energy demand side management. It presents an emerging definition that relates to measuring, reducing and offsetting the energy used by the buildings to achieve low and zero-carbon based buildings. The course includes designing a high performance building envelope, integrating passive and mechanical technologies for building with installing on-site renewable energy applications. These targets may be accomplished and achieved by implementing innovative sustainable design strategies to assess the carbon impact in buildings .

International certification systems in buildings:

This course provides energy performance of buildings, energy audit, environmental science in buildings and their operation systems and installed equipment, which ensure the comfort, productivity and safety of the occupants. Simultaneously this course focuses on the rating approaches for assessing the environmental impact of building and the technical instruments, criteria, tools, scoring systems and categories for methodology of environmental evaluation. Includes comprehensive scope of European directives of building performance, legalisations. It focuses on the basics, what does assess, the rating and requirements in practice, differences and developments, and mainly the sustainability criteria for each methodologies of LEED, BREEAM, DGNB, GREEN STAR, MILJOBYGGNAD and other International, local certifications and rating systems in buildings.

Thermophysics in buildings:

This course attempt to summarize the building enclosure and its energy performance, heat transfer and energy fluxes in the building structure, basic knowledge of heating and cooling loads, HVAC systems, renewable energy technologies and applications, thermal energy storage approaches in buildings to achieve energy efficient buildings or zero energy buildings. In addition to the factors affecting on building energy performance, heat resistance of enclosure, hybrid energy systems, environmentally responsive elements in buildings. Fundamentals of building energy requirements, barriers, LCA in buildings, International certifications and environmental rating approaches in buildings.