



TECHNOLOGICAL EDUCATION INSTITUTE OF
CENTRAL MACEDONIA
SCHOOL OF TECHNOLOGICAL APPLICATIONS
DEPARTMENT OF MECHANICAL ENGINEERING

Graduate Studies Program:
Academic Year 2014 - 15

**"Renewable Energy Systems: Design,
Development and Optimization"**

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Subject:

Covering the Thermal Needs of a House Using Novel Solar Systems

Introduction & Motivation:

A big fraction of the energy consumed in a house is spent to cover thermal needs such as space air conditioning, utility water etc. Aim of this thesis is to compile a case study in order to prove and promote the availability of options for covering the thermal needs of a house using solar energy systems towards more sustainable and self-supported buildings.

Implementation & Means:

An integrated is going to be followed. Any construction solutions or innovative systems will be considered together with the design of the building. All solutions to be applied will be derived from commercially available options as well as concepts already proven in literature. All considered options will be evaluated in a techno economic analysis in order to ensure the feasibility of the proposed design.

References:

[1] Soteris A. Kalogirou, Solar Energy Engineering: Processes and Systems, Academic

Press, 2009

[2] Russell H. Plante, Solar Energy, Photovoltaics, and Domestic Hot Water. A Technical and Economic Guide for Project Planners, Builders, and Property Owners, Academic Press, 2014

[3] Peter Gevorkian , Solar Power in Building Design: The Engineer's Complete Design Resource, McGraw-Hill, 2008

Requirements: *Background and interest in building design, solar energy systems, Life Cycle Analysis, spreadsheet calculation software.*