



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:

Geothermal Greenhouse Design and Heating System Calculations

Introduction & Motivation:

The design of a geothermal greenhouse requires knowledge of different aspects of energy utilization. Among these aspects are: the geothermal field, the water transmission, the structure design, the heating system and the disposal of waste water. The heating system is the most important factor and constitutes the main difference from greenhouses using conventional fuels. This project is a case study of a tomato producing greenhouse, located closed to the geothermal field of Nigrita (Serres, Greece).

Implementation & Means:

A literature survey for the geothermal greenhouse design will result in design methods. These design methods will be applied for a specific tomato producing greenhouse. A spreadsheet for the heating systems calculations will be developed.

References:

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| <p>[1] Dickson, M. H. & Fanelli, M. <i>“Geothermal Energy: Utilization and Technology”</i>, McGraw-Hill, New York, 2001.</p> <p>[2] Armstead, H. C. H. <i>“Geothermal Energy. Its past, present and future contributions to the energy needs of man”</i>, E. & F. N. Spon, New York, 1983.</p> <p>[3] Panagiotou C. <i>“Geothermal Greenhouse Design”</i> The United Nations University, Report Number 11, Reykjavik, Iceland, 1996.</p> <p>[4] Φυτίκας, Μ. & Ανδρίτσος, Ν. <i>“Γεωθερμία”</i>, Εκδ. ΤΖΙΟΛΑ, Θεσσαλονίκη, 2004.</p> |
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Requirements: *Knowledge needed for a successful dissertation.*

Grade Pass and above for the course E3: Geothermal Energy Systems of this Graduate Studies Program.