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"

Supervisor's Name : Dr Dimitrios Missirlis

Subject:

Parametric investigation of thermodynamic cycle performance for gas turbine applications

Introduction & Motivation:

Gas turbines are used in a wide range of applications. The goal of this thesis is to investigate the use of gas turbines and focus on their thermodynamic cycles and performance. This thesis will be based on a thermodynamic cycle analysis of the operation of gas turbines with the use of dedicated software (Cyclepad). The most common gas turbine components will be investigated and their effect on the overall gas turbine performance will be presented in relation to important gas turbine operational parameters. A parametric analysis will be performed which will provide useful data for this technology.

Implementation & Means:

- Theoretical analysis of gas turbine thermodynamic cycles and performance
- Creation of a 0-D model of a gas turbine with the use of dedicated software (Cyclepad)
- Parametric analysis of thermodynamics conditions in relation to energy conversion optimization and performance of gas turbine

References:

[1] SOUVIK BHATTACHARYYA, Examining Staged Enhancements for Thermodynamic Cycles to Improve Performance using an Intelligent Instruction Software, Int. J. Engng Ed. Vol. 16, No. 4, pp. 340-350, 2000
[2] Adrian Irimescu, Dorin Lelea, Thermodynamic analysis of gas turbine powered cogeneration systems, Journal of Scientific & Industrial Research, Vol.69, July 2010, pp. 548-553

Requirements: Good knowledge of Applied Thermodynamics/Energy Conversion