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## SYLLABUS

# Exergy

200 HOURS

## SUBJECT/LEVEL

Energy engineering graduate level.

## LEARNING OUTCOMES

After completion of the course you will be able to:

- Explain and apply the exergy concept to real systems
- Reflect on sustainable development from an exergy point of view

## COURSE CONTENTS

The course is divided into two parts:

*Part 1. Exergy Fundamentals, 100 hrs.*

Fundamental energy and exergy concepts, Thermostatistics and thermodynamics, Cyclic processes, Heat transfer and Chemical processes.

*Part 2. Exergy Calculations, 100 hrs.*

Exergy analyses of different systems and process.

## RECOMMENDED REQUIREMENTS

Knowledge of basic mathematics and science, preferably engineering.

## TYPE OF TEACHING

The course is given as an Internet based academic course in English. Exercises and assignments are submitted on line and participants get personal feedback from the teacher. A forum for discussion is also available.

## EXAMINATION AND GRADES

Examination by hand in exercises. Grades will be given according to the scale A to F, where A is highest and F is failed.

## LITERATURE

Wall, G. *Exergetics* (1998) pp. 149, <http://www.exergy.se/ftp/exergetics.pdf>

Wall, G. *Exergy a Useful Concept within Resource Accounting* (1977) Report No. 77-42, 58, Institute of Theoretical Physics, Göteborg <http://www.exergy.se/ftp/ex77c.pdf>

Dincer, I & Cengel, Y. A. Energy and Exergy Concepts and Their Roles in Thermal Engineering, *Entropy* 2001, 3, pp. 116-149, <http://www.mdpi.com/1099-4300/3/3/116/pdf>

Gaudreau, K., *Exergy analysis and resource accounting* (2009) MSc thesis University of Waterloo, Ontario, Canada, [http://uwspace.uwaterloo.ca/bitstream/10012/4507/1/Gaudreau\\_Kyrke.pdf](http://uwspace.uwaterloo.ca/bitstream/10012/4507/1/Gaudreau_Kyrke.pdf)

Gaudreau, K., Fraser, R. A. & Stephen Murphy, S. The Tenuous Use of Exergy as a Measure of Resource Value or Waste Impact, *Sustainability* 2009, 1(4), pp. 1444-1463, <http://www.mdpi.com/2071-1050/1/4/1444/pdf>

Göran Wall December 1, 2010