

# Systèmes énergétiques : principes de bases et technologies durables

## Lecturers

Axel Coussement (Coordinator) and Alessandro PARENTE

## Course mnemonic

MECA-H301

## ECTS credits

5 credits

## Language(s) of instruction

French

## Course period

First term

## Course content

Reminder of fundamental concepts: systems, variables and states. Properties of pure substances. Work & heat. First principle of thermodynamics. Second principle of thermodynamics. Entropy & efficiencies. Irreversibility & exergy. Power & refrigeration cycles. Thermodynamic relations. Elements of combustion. 1D compressible flows. Introduction to turbomachines.

## Pre-requisites and co-requisites

### Pre-requisites courses

PHYS-H1001 | Physique générale I | 5 crédits

### Co-requisites courses

MECA-H3001 | Fluid mechanics and transfer processes | 5 crédits  
and PHYS-H101 | Connaissances fondamentales et éléments de physique | 10 crédits

### Course having this one as co-requisit

MECA-H3001 | Fluid mechanics and transfer processes | 5 crédits

## Teaching method and learning activities

lectures, exercises, laboratories

## References, bibliography and recommended reading

G. J. Van Wylen, R. E. Sonntag, P. Desrochers. *Thermodynamique appliquée*, Éditions du Renouveau Pédagogique, Montréal, 1992. Épuisé.

Yunus-A Cengel, Michael-A Boles, Marcel Lacroix. *Thermodynamique : Une approche pragmatique*, De Boeck, 2009

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## Other information

### Contact(s)

Service d'Aero-Thermo-Mécanique - CP 165/41 Bât L, Porte E, Niv 3, local 116A Tél : 02/650 26 48 - Fax : 02/650 27 10 Mail : gdegrez@ulb.ac.be

## Evaluation method(s)

Other

### Evaluation method(s) (additional information)

written exam (theory, closed book & exercises), laboratory reports.

### Determination of the mark (including the weighting of partial marks)

3/8 theory exam, 3/8 exercises exam, 1/4 laboratory mark

### Main language(s) of evaluation

French

## Programmes

### Programmes proposing this course at the Brussels School of Engineering

BA-IRBI | Bachelor in Bioengineering | unit 2 and BA-IRCI | Bachelor in Engineering Sciences | option Bruxelles/unit 3

### Programmes proposing this course at the faculty of Sciences

BA-IRBI | Bachelor in Bioengineering | unit 2