

Thermodynamics 2

Module Code:	MAE5003-A
Academic Year:	2018-19
Credit Rating:	10
School:	Department of Mechanical and Energy Systems Engineering
Subject Area:	Mechanical and Automotive Engineering
FHEQ Level:	FHEQ Level 5
Module Leader:	Professor Martin Priest

Additional Tutors:

Pre-requisites:

Co-requisites:

Contact Hours

Type	Hours
Lectures	20
Tutorials	12
Laboratory	10
Directed Study	56.5
Examinations DO NOT USE	1.5

Availability Periods

Occurrence	Location/Period
IPA	INTI International College, Penang / Semester 1 (Sep - Jan)
IPA	INTI International College, Penang / Semester 2 (Feb - May)
IPA	INTI International College, Penang / Semester 3 (June - Oct)
IIA	INTI International University / Semester 1 (Sep - Jan)
INA	INTI International University, Nilai / Semester 1 (Sep - Jan)
INA	INTI International University, Nilai / Semester 2 (Feb - May)
INA	INTI International University, Nilai / Semester 3 (June - Oct)
MSA	Management Development Institute of Singapore (MDIS) / Semester 1

Module Aims

To review Thermodynamics as the science of energy conversion; to apply the subject to the analysis of simple processes; to introduce heat transfer.

Outline Syllabus

1. Introduction to energy and the First Law of Thermodynamics
 - 1.1 Systems, energy, work, heat, properties, First Law.
 - 1.2 Processes: constant volume, constant pressure, adiabatic, isothermal, cycles.
2. Second Law of Thermodynamics
 - 2.1 Entropy via temperature - entropy diagrams.
 - 2.2 Reversible and irreversible processes: principle of increasing entropy.
3. Flow processes
 - 3.1 Steady flow; mass flow equation; steady flow energy equation.
- 4 Properties of Fluids
 - 4.1 Liquids and vapours: steam tables
 - 4.2 Ideal gases.
5. Application to non-flow and flow processes
6. Mixture of Gases and Vapours
 - 6.1 Mixtures of gas, and gases and vapours.
 - 6.2 Psychrometrics.
7. Heat Transfer
 - 7.1 Conduction, convection, radiation, evaporation.
 - 7.2 Overall heat transfer coefficients.
 - 7.3 Heat transfer correlations.
 - 7.4 Heat exchangers.

Module Learning Outcomes

On successful completion of this module, students will be able to...

- 1 1 Review the fundamental principles of thermodynamics and heat transfer and their application to the analysis of simple processes.
- 2 2 Measure and evaluate energy balances.
- 3 3.1 Better manage, present and interpret data.
 3.2 Solve problems systematically using the scientific method

Learning, Teaching and Assessment Strategy

The basic subject matter is established in lectures and example classes. An energy balance on a relevant subject will be examined in the laboratory.

Mode of Assessment

Type	Method	Description	Length	Weighting	Final Assess'
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Summative	Laboratory Report	Laboratory Report 500 words	-500 words	30%	No
Summative	Examination - closed book	Examination - closed book	1.5 hours	70%	Yes
Referral	Examination - closed book	Supplementary assessment: Examination (closed book) 2 hours	2 hours	100%	Yes

Legacy Code (if applicable)

ENG2034M

Reading List

To view Reading List, please go to [rebus:list](#).