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AREAS OF RESEARCH: ENERGY CONVERSION SYSTEMS,
POLLUTION (EMISSIONS) TECH.
RENEWABLE ENERGY SYSTEMS.

OFFICE HOURS: MON, TUES, THURS, → 12:00 - 12:45
ANY TIME IN OFFICE
OR BY APPOINTMENT.

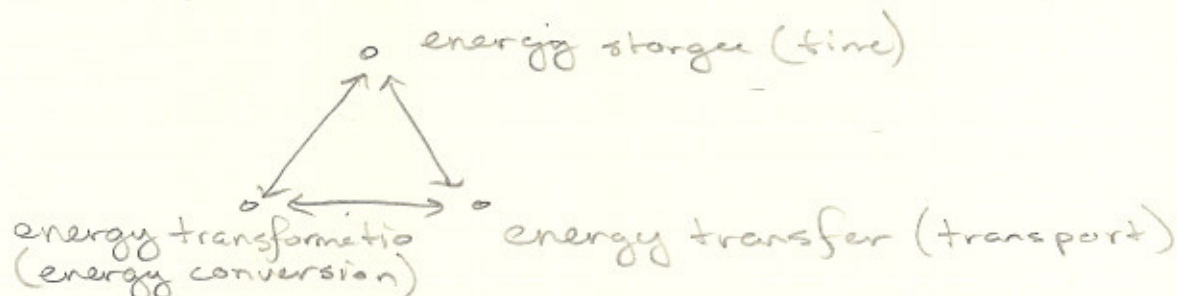
CHAPTER 1

§ 1.1 INTRODUCTION.

- what is thermodynamics?

thermodynamics is a science in which the storage, the transformation, and the transfer of energy.

- Energy: Capability to produce an effect.



- Thermodynamics.

it is made by latin words.

Therme means heat.

Dynamics means work (power.)

§ 1.2 ENERGY FORMS.

ex. internal energy (stored energy, temperature)
kinetic energy → motion.
potential energy → elevation
chemical energy → chemical composition.

- energy can be transferred from one form to another form.
- energy is transferred across a boundary as either heat or work.

§ 1.3 APPLICATIONS AREAS OF THERMODYNAMICS

it is hard to imagine an area which does not relate to thermodynamics in some respect, since every engineering activity involves an interaction between energy and matter.

§ 1.4 EXAMPLES

STEAM POWER PLANT - FIG. 1.1
 INTERNAL COMBUSTION ENGINE -
 SIMPLE NUCLEAR POWER PLANT - FIG 1.2
 REFRIGERATOR - FIG 1.6
 GAS TURBINE - FIG 1.10
 TURBO JETS - FIG 1.12

§ 1.5 REMARKS.

- Each thermodynamic system of these may be regarded as a continuum, in which the activity of the constituent molecules is averaged. Into measurable quantities such as, pressure, temperature, velocity, etc. Here we are talking about macroscopic or engineering thermodynamics. At the microscopic level, statistical thermodynamics however, deals with behaviour of individual molecules within a given thermodynamic system.
- In engineering we study the energy conversions and processes that occur in thermodynamic systems.

CHAPTER 2 BASIC CONCEPTS AND DEFINITIONS

§ 2.1 BASIC DIMENSIONS AND UNITS.

- Any physical quantity can be characterized by dimensions. The arbitrary magnitudes assigned to the dimensions are called units.

- Some basic dimensions such as mass ' m ', Length ' L ', time ' t ', and temperature ' T ' are selected as fundamental dimensions, while others such as velocity ' v ', Energy ' E ', and Volume ' V ' are expressed in terms of the fundamental quantities (dimensions) and are called secondary dimensions or derived dimensions
- Two sets of units are often used
 - International Standard (SI)
 - English system of units (Imperial)