## PROPERTIES OF MATTER

# Course Name : Properties of Matter

1. **Course Code : PHY1103**
2. **Credit hours : 2**
3. **Course Description**

This course introduces general concepts of Properties of Matter and requires 2 hours of lectures per week for 15 weeks i.e 30 contact hours in semester. It covers the following major topics:

* Forces and energy between Atoms and between Molecules
* Liquids.
* Solids.
* Thermal properties
* Transport phenomena in gases.

1. **Course Objectives**

At the end of the course the student should be able to:

* Distinguish between the different forces that hold atoms together.
* Explain why liquids rise or are depressed in a capillary tube.
* Explain the applications of the elastic properties of solids in the daily life.
* Explain thermal expansion of a solid in terms of interatomic forces
* Describe diffusion through a gas in molecular terms.
* Explain thermal conduction of gases in terms of transport of thermal energy.

# Course Outline

# Forces and energy between atoms and between molecules.

**Liquids**:

Surface tension; Capillarity; Adhesion and cohesion.

**Solids**:

Strength properties and elastic deformation; Brittle and ductile solids; Examples of bending a beam and the cantilever; Waves along an elastic bar.

**Thermal properties:**

Thermal expansion; Gruneisen’s law; Heat flow along a bar; Thermal diffusion.

**Transport phenomena in gases**:

Elements of kinetic theory; Viscosity; Thermal conductivity and self-diffusion.

1. **Reading List**

Flowers B.H. and Mendoza E., [*Properties of Matter*](http://newton.ex.ac.uk/teaching/modules/book-list-PHY.html#FLOWERS), Wiley and Sons Ltd.

Tabor D. (1996): Gases, Liquids and solids, Penguin Books.

Sears, W.F.Zemansky, M.W & Young, H.D. (1991): College Physics, Addison-Wesley Publishing Co.

Properties of Matter - : F.M. D’ujanga Lecture notes – Distance Education Department.