

PRE-REQUISITE: F.Sc. or equivalent

LEARNING OUTCOMES

At the end of this course a student is expected to have learnt

- fundamental laws of Newtonian Mechanics
- Fundamental laws of Thermodynamics.

CONTENTS:

Unit-1: Mechanics:

- 1.1. Using Newton's Law of Motion:
- 1.2. Particle in Equilibrium, Using Second Law of Motion:
- 1.3. Dynamics of Particle, Frictional Forces.
- 1.4. Work and Kinetic Energy, Work and Energy with Varying Forces,
- 1.5. Power, Gravitational Potential Energy, Conservative and Non-conservative forces,
- 1.6. Force and Potential Energy.

Unit-II: Heat and Thermodynamics:

- 2.1. Overview of the Universe, Solar system,
- 2.2. Sun as a source of energy, Earth as a planet,
- 2.3. Transfer of heat through Conduction, Convection and Radiation,
- 2.4. Weather Changes, Cloud Formation,
- 2.5. Entropy, Equation of State,
- 2.6. The Ideal Gas Equation,
- 2.7. The Van Der Waals Equations.

TEACHING-LEARNING STRATEGIES

- Lecture based examination
- Presentations/Seminars
- Class Discussion
- Quizzes

ASSIGNMENTS – TYPE AND NUMBER WITH CALENDAR

It is continuous assessment. The weightage of Assignments will be 25% before and after midterm assessment. It includes:

- classroom participation,
- attendance, assignments and presentation,
- homework
- attitude and behavior,
- hands-on-activities,
- short tests, quizzes etc.

RECOMMENDED TEXTBOOKS / SUGGESTED READINGS

1. Ames, J. S. (2017). Text Book of General Physics. Amer. Bk. Co 1904.
2. Walker, J. S. (2017). Physics 5th Edition, Pearson, UK.
3. Young, H. D., Freedman, R. A., & Ford, A. L. (2006). Sears and Zemansky's university physics (Vol. 1). Pearson education.
4. Boeker, E. and Van Grondelle, R. (2001). Introductory Environmental Physics. John Wiley and Sons Inc. New York, USA.
5. Routledge, S. C. (2001). Environmental Physics. Kentucky, USA.
6. Seinfeld, J. H. and Pandis, S. N. (2006). Atmospheric Chemistry and Physics: From Air Pollution to Climate Change. John Wiley and Sons Inc. USA.
7. Guyot, G. (1998). *Physics of the Environment and Climate*. Praxis publishing. UK.

Further Reading: As suggested by the Instructor.