

**Department of Physics**  
**Government Degree College Tangmarg**  
**Learning Outcomes of the graduate physics courses**

Besides developing the foundation of fundamental laws of physics, the outcome of the course is, the motivation for higher education, and to inculcate the innovative thinking among the students that inspires them for research. The learning outcome of different courses are summarized below:

**1. Classical Mechanics**

- a. Deep understanding and application of Newtonian physics.
- b. Application of coordinate systems and vector calculus.
- c. Concept of central force field and Keplars laws.
- d. physics of system of particles .
- e. interesting aspects of special theory of relativity.
- f. idea of spacetime.
- g. important aspects of harmonic oscillators

**2. Electrodynamics**

- a. application of gradient, curl and divergence.
- b. multipole expansion and the applications.
- c. foundations of electricity and magnetism.
- d. Use of Maxwell's equations

**3. Optics and waves**

- a. ideas of diffraction and polarization.
- b. optical fibre and applications.
- c. optics in day to day life.
- d. concept of accoustics and sound.

**4. Thermodynamics and statistical physics**

- a. Laws of thermodynamics and statistical mechanics, and applications.
- b. definition and importance of entropy and its connection with universe.
- c. thermodynamic potentials and Maxwell's relations.
- d. Understanding of real gases and Vander Wall's equation.
- e. Boltzmann statistics and other distribution laws.
- f. Maxwell's theory of velocity distribution.
- g. kinetic theory and applications.
- h. thermodynamics in day to day life.

**5. Modern Physics and quantum mechanics**

- a. Mathematical foundation of quantum mechanics.
- b. Schrodinger equation and application.
- c. Black body radiation laws.
- d. understanding of atomic physics.

**6. Solid State Physics**

- a. concept of unit cell, translation, diffraction and reciprocal lattice.
- b. understanding crystal structure and symmetries of solids.
- c. concept of phonon.
- d. details of free electron gas.