Devrukh Shikshan Prasarak Mandal's

Nya. TATYASAHEB ATHALYE ARTS, Ved. S.R. SAPRE COMMERCE & Vid. DADASAHEB PITRE SCIENCE COLLEGE, DEVRUKH [AUTONOMOUS]

Syllabus for F.Y. B.Sc.
Program: B.Sc.
Course: Physics
Credit Based Semester and Grading System with the Effect from
Academic Year 2020-21

Syllabus for B.Sc. Physics (Theory and Practical)
As per credit based system
First Year B.Sc.2020–2021.

The revised syllabus in Physics as per credit based system for the FirstYear B.Sc. Course will be implemented from the academic year **2020–2021.**

Preamble:
The systematic and planned curricula from these courses shall motivate and encourage learners to understand basic concepts of Physics.

Objectives:
- To develop analytical abilities towards real world problems
- To familiarize with current and recent scientific and technological developments
- To enrich knowledge through problem solving, hands on activities, study visits, projects etc.

Course code	Title	Credits
Semester I		
USPHT11		2
USPHT12		2
USPHP1	Practical I	2
		Total – 06
Semester II		
USPHT21		2
USPHT22		2
USPHP2	Practical II	2
		Total - 06

Semester II: Paper I

Name of the Programme	Duration	Semester	Subject
B.Sc. In Physics	Six Semesters	II	
Course Code	**Title**	**Credits**	Physics
USPHT21		2 for USPHT21	

Unit I   **15 lectures**

1. Scalars, Vectors, Vector algebra, Magnitude, Rectangular unit vectors, resolution / components of a vector, Unit vector, Problems based on Vector algebra.

2. Scalar, Vector, scalar triple and vector triple products and their properties, Projection of a vector onto another vector, concept of torque, Problems and applications based on Scalar, Vector and Triple products.

Unit II   **15 lectures**

Elasticity: Review of Elastic constants Y, K, η and σ; Equivalence of shear strain to compression and extension strains. Relations between elastic constants, Couple for twist in cylinder.

Behavior of real gases and real gas equation, Van der Waal equation, Latent heat, methods of cooling – freezing mixer, Cooling by evaporation, cooling by adiabatic expansion, Concept of refrigerator

Unit III   **15 lectures**

Laser : Introduction, transition between Atomic energy states (without derivation), Population Inversion, Pumping, Principle of Laser, Properties of Laser, He-Ne Laser, Application of Laser

Fibre Optics : Fibre construction, Geometry. Total Internal Reflection, Light propagation through fibres, numerical aperture. Applications of optical fibres.

Wave Motion: Definition, Wave equation and its solution (without derivation), wavelength, period, frequency, wave number, propagation constant. Types and properties of waves, Group velocity, Phase velocity, Wave intensity. Transverse waves on string.

References
1. MS:Murray R Spiegel, Schaum's outline of Theory and problems of Vector Analysis, Asian Student Edition.
2. CH**:** Charlie Harper, Introduction to Mathematical Physics , 2009 (EEE) PHI Learning Pvt. Ltd.
3. H. C. Verma, Concepts of Physics – (Part–I), 2002 Ed. Bharati Bhavan Publishers.
4. Brijlal,Subramanyam and Avadhanulu A Textbook of Optics, 25th revised ed.(2012) S. Chand

5. Modern Physics Concept and Applications – SanjeevPuri, Narosa Publication.
6. The Physics of Vibrations and Waves, H. J. Pain, 2013, John Wiley and Sons.7.The Physics of Waves and Oscillations, N.K. Bajaj, 1998, Tata McGraw Hill.