Academic Council

Item No:_____

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 2019-20

Syllabus for B.Sc. Physics (Theory &Practical)
As per credit based system
First Year B.Sc. 2019–2020.

The revised syllabus in Physics as per credit based system for the First Year B.Sc. Course will be implemented from the academic year **2019–2020.**

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		
ASPUSPHY101	Classical Physics, Optics and Thermodynamics	2
ASPUSPHY 102	Modern Physics and Digital Electronics	2
ASPUSPHYP 1	Practical I	2
		Total= 06
Semester II		
ASPUSPHY 201	Mathematical Physics, Optics and Wave Mechanics	2
ASPUSPHY 202	Electronics, Modern Physics and Electrostatics	2
ASPUSPHYP 2	Practical II	2
		Total=06

Semester I: Paper I

Name of the Programme	Duration	Semester	Subject
B.Sc. in Physics	Six semesters	I	Physics
Course Code	Title	Credits	
ASPUSPHY101	Classical Physics, Optics and Thermodynamics	2for USPH101	

Learning Outcomes:

On successful completion of this course students will be able to:

1. Understand kinematical equations
2. Understand the concepts of friction and the concepts of elasticity, fluid mechanics and be able to perform calculations using them.
3. Understand the concepts of lens system, diffraction and interference.
4. Apply the laws of thermodynamics to formulate the relations necessary to analyse a thermodynamic process.
5. Demonstrate quantitative problem solving skills in all the topics covered

Unit I **15 Lectures**

1.Kinematical Equations, Moment of Inertia , Torque

2. Elasticity:

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

3. Fluid Dynamics:

Equation of continuity, Bernoulli's equation, applications of Bernoulli's equation, streamline and turbulent flow, lines of flow in airfoil, Poiseuille's equation(formulae only).

Unit II **15 Lectures**

1.Lens Maker's Formula (Review), magnification-lateral, longitudinal and angular. image formation in thin lens f and 2f.

2. Equivalent focal length of two thin lenses, cardinal points of thick lens, Ramsden and Huygens eyepiece.

3. Aberration: Spherical Aberration, Chromatic aberration

4. Interference: Interference in thin films, Fringes in Wedge shaped films, Newton's Rings

5. Diffraction

Concept of diffraction, single slit and straight edge, difference between Fresnel and Fraunhofer diffraction

Unit III **15 Lectures**

1. Behaviour of real gases and real gas equation, Van der Waal equation
2. Thermodynamic Systems, Zeroth law of thermodynamics, Concept of Heat, The first law, Non Adiabatic process and Heat as a path function, Internal energy, , Heat Capacity and specific heat, Applications of first law to simple processes, general relations from the first law, Indicator diagrams, Work done during isothermal and adiabatic processes, Worked examples, Problems

Note: A good number of numerical examples are expected to be covered during the prescribed lectures.

References:

1. Halliday, Resnick and Walker, Fundamental of Physics (extended) – (6th Ed.), John Wiley and Sons.
2. H. C. Verma, Concepts of Physics – (Part–I), 2002 Ed. BharatiBhavan Publishers.
3. Iradov
4. Brijlal,Subramanyam and Avadhanulu A Textbook of Optics, 25th revised ed.(2012) S. Chand
5. Brijlal, Subramanyam and Hemne, Heat Thermodynamics and Statistical Physics, S Chand, Revised, Multi-coloured,2007 Ed.
6. Jenkins and White, Fundamentals of Optics by (4th Ed.), McGraw Hill International.

Additional References:

1. Thornton and Marion, Classical Dynamics – (5th Ed)
2. D S Mathur, Element of Properties of Matter, S Chand & Co.
3. R Murugeshan and K Shivprasath, Properties of Matter and Acoustics S Chand.
4. M W Zemansky and R H Dittman, Heat and Thermodynamics, McGraw Hill.
5. D K Chakrabarti, Theory and Experiments on Thermal Physics, (2006 Ed) Central books.
6. C L Arora, Optics, S Chand.
7. Hans and Puri, Mechanics –, 2nd Ed. Tata McGraw Hill