

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 First Year 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 II

| Name of the Programme | Duration | Semester | Subject |
|-----------------------|---------------|---------------|---------|
| B.Sc. In Physics | Six Semesters | II | Physics |
| Course Code | Title | Credits | |
| USPHT22 | | 2 for USPHT22 | |

Unit I

15 lectures

1. Basics related to electrical circuits – Ohm's law, KCL, KVL, series and parallel arrangement of resistances, etc.
2. Network Theorems – Thevenin's, Norton's, superposition and maximum power transfer theorem and related problems.
3. Transient response of circuits – Behaviour and equations of capacitor and inductor. Step responses of CR, LR circuits, time constant and its significance.

Unit II

15 lectures

1. Radioactivity: half-life, mean life, units of radioactivity, successive disintegration and equilibriums. Carbon dating, other applications of radioisotopes (Agricultural, Medical, Industrial, Archaeological).
2. Atom models – Thomson, Rutherford and Bohr's postulates of H atom, velocity, radius and Energy of electron in nth bohr orbit, hydrogen spectrum.
3. Compton Effect, Pair production.

Matter waves, wave particle duality, Davisson-Germer.

Unit III

15 lectures

1. **Semiconductors:** Semiconductors, bond structure in silicon, Intrinsic semiconductor, p and n types, temperature dependence, pn junction, depletion layer, forward and reverse bias, drift and diffusion currents.

2. Diode characteristics, Half wave, Full wave and Bridge rectifiers, Rectification efficiency and ripple, Capacitor Filter, Zener diode as voltage stabilizer.

3. BJT: Construction, doping levels and sizes of E, B and C, types and symbols, working of transistor. CB, CE and CC Configurations, Characteristics – CB and CE, current gains.

References:

1. CR: D. Chattopadhyay, P C Rakshit , Electricity and Magnetism 7th Ed. New Central Book agency.
2. TT :B.L. Theraja and A.K. Theraja , A Textbook of Electrical Technology Vol. I , S. Chand Publication.
3. VKM: V K Mehta and R Mehta Electronics Principals, Multicoloured Revised 11th Ed. reprint in 2012 ,S Chand.
4. Arthur Beiser, Perspectives of Modern Physics : Tata McGraw Hill.

