

Dayanand Science College, Latur

Department of Physics

B.Sc Physics Course outcomes

B. Sc First Year Physics

- **Course Name:-** : Mechanics and Properties of Matter
- **Course Number:-** CCP I - (Section A) P-I
- **Outcomes:-**
 1. The objective of this course is to introduce the students to the world of mechanics and properties of the matter that exists in different phases i.e., solid, liquid and gas.
 2. Laws of motion and its applications to various systems studied in this paper is of fundamental nature and enable the students to handle different types of problems and is the pre-requisite for several other advanced courses in physics and chemistry.
 3. The pre-requisite for this course is knowledge of calculus, wave theory and modern physics. This course is the core course and every student pursuing B Sc with physics as one of the optional is required to study this course.

- **Course Name:-** : Mathematical Methods in Physics
- **Course Number:-** CCP I - (Section B) P-II
- **Outcomes:-**
 1. This course is also aimed to develop knowledge in mathematical physics and its applications, to develop expertise in mathematical methods required in the study of Physics, to develop critical thinking and problem solving skill.
 2. After completion of this course students will be able to apply the concept of vectors and complex variables to various physical quantities.
 3. This course will also enable the students to solve the problems related to partial differentiation. Fourier analysis unit will enable the students to analyze the periodic functions.

- **Course Name:-** : Heat and Thermodynamics
- **Course Number:-** CCP II - (Section A) P-III:
- **Outcomes:-**
 1. This course will introduce the students to the world of heat and thermodynamics and the behaviour of the physical systems at different thermodynamically conditions.
 2. After completing this course students will understand the difference in the behavior of the ideal and real gases, transport phenomenon in gases.
 3. Students will also understand the working of various heat engines and the ways to increase their working efficiency.

- **Course Name:-** : Electricity and Magnetism
- **Course Number:-** CCP II - (Section B) P-IV
- **Outcomes:-**
 1. The objective of this course is to introduce the students to the concepts of static and dynamical electrical magnetic fields, the sources for generating such fields, polarization and induction effects, understand the basic difference between the DC and AC circuits and their functioning.
 2. This course is of most applied nature and will enable the students to understand the role of electricity in everyday life, relate electrical conduction, vlate using Ohm's law
 3. And will also enable the students to understand the working principles of various electrical components and gadgets.
 4. After completion of this course students will be able to apply the concept of vectors and complex variables to various physical quantities.

B. Sc Second Year Physics

- **Course Name:-** Waves and Oscillations
- **Course Number:-** : CCP III - (Section A) P-VI
- **Outcomes:-**
 1. The objective of this course is to introduce the students to the concepts of mechanical waves, their properties, propagation and reflection properties, formation of standing waves, their applications in resonance tubes, energy distribution in the standing waves, free and forced vibrations, acoustics and acoustical designs and also introduces the students to the concepts of ultrasonic waves and their applications.
 2. This course is the pre-requisite for several advanced courses in physics and chemistry and is necessary for understanding the behavior of the mater when mechanical waves passes through them.
 3. Pre-requisite for this course is the knowledge of elementary mathematics and calculus, wave theory, etc. This forms the core course of the programmes and every student pursuing B Sc with physics as one of the optional is required to study this course.

- **Course Name:-** Statistical Physics, Electromagnetics and Theory of Relativity
- **Course Number:-** : CCP III - (Section B) P-VII
- **Outcomes:-**
 1. The objective of this course is to introduce the students to the concepts of macroscopic world, statistical approaches for understanding properties of the macroscopic bodies, ensembles, their classification on the basic of macroscopic and microscopic basis, their applications to photonic and electronic gases, electromagnetism, Maxwell's equations and their applications in the electromagnetic waves, energy carried by the EM waves and theory of relativity.
 2. This course is the prerequisite for several advanced courses in physics, chemistry, life sciences and the modern communication systems. Pre-requisite for this course is the knowledge of elementary mathematics and calculus.

3. This forms the core course of the programmes and every student pursuing B Sc with physics as one of the optional is required to study this course.

- **Course Name:-** Optics and Lasers

- **Course Number:-** : CCP IV - (Section A) P-VIII Core

- **Outcomes:-**

1. This course is aimed to introduce the students to important core subject optics and its applications.
2. This course begins with the introduction to the concepts of geometrical optics, properties of optical instruments, interference and diffraction of light, polarization of light and finally introduces to the advanced source like LASERS and conditions for the lasing action.
3. This course is the advanced course having applications in nearly all the branches of science.
4. Pre-requisite for this course is the knowledge of light waves and their properties in different media and requires the knowledge of EM waves. This forms the core course of the programmes and every student pursuing B Sc with physics as one of the optional is required to study this course.

- **Course Name:-** Basic Electronics

- **Course Number:-** : CCP IV - (Section B) P-IX

- **Outcomes:-**

1. After completing this course students will be able to Identify and understand construction and properties of different types of P-N junction diodes
2. Apply knowledge of semiconductor devices to use them in different combinations to see their applications as amplifiers and oscillators
3. Design different circuits using semiconductor devices and demonstrate their usage.

- **Course Name:-** Skill Enhancement Course I B. Electrical Measurements
- **Course Number:-** : CCPS I - (Section A) SEC-I
- **Outcomes:-**
 1. This is a skill based course and is aimed to acquire skills related to characteristics and usage of the instruments for measurement of the electrical quantities like voltage, current, impedance and various other quantities using analogue and digital meters.
 2. The students will learn the skills selecting meters of proper scales, connecting and handling them and also to use them. As this is a skill based course therefore it is expected that students will spend nearly half of the time in laboratory for gaining hands-on training.
 3. This course is the pre-requisite for several advanced courses in physics, chemistry, and in almost all other disciplines. Pre-requisite for this course is the knowledge of physical quantities and their measurement.
- **Course Name:-** Skill Enhancement Course II A. Electronic Devices and Equipments
- **Course Number:-** : CCPS I - (Section B) SEC-II
- **Outcomes:-**
 1. This is a skill based course and is aimed to educate students about the working and usage of electrical appliances and other electrical devices.
 2. This course enables the students to know the behavior of active and passive devices under ac and dc conditions and also to use them for designing various circuits such as signal generators and amplifiers. As this is a skill based course, therefore, after completing this course the students will be able to acquire skills and apply them in daily hood purpose.
 3. As this course is of do-it-yourself nature, therefore, the students are required to spend more than half of the time in laboratory. This course is the pre-requisite for several advanced courses in physics, chemistry, and in almost all other disciplines.
 4. Pre-requisite for this course is the knowledge of semiconductor physics, knowledge of the semiconductor devices and their characteristics.

B. Sc Third Year Physics

- **Course Name:-** Quantum Mechanics
 - **Course Number:-** P-XII DSEP I (Section A)
 - **Outcomes:-**
 1. The objective of this course is to introduce the students to the world of microscopic particles such as molecules, atoms, atomic nuclei and elementary particles, study their dynamics employing wave analogy, and also to make the connections between the rules governing the microscopic particles with that of the macroscopic bodies around us.
 2. This course is the pre-requisite for several advanced courses in physics and chemistry and is necessary for understanding the behavior of molecules, atoms and elementary particles.
 3. The pre-requisite for this course is knowledge of calculus, wave theory and modern physics. This course is the core course and every student pursuing B Sc with physics as one of the optional is required to study this course.
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- **Course Name:-** A. Solid State Physics
 - **Course Number:-** P-XIII A - DSEP I (Section B)
 - **Outcomes:-**
 1. This course is designed to provide fundamental knowledge of the crystallography, principles behind the formation of matter, their structure and physical properties.
 2. This course also enables the students to understand the relationship between the internal structure and various properties of matter such as periodicity, structure and bonding in solids, making these solids an attractive material for the device applications.
 3. At the end of this course, students will be able to classify the materials in different classes based on their physical, thermal, electrical, and magnetic properties. This is an elective course of 02 credits offered at Semester V.

- **Course Name:-:** Atomic, Molecular & Nuclear Physics
- **Course Number:-** P-XIV DSCP II (Section A)
- **Outcomes:-**
 1. Aim of this course is to introduce the students to the world of physics of atoms, molecules and nuclei, their structures, emission of Gamma rays, X-rays, optical and microwave spectra from these systems, the interaction of atoms and molecules with electric and magnetic fields.
 2. This course also provides adequate knowledge on the nuclear energy sources and reactions with its application in establishing nuclear reactors.

- **Course Name:-:** Digital and Communication Electronics
- **Course Number:-** P-XV A - DSEP II (Section B)
- **Outcomes:-**
 1. This course enables the students to understand the importance and interconvertibility of various number systems, principles of digital gates, and working principle of communication systems.
 2. After completing this course students will be in a position to know the working of communication systems i.e., modulators, demodulators, transmitters and receivers, etc.
 3. Students will be able to apply these concepts in future assignments.

- **Course Name:-:** Skill Enhancement Course: B. Electrical Circuit Analysis Skill
- **Course Number:-** SEC III (B)
- **Outcomes:-**
 1. Aim of this course is to create awareness among the students about the electrical circuits, wiring of the electrical appliances and enable them to check for troubleshoots through hands-on exercises.
 2. This course introduces the students to various electrical components including their characteristics and power losses.
 3. As this course is of skill based, therefore, after completing this course students will not only be able to check the electrical connections at house-hold but will

also learn the skill to repair the electrical appliances for the general troubleshoots and wiring faults

- **Course Name:-**. Skill Enhancement Course Physics Workshop Skills
- **Course Number:-** SEC IV (A)
- **Outcomes:-**
 1. Aim of this course is to create awareness among the students about the mechanical, electrical and electronic tools through hands-on activities.
 2. This course introduces the students to the workshop skills like cutting, drilling, filing, different types of AC and DC generators, soldering-desoldering of electrical and electronics components, constructing regulated power supplies, etc.,
 3. Therefore, after completing this course students will gain skills of using various workshop tools and also to find faults and general troubleshoots and wiring faults.