

**BSC SEM-V P-I**

**COURSE CODE:20.170**

Name of the department : Physics

Name of the course: QUANTUM MECHANICS

Course objective : To provide a new concept to solve the problems at microscopic dimensions.

Course Outcome:

1. After completion of first unit students will be able to know the drawbacks of classical theories and can form a new concept.
2. The second unit gives a relationship between olden and new concepts of physics.
3. The students will be able to solve primary problems and can make a decisive argument for one dimensional problems at micro level.
4. They can apply the concept on three dimensional problems.
5. After completion of the course they will be able to throw light on the atomic structure and can solve any problem at micro level.

Assessment Method: oral test discussion and exam's.

Text Book : 1. Advance Quantum Mechanics- Styapakash

2. Introduction to Quantum mechanics –David J. Griffiths

## **BSC SEM-IV P-I**

### **COURSE CODE:20.130**

Name of the department : Physics

Name of the course: Relativity and Modern Physics

Course objective : To introduce with the modern concepts of physics and to solve the problems occurring with speed of light.

Course Outcome:

1. After completion of first unit students will be able to know the drawbacks of classical theories for the propagation of light in vacuum and can form a new concept.
2. The second unit gives a new set of equations which clarifies that no material medium is required for propagation of light waves and also about the relative motion of the bodies.
3. The students will be able to know about wave particle duality.
4. They get aware that how a wave travels in the space and what is the concept of group waves.
5. After completion of the course they will have a relativistic tool and they can decide the problems in two ways; relativistic or nonrelativistic.

Assessment Method: oral test discussion and exam's.

Text Book : 1. Modern Physics – R. Murugesan

2. Elementary Modern Physics- A.P. Arya.

## **BSC SEM-III P-I**

### **COURSE CODE:20.090**

Name of the department : Physics

Name of the course: Heat and Thermodynamics

Course objective : This course has a simple objective that according to what rule the interconversion of heat into useful work is done. The course provides the concept of energy related to a thermal system.

Course Outcome:

1. After completion of first unit students will be able to know the concept of heat and temperature and how work and heat is related. They get aware with the two laws of thermodynamics and in the last the unit creates a problem for second unit.
2. The second unit gives the proper solution for the problem created by first by Second law of thermodynamics, which forms the basis of heat engines.
3. The third unit defines a new physical quantity ENTROPY necessary for the complete description of thermal systems.
4. The last unit summarizes the above result in form of four Maxwell equations and many of the practical problems of thermodynamics are solved.
5. After completion of the course they will have a solid concept related to the happening of thermal systems.

Assessment Method: oral test discussion and exam's.

Text Book : 1. Heat and thermodynamics- K.W. Zeemansky

2. Heat and Thermodynamics – Brij Lal and N. Subramaniyam

## **BSC SEM-II P-II**

### **COURSE CODE:20.060**

Name of the department : Physics

Name of the course: Kinetic Theory of Gases

Course objective : To provide the basic idea of gaseous state of the matter, reason for their movement and state change with examples.

Course Outcome:

1. After completion of first unit students will be able to know that what is a gas, which are the physical variables needed for their description. Some experimental basic laws are discussed and a definition of ideal gas is made at the end.
2. With the concept of first unit the second unit discusses the reason of movement of gas molecules and generates the important characteristic properties of the gases.
3. This unit gives the practical application and generates a need for new equation for the state, applicable on real gases which shows deviation from ideal behavior.
4. With the state equation for real gases, the fourth unit provides the basic concept to liquification of different gases.
5. After completion of the course they will have a complete concept about real and ideal gases. The basic reasons governing their motion and state change.

Assessment Method: oral test discussion and exam's.

Text Book : 1. Heat and thermodynamics- K.W. Zeemansky

2. Heat and Thermodynamics – Brij lal and N. Subramaniam

## **BSC SEM-I P-II**

### **COURSE CODE:20.020**

Name of the department : Physics

Name of the course: Oscillations and Waves

Course objective : The simple objective of this course is to provides the concept of a new kind of motion related to our surrounding and very important in discussing the many new theories in modern atomic level physics.

Course Outcome:

1. Firstly the course provides the meaning of idea oscillatory motion and generates the necessary conditions for such motions in its first unit.
2. With the concept of first unit the second unit discusses the real oscillatory motions. The unit also discusses the causes of loss of energy in real oscillatory motions.
3. This unit gives the information about waves formed due to different types of vibrations. How they superposed is also discussed and with the example of sound waves the amount of energy is calculated which is transferred during propagation of waves.
4. Finally the course ended with the beat formation and the concept of wave packet.
5. After completion of the course the students will be able to discuss wave motion and vibration of particles. They will also be able to use the results in developing many of the models used in explaining properties of solids, liquid and gases.

Assessment Method: oral test discussion and exam's.

Text Book : 1. Oscillations and waves – N. K. Bajaj

2. oscillations and waves- Dongare and Bhattacharya

## **BSC SEM-VI P-III**

### **COURSE CODE:20.240**

Name of the department : Physics

Name of the course: Optoelectronics and Photonic Devices

Course objective : This course is the most applicable course of the department which provides the physics behind many of our daily used household things like LED, Solar Cell, LASERS, Photography, Holography etc.

Course Outcome:

1. The first unit gives the principle and interesting uses of LED, Photodiode and Solar Cells.
2. In the second unit the basic concept of microwave and an Laser were discussed. This unit provides the tool for the designing the different types of Lasers.
3. The different types of Lasers were developed and designed. The comparison of different Lasers classify their use in industry, war and health related human beings.
4. The last unit of the course discuss a very different use of Lasers in forming holograms. This also discusses the basic difference between 2D and 3D images.
5. After completion of the course students have a knowledge og the principles involved in lots of surrounding equipment's and they will also be able in designing some new needful equipment's in daily life.

Assessment Method: oral test discussion and exam's.

Text Book : 1. Handbook of Electronics –Gupta and Kumar.

2. Modern Physics – R. Murugesan

## **BSC SEM-V P-II**

### **COURSE CODE:20.180**

Name of the department : Physics

Name of the course: Atomic and Molecular Physics

Course objective : this course covers the knowledge of structure of atom and molecule. Mainly the course provides the models for the change in the properties of atoms and molecule when radiated. The models are justified experimentally and with some rules the properties of atom and molecules are identified and predicted.

Course Outcome:

1. The first unit of the course makes a model for the structure of atom and their spectra.
2. Second unit uses the model developed in first and completely differentiate the spectra of one electron and many electron atom. The energy calculations associated with different atoms were also calculated.
3. The spectrum and energy distribution in molecules are discussed in context of the total energy with some new models.
4. The complete calculation of energy associated with molecule is made with new type of motion of molecules. Certain specific spectra were discussed and the result are generalized to several of atoms. The occurrence of specific spectra is then justified with the modern concepts of physics and explained.
5. After completion of the course students have knowledge about the different types of energy associated with atom and molecule. They will be able to discuss and predict the properties and the distribution of electrons in different situations.
6. Assessment Method: oral test discussion and exam's.

Text Book : 1. Introduction to Atomic Spectra- H.E. White

2. Atomic and Molecular Spectra: Laser- Raj Kumar.

## **BSC SEM-VI P-I**

### **COURSE CODE:20.220**

Name of the department : Physics

Name of the course: Nuclear And Particle Physics

Course objective : the course provides rules to understand the basic properties and structure of nucleus. It also predicts models for the structure of nucleus and its constituent particles which are very useful in discussing the properties of elements like energy, color, nature etc.

Course Outcome:

1. The first unit of the course provides the knowledge about the structure and basic properties of the nucleus and its stability.
2. In the second unit the properties of the nuclear forces were discussed and with help of and the types of nuclear reaction throws a light on interaction of charge particles with matter.
3. The third unit of the course develops some models to understand the structure of nucleus and explains the process of nuclear reactions.
4. The last unit of the course introduces the existence of more elementary particles. How these particles are distributed and what properties does they bear were also discussed.
5. After completion of the course students can get a good knowledge of nuclear structure, nuclear particles and their interactions. The students can also predict the several of properties of matter.

Assessment Method: oral test discussion and exam's.

Text Book : 1. Nuclear Physics- Tayal

2. Fundamentals of Nuclear Physics- B. B. Srivastava.



## **BSC SEM-II P-III**

### **COURSE CODE:20.070**

Name of the department : Physics

Name of the course: Magnetostatics and Electric Current

Course objective : this course is designed to provide the basic knowledge about the magnetic field and its determination in different cases of flow of current which is useful in forming the four Maxwell's equations in electrodynamics. The course also provides the relation of variation in current and charge in different types of circuit elements.

Course Outcome:

1. The first unit of the course provides the knowledge about the different types of forces acting in a current carrying conductor in the presence of external magnetic field.
2. In the second unit the laws were developed to calculate the magnetic field in various situations.
3. The third unit of the course defines the d.c. current and its measurements in different elements.
4. The last unit of the course introduces the concept of a.c. current and its measurement in different types of circuits with the consumption of power.
5. After completion of the course students will be able to determine magnetic field intensities in various cases. They can also solve the problems involving the a.c. and d.c. currents in different circuits.

Assessment Method: oral test discussion and exam's.

Text Book : 1. Introduction to Electrodynamics- David J. Griffiths

2. Electromagnetic Theory- Satyprakash

## **BSC SEM-I**

### **COURSE CODE:20.040**

Name of the department : Physics

Name of the course: Practical Course (Experimental Work)

Course objective : This course provides the understanding of the theories discussed in different courses.

Course Outcome:

1. The determination of acceleration due to gravity by compound pendulum clears the concept of simple harmonic motion.
2. Use of spectrometer for refractive index determination clears the concept of propagation of light in different medium.
3. The determination of resistance of galvanometer is related with the primary circuit devices voltmeter and ammeter and their interconversion.
4. The frequency determination of a.c. mains provides a concept of Damped Harmonic Oscillation and electromagnetism.
5. Characteristics of Zener diode introduces the concept of voltage regulation.
6. The use of Sextant uses the laws of reflection of light.

Assessment Method: oral test discussion and exam's.

Text Book : 1. Practical Physics- C. L. Arora

2. Practical Physics- Gupta Kumar

## **BSC SEM-II**

### **COURSE CODE:20.080**

Name of the department : Physics

Name of the course: Practical Course (Experimental Work)

Course objective : This course provides the understanding of the theories discussed in different courses.

Course Outcome:

1. The Child's Law is based on the concept of Thermionic Emission.
2. The Experiment with Meldes method provides a better understanding of frequency determination in waves.
3. The determination of elastic constants provides an understanding of elastic properties of solids.
4. The experiment with Flywheel clears the concept of rotational motion and inertia.
5. Photocell experiment explains the quantum behavior of light.
6. Viscosity of water determination explains the properties of liquids.

Assessment Method: oral test discussion and exam's.

Text Book : 1. Practical Physics- C. L. Arora

2. Practical Physics- Gupta Kumar