Name of Faculty	:	Faculty of Science
Name of Program	:	Bachelor of Science
Course Code	:	2BSB04
CourseTitle	:	Physics-II
Type of Course	:	Basic Science
Year of Introduction	:	2023-24

Prerequisite	:	Develop basic knowledge of Physics	
Course Objective	:	In physics students also learn about circuit on AC, DC& Dynode. Also learn on Electrostatics Field, Coulomb's law. How to work plasma in physics on this basis students learn plasma physics and Nuclear Physics.	
Course Outcomes	:	Atthe endofthis course,students willbeableto:	
	CO1	Understand about Electronic circuit and type of circuit ex. Diode, AC, DC circuit	
	CO2	Application of Coulomb's law, Gauss's law and Electrostatics field	
	CO3	Understand about Plasma Physics ex. Composition of plasma, colloids.	
	CO4	Application of comparison of plasma and type of plasma	
	CO5	Application of Conductivity	
	CO6	Understand about Nuclear physics and its tool and radioactivity and Q-equation.	

Teaching and Examination Scheme

Teaching Scheme (Contact Hours)			Credits	Examination Marks				
				Theory Marks		Practical Marks		Total Marks
L	T	P	C	SEE	CIA	SEE	CIA	
3	0	2	4	50	25	50	25	150

*Legends: **L**-Lecture; **T**–Tutorial/Teacher Guided Theory Practice; **P** – Practical, **C** – Credit, **SEE** – Semester End Examination, **CIA** - Continuous Internal Assessment (It consists of Assignments/Seminars/Presentations/MCQ Tests, etc.)*

CourseContent

Unit No.	Topics	Teaching Hours	Weightage	Mapping WithCOs
1	**Electric and Electronic Circuits** **1. Diode Circuit** -Half wave rectifier - Full wave rectifier - Bridge rectifier - The inductor filter - The capacitor filter - L-C filter **2. AC Bridge** - Condition for bridge balance - Maxwell bridge - Hay bridge - Schering bridge -Wean bridge **3. DC Circuits:** - Growth and Decay of current in L-R Circuit - Nature of Graphs - Growth and Discharge of Charge in C-R Circuit - Discharge of Capacitor through an Inductance	11	24.44%	CO1
2	**Electrostatics** - Coulomb's Law - Electric Field - Electric Flux - Gauss' Law (Integral Form) - Gauss' law (Differential Form) - Application of Gauss Law (i) The Field due to an infinite layer of positive charge with uniform surface density (ii) The field outside an isolated charged sphere - Electrostatic Potential - Relation between the field and the potential. Ex. The potential and field produced by a ring of charges at a point on the axis of ring. - Two important relations - Electrostatic Energy. - Electric Dipole. Potential due to dipole, Electric Field in Cartesian & Polar Co-ordinates. - Dipole in Uniform Electric field. - Mutual Potential Energy of Two Dipoles.	11	24.44%	CO2
3	**Plasma Physics** - Introduction - Composition and characteristics of plasma - Collision - Surface phenomena - Transport phenomena - Diffusion and Mobility- Ambipolar diffusion	11	24.44%	CO3 CO4

DocumentVersion:1.0

	- Viscosity : Conductivity - Recombination - Ohm's Law - Comparison of various natural and manmade plasma - Plasma diagnostics - Plasma waves and instabilities: confinement of plasma - Space plasma			
4	**Nuclear Physics** 1: Physical Tools for Doing Nuclear physics - Introduction - Interaction between Particles and Matter- A brief Survey - Detectors for Nuclear Particles - Proportional Counter - Scintillation Counter - Spark Chamber **2: Radioactivity** - Introduction - Properties of Radioactive Rays - The Law of Radioactive Decay - Radioactive Growth and Decay - Ideal Equilibrium - Transient Equilibrium and Secular Equilibrium - Radioactive Series - Radioactive Isotopes of Lighter Elements - Artificial Radioactivity - Determination of the age of the Earth - Carbon Dating- Archeological Time Scale **3: The Q Equation** - Introduction - Types of Nuclear Reactions - Balance of Mass and Energy in Nuclear Reactions - The Q Equation - Solution of Q Equation - Centre of Mass Frame in Nuclear Physics	12	26.68%	CO5 CO6

SuggestedDistributionof TheoryMarksUsingBloom'sTaxonomy						
Level	Remembrance	Understanding	Application	Analyze	Evaluate	Create
Weightage	-	50	50	-	-	-

NOTE: This specification table shall be treated as a general guide line for the students and the teachers. The actual distribution of marks in the question paper may vary slightly from above table.

DocumentVersion:1.0

Suggested List of Experiments/Tutorials

Sr. No.	Name of Experiment/Tutorial	Teaching Hours
1	Optical Lever To determine the flatness and refractive index of glass plate and radius of curvature of lenses by optical lever	02
2	Newton's Ring To find the wave length of light of given monochromatic source	02
3	Refractive Index of Liquid using Convex Lens	02
4	Activation energy of a semiconductor.	02
5	Analysis of Errors	02
6	Deflection Magnetometer to determine the Ratio (M/H) for given bar magnate using deflection magnetometer in Gauss A and B position.	02
7	Stefan Constant To verify the Stefan Boltzman's fourth power law by using dc power source	02
8	Half-Wave & Full-wave Rectifier Obtain load characteristic.	02
9	Determine ripple factor for Full wave rectifier without filter only.	02
10	Bridge Rectifier Obtain load characteristic and regulation for Bridge rectifier without using filter circuit.	02
11	Projection Method To find the value of low resistance by the method of projection of potential.	02
12	Maxwell's Bridge To find the value of an inductance of an unknown inductor by using Owens's bridge circuit.	02
13	Owens's Bridge To find the value of an inductance of an unknown inductor by using Owens's bridge circuit.	02
14	Universal Logic Gates NAND (using discrete components) Verification of truth tables and giving understanding of voltage level for '0'and '1'level.	02
15	LDR Characteristics Obtain IV characteristics of given LDR.	02
16	Calculate LDR resistance (for at least three different light levels).	02
17	Draw the Owens's bridge circuit.	02
18	%regulation for Full-wave rectifier with-out filters circuit and by using capacitor filters circuit.	02
19	Universal Logic Gates NOR (using discrete components) Verification of truth tables and giving understanding of voltage level for '0'and '1'level.	02
20	Using capacitor filter circuit. Obtain ripple factor without filter circuit.	02
21	To determine the frequency of unknown fork	02
22	Logic Gates (AND, OR, NOT) (Using discrete components) Verification of truth tables and giving understanding of voltage level for '0'and '1'level.	02

Major Equipment/Instruments and Software required

Sr.No.	Name of Major Equipment/ Instruments and Software
1	Capacitors
2	Owens's bridge circuit
3	Convex Lens

Suggested Learning Websites

Sr. No.	Name of Website
1	http://nptel.ac.in/courses/115103101
2	http://nptel.ac.in/courses/115107131

Reference Books

Sr.No.	Name of Reference Books
1	Nuclear Physics by Irving Kaplan, Narosa Publishing House
2	Mechanics by H S Hans & S P Puri. (Tata McGraw Hill Education Private Limited
3	Principles of Physics by Halliday, Resnick, Jearl Walker (9th Addition) Wiley India Pvt. Ltd.
4	University Physics by Hugh D. Young, Roger A. Freedman, A. Lewis Ford (Pearson)
5	Mechanics and Electrodynamics by Brijlal, N. Subramanyam, Jeevan Seshan (S.Chand)
6	Physics Galaxy (Vol. I to IV) by Ashish Arora. (G. K. Publications)
7	A Manual Of Radioactivity by Havest and F. A. Paneth, Oxford University Press
8	An introduction to LASERS – Theory and Applications by M.N.Avadhanulu, S.Chand& Company Ltd.
9	Element of plasma physics, By - S.N.Goswami Pub.- New Central Book Agency (p) Ltd. Culcutta, India.
10	Introduction to Classical Mechanics by R. G. Takwalw and P. S. Puranik (Tata McGrawHill Pub. Com. Ltd.)
11	Modern Electronic Instrumentation and Measurement Techniques by Albert D. Helfrick, William D. Cooper published by PHI Learning private Ltd., New Delhi,
12	Fundamentals of Electricity and Magnetism by R.B.Singh&A.K.Shukla (New Age International Publishers)
13	Mechanics, Wavemotion& Heat By - Francis Wetson Sears Pub.- Addision Wesley pub.