DEPARTMENT PHYSICS

Programme Specific Outcomes

AIMS AND OBJECTIVES OF B.Sc. PHYSICS

The Department of Physics recognizes that curriculum, course content and assessment of scholastic achievement play complementary roles in shaping education. The department is of the view that assessment should support and encourage the goals such as basic knowledge of the discipline of Physics including phenomenology, theories and techniques, concepts and general principles. This should also support the ability to ask physical questions and to obtain solutions to physical questions by use of qualitative and quantitative reasoning and by experimental investigation. The important student attributes including appreciation of the physical world and the discipline of Physics, curiosity, creativity and reasoned skepticism and understanding links of Physics to other disciplines and to societal issues should gave encouragement. With this in mind, we aim to provide a firm foundation in every aspect of Physics and to explain a broad spectrum of modern trends in physics and to develop experimental, computational and mathematical skills of students. The programme also aims to develop the following abilities:

PSO1: Read, understand and interpret physical information – verbal, mathematical and graphical.

PSO2: Equip students in methodology related to Physics.

PSO3: Impart skills required to gather information from resources and use them.

PSO4: To give need based education in physics of the highest quality at the undergraduate level.

PSO5: Perform experiments and interpret the results of observation, including making an assessment of experimental uncertainties.

PSO6: Provide an intellectually stimulating environment to develop skills and enthusiasms of students to the best of their potential.

PSO7: Use Information Communication Technology to gather knowledge at will.

PSO8: Attract outstanding students from all backgrounds.

DEPARTMENT OF PHYSICS

COURSE OUTCOMES

B. Sc. I, Semester I

Physics Paper I: DSC 1 A: Mechanics I

After completing this course student will able to

CO1: Understand and recognize scalar and vector physical quantities.

CO2: Understand and able to apply the ordinary differential equations to physical Problems

CO3: Understand the Newton's laws of motion.

CO4: Understand the conservation of momentum and energy and related physical phenomenon.

CO5: Understand the rotational motion, moment of inertia and able to determine the M. I. of various systems in rotational motion.

Physics Paper II: DSC 2 A: Mechanics II

After completing this course student will able to

CO 1: Apply gravitational laws to a physical problem

CO2: recognize simple harmonic motions in nature and solve their equations

CO3: Understand Properties of matter (e.g. elasticity and surface tension) and apply this knowledge to physical problem.

B. Sc. I, Semester II

Physics paper III DSC B: Electricity and Magnetism I

CO1: Prove and apply Gauss, Stokes and Greens theorems

CO2: understand electrostatic field and potential and determine the same for different physical bodies.

CO3: Capacitor and its types

CO4: Energy in electrostatic field.

Physics Paper IV DSC 2B: Electricity and Magnetism II

After completing this course student will

CO1: Solve and build desired A. C. circuits

CO2: Get knowledge of magnetic effect of electric current and different magnetic materials

CO3: Understand how different energies will covert in to electrical energy using magnetic field

CO4: Able to understand Maxwell's equations and its applications.

B. Sc. II, Semester III

Physics Paper V: DSC – C1 Thermal Physics and Statistical Mechanics - I

After completing this course student will

CO1: Understand kinetic interpretation of temperature, Andrew's Expt. and different types of thermometers

CO2: Understand kinetic theory of gases and concept of Transport phenomena.

CO3: Understand thermo-dynamical state, thermodynamic equilibrium, various thermodynamic processes and first law of thermodynamics.

CO4: Understand second and third laws of thermodynamics, Carnot's theorem, working of Carnot's engine, Otto engine and diesel engine and concept of entropy.

Physics Paper VI: DSC – C2 Waves and Optics - I

This course will enable Students to:

CO1: Understand SHM and its solution, superposition principle and Lissajous figures and their uses.

CO2: Understand travelling and standing waves on a string, plane waves and spherical waves.

CO3: Understand define transducers and their types, to understand concept of acoustics of buildings, Sabine's experimental work and reverberation time.

CO4: Understand the Piezo-electric effect, detection of Ultrasonic waves and applications of ultrasonic waves.

B. Sc. II, Semester VII

Paper VII: DSC – C1 Thermal Physics and Statistical Mechanics - II

This course will enable Students to:

CO1: To Learn measuring skills in practical.

CO2: understand the wave particle duality and its quantum mechanics.

CO3: To understand the length of vibrating air columns, Resonance and can measure velocity of sound.

CO4: To determine thermal conductivity, temperature coefficient of resistance, thermo-emf and specific heat.

B. Sc. II, Semester IV:

Paper VII : DSC – C2 Waves and Optics - II

This course will enable Students to:

CO1: To understand various thermo dynamical functions, Maxwell's Relations, Joule – Thompson effect and Clausius- Claperyon Equation.

CO2: To understand Black body radiation, Planck's law, Rayleigh-Jean's law, Stefan Boltzmann law and Wien's displacement law.

CO3: To understand Phase Space, Macrostate, Microstate, Ensembles, Priori Probability.

CO4: To understand thermodynamic Probability and Maxwell Boltzmann Distribution law.

B. Sc. III Semester V

PAPER IX: MATHEMATICAL & STATISTICAL PHYSICS

CO 1: Students have understood micro and macro canonical ensembles, phase space, state.

CO 2: Students can easily distinguish between Mathematical & Statistical Physics.

CO 3: Improve the mathematical skills to solve to problems in physics.

CO4: Students have understand different types of differential equations & their solutions.

PAPER X: QUANTUM MECHANICS

CO 1: Students understand the idea of wave function & uncertainty relations.

CO 2: Students clear the some concepts of physics by quantum mechanics.

CO 3: Students solve problems on barrier potential well, one and three dimensional potential well

CO 4: To understand the Schrodinger's equation for hydrogen atom.

PAPER XI: CLASSICAL MECHANICS

CO 1: Students are able to understand the concept of force, constraints, Newton's laws of motions.

CO 2: Formulation of Langrangian equation of motion and solution of problems.

CO 3: Understand the difference between Classical & Quantum Mechanics.

CO 4: Students are able to understand Euler's Theorem and its equation of motion.

PAPER XII: ATOMIC, MOLECULAR SPECTRA & ASTRONOMY AND ASTROPHYSICS

CO 1: Develop a basic understanding of physics of atoms and molecules: definitions, units, laws and rules.

CO 2: Identify atomic effect such as Zeeman effect, Paschen-Back effect and Raman effect.

CO 3: Understanding of basic concepts of Astronomy & Astrophysics

CO 4: Analyze the spectra of diatomic molecules such as electronic, rotational, Vibration spectra.

B. SC. III SEM VI

PAPER XIII: NUCLEAR AND PARTICLE PHYSICS

CO 1: Students are able to understand the size of nucleus and all its properties.

CO 2: Students know various method of accelerating various types of particles.

CO 3: Understanding the construction & working of Nuclear Detectors.

CO 4: Students are able to understand the different Nuclear Energy Levels.

PAPER XV: ELECTRODYNAMICS & ELECTROMAGNETIC WAVES

CO 1: Students know the basic concepts about Electrodynamics & Electromagnetic waves.

CO 2: Students are able to understand concept of Poission's & Laplace's equations and its Solutions.

CO 3:Understanding the various laws like Faraday's Law, Lenz's Law and Biot Savarot's Law.

CO 4: Students learn the basic Maxwell's equation and its physical significance.

Paper XIV: Energy studies and Material Science

After completing this course student will able to

CO1: understand basics of renewable energy sources

CO2: Understand Physics and mathematics of wind turbine generator.

CO3: Understand conversion of solar energy into electric energy, photovoltaic cell, solar PV system and solar potentials.

CO4: understand different types of disorder in the crystalline solids and it's important.

CO5: gain basic knowledge of superconductivity.

Paper XVI: Solid State Physics

After completing this course student will able to

CO1: develop a clear concept of the crystal classes and symmetries

CO2: understand the relationship between the real and reciprocal space

CO3: calculate the Braggs conditions for X-ray diffraction in crystals

CO4: create understanding of electronic and vibrational properties of solid state systems

CO5: Understand Band theory of solids and use in different physical phenomenon.

CO6: Understand construction, working and applications of IC

Shri Vijaysinha Yadav Arts and Science College, Peth Vadgaon

Dept. of Zoology

Programme Specific Outcome

Sr. No.	Programme Specific Outcome
PSO 1	Acquisition of knowledge of animal science to the pupils
PSO 2	Acquisition of the knowledge of nutrition, agriculture & live stock in their daily life
PSO 3	Awareness of natural resources and environment
PSO 4	Aptitude for scientific work & ability to pursue studies far beyond graduation
PSO 5	Life science as a career, which is the need now-a-day
PSO 6	Applications of scientific principles for organization of scientific exhibitions and competitions
PSO 7	Presentation skills and confidence in students
PSO 8	Skills in practical work, experiments, laboratory materials & handling of instruments
PSO 9	Interests in the subject
PSO 10	Enhancement of scientific attitude & scientific hobbies
PSO 11	Abilities to apply scientific methods, collection of scientific data, problem solving, Research Paper Writing, etc
PSO 12	Appreciation of the subject, contributions of scientists, scientific methods, scientific programs, etc

Course Outcome

Sr. No.	Class	Paper No.	Title of the Paper	Course Outcome
1	B. Sc. I	I	DSC 15A Animal Diversity I	1. Aptitude for identification of Animals as per Scientific Classification. 2. Acquisition of knowledge of anatomy and histology of different animals from various groups of Kingdom Animalia
2		II	DSC 16A Animal Physiology	1. Acquisition of knowledge of basic physiology and its relation to daily life. 2. Aptitude for identification of alteration in physiological processes by knowing symptoms of various diseases.
3		III	DSC 15B Cell Biology and Evolutionary Biology	1. Inculcation of Knowledge of Cell as well as structure and function of its organelles. 2. Understanding various evolutionary theories and its relevance with present evidences.
4		IV	DSC 16B Genetics	1. Inculcation of Knowledge of Genetics to solve criminal cases like pedigree analysis.
5	B. Sc. II	V	DSC 15C Animal Diversity II	1. Aptitude for identification of Animals as per Scientific Classification. 2. Acquisition of knowledge of anatomy and histology of different animals from various groups of Kingdom Animalia
6		VI	DSC 16C Biochemistry	1. Acquisition of knowledge of Biomolecules and their chemical processes.
7		VII	DSC 15D Reproductive Biology	1. Acquisition of knowledge of anatomy and histology of reproductive organs in human being. 2. Acquisition of knowledge of process of reproduction and its hormonal control in human being. 3. Inculcation of Knowledge of assistive reproductive technology for human being.
8		VIII	DSC 16D Applied Zoology I	1. Aptitude for identification of some pathogenic diseases and their control measures. 2. Acquisition of knowledge of host parasite

				relationship and its use in human welfare 3. Aptitude for application of modern technologies in poultry management and its use for human welfare.
9	B. Sc. III	IX	Functional Anatomy of Non-chordates	1. Acquisition of knowledge of anatomy and histology of different animals from Non chordates. 2. Aptitude for various aspects of Functional Anatomy of Non-chordates
10		X	Biostatistics, Bioinformatics and Medical Zoology	1. Acquisition of knowledge of Biostatics for research. 2. Acquisition of knowledge of Bioinformatics for research. 3. Acquisition of knowledge of various pathogens, vectors, symptoms of diseases and preventive measures to avoid such diseases.
11		XI	Molecular Biology, Biotechnology and Biotechniques	1. Aptitude for various processes of Nucleic acids and their role in cellular mechanism. 2. Acquisition of knowledge of molecular modeling and their use to improve quality of human life. 3. Aptitude for use of various scientific instruments for molecular modeling.
12		XII	Endocrinology, Environmental Biology and Toxicology	1. Inculcate the knowledge of hormones and hormone related diseases. 2. Acquisition of knowledge of environmental factors for protection and conservation of environment. 3. Aptitude for identification of adverse effects of chemical substances on living organisms.
13		XIII	Comparative Anatomy of Vertebrates	1. Acquisition of knowledge of vertebrate anatomy to compare and decide evolutionary relationship.
14		XIV	Developmental Biology	1. Acquisition of knowledge of developmental patterns of different economical and research important animals
15		XV	Physiology	1. Aptitude for identification of alteration in physiological processes by knowing symptoms of various diseases.
16		XVI	Applied Zoology	1. Social and Economical growth of individual by applying knowledge of Applied Zoology.

Department of Geography

COURSE OUTCOMES (CO)

B. A. Part - I (Paper No. I & II)

1) Students should know the fundamental branches of Geography in general and Geomorphology and Climatology in particular.
2) Students should get acquainted with the Geomorphological and Climatological concepts.
3) Students should know the basis of Human development by studying these Physical branches of Geography.

B. A. Part - II (Paper No. III to VI)

I) Soil Geography (Paper No. III)

1) Students should know soil geography is the fundamental branch of Physical Geography.
2) To familiarize the students with the basic and fundamental concepts of soil geography.
3) With this study, students understand soil is key resource for the development of any country.
4) Students should know that concept, causes and controlling factors soil erosion, soil degradation and Conservation of Soils.
5) Students should know the concept, need and methods soil of management.
6) Students should know classification, characteristics and distribution of soils.

II) Resource Geography (Paper No. IV)

1) To understand the concept and classification of resources in the world.
2) To get information about the major resources (water, forest, energy and human)
3) Students should know the sustainable development of resources.
4) To make students aware about the cartographic techniques.

III) Oceanography (Paper No. V)

1) Students should know oceanography is the fundamental branch of Physical Geography.

2) To familiarize the students with the basic and fundamental concepts of oceanography.
3) With this study, students understand marine is key resource for the development of any country.
4) Students should know physical and chemical properties of oceans.
5) Students should know types of oceanic currents and currents of Atlantic, Pacific and Indian oceans.
6) Students should know hypsographic curve, wind rose, iso-salinity lines and isotherms.

IV) Agricultural Geography (Paper No. VI)

1) To understand the concept and development of Agriculture.
2) To examine the role of agricultural determinants towards the changing cropping pattern.
3) To study the Green Revolution.
4) The course also aims to familiarize the students with the Agricultural concepts and modern technologies used in Agriculture.

Inter Disciplinary Subject

I) Concepts in Tourism Geography and Development and Planning of Tourism (Paper No. I & II)

1) To familiarize the students with aspects of tourism which have a relation with the subject matter of Geography
2) To orient the students to the logistics of tourism industry and the role of tourism in regional development.
3) To understand the impact of tourism on physical and human environments.
4) To familiarize the students with local, regional and national tourism.

B. A. Part –III (Paper No. VII to XIV)

I) Evolution of Geographical Thought (Paper No. VII)

1) Students should be able to understand in-depth about the evolution of the Geographical thought.
2) Students should be able to analyse the recent trends in Geography.

3) Students should be able to make use of various models of paradigms and debates in the Geographical studies.
4) Understanding of recent trends in Geography.

II) Geography of India (Paper No. VIII)

1) In-depth understanding the dimensions and physiography of India.
2) The students are fully aware about the climatic seasons in India.
3) Detailed knowledge about soil, vegetation and drainage system in India.
4) Understanding and importance of agriculture and Industry in Indian economy.
5) Detailed knowledge about the economic steps of India.

III) Population Geography (Paper No. IX)

1) This paper would bring an understanding of population Geography along with relevance of demographic data.
2) The students would get an understanding of distribution and trends of population growth in the developed and less developed countries along with population concepts.
3) The students would get an understanding of the dynamics of population.
4) An understanding of the implications of population composition in different regions of the world.
5) An appreciation of the contemporary issues in the field of population studies.

IV) Economic Geography (Paper No. X)

1) In-depth understanding about the Economic Geography.
2) Detailed knowledge about locational factors of economic activities with special references to agriculture and industry.
3) Detailed understanding of the basic concepts related to manufacturing industries (selected countries) of the world.
4) Understanding of the transport and trade.

V) Urban Geography (Paper No. XI)

1) The students were known the importance of Urban settlement through Urban Geography.
2) The students understood the types of urban settlement site and situation.

3) The students were familiar with an idea of relationship between human activities and urban development.
4) Detail understanding of students regarding present urban problems and students are capable to handling of present problematic situations in urban areas.
5) The students are developed as a good urban planner and environmental conservator.

VI) Geography of Health and Wellbeing (Paper No. XII)

1) Understand various geographical perspectives related to human health.
2) Create awareness of human health and environmental trends.
3) The students are familiar with geographical background of diseases and their regional pattern.
4) Detail understanding of pressure on environmental quality and human health.
5) Create awareness among the students of malnutrition and hygiene.
6) The students are familiar with the process of health care planning in India.
7) The students are aware about impact of climate change on human health.

Practical Papers:

VII) Fundamentals of Map Making and Map Interpretation (Paper No. XIII)

1) In depth understanding the map, concept of scale and projection.
2) Detailed knowledge about the analysis of landforms and its identification.
3) The students are deeply aware about basic information to the students about S.O.I. topomaps and I.M.D. weather maps and obtained the skills about map interpretation.
4) The students are deeply familiar with different cartographic techniques and methods used for representation of demographic and physio- socio-economic database

VIII) Advanced Tools, Techniques & Field Work in Geography (Paper No. XIV)

1) In depth understanding the importance of field work and advanced Techniques in Geography.

2) The students are trained to implement modern tool and techniques in Geography.
3) Detailed knowledge about the use of computer for analysis of Geographical data.
4) The students are deeply aware about the basics and trained in instrumental survey.
5) The students are deeply familiar with computer, GIS, GPS and Remote Sensing.

B. Sc. Part – I (Paper No. I to IV)

1) To introduce the latest basic concepts in Physical Geography, Specifically in Geomorphology, Climatology and Oceanography.
2) To get aware about the concepts in Human Geography i.e. Human races, population growth, distribution, migration, sex ratio, age structure, rural and urban settlements.
3) To understand about the growth and development of towns and cities with the help of theories.

PROGRAMME SPECIFIC OUTCOME (PSO)

1) The Students are known the Human development by studying these Physical branches of Geography.
2) The students are understood the branches of Geography, concepts in Physical Geography and Geomorphology and Climatology in detail.
3) The students are acquired knowledge about the basic and fundamental concepts of soil geography.
4) The students are understood soil is key resource for the development of any country with concept, causes and controlling factors of soil erosion, soil degradation and Conservation of Soils. Along with the concept, need and methods soil of management.
5) Students are known classification, characteristics and distribution of soils.
6) The students are understood the Human Geography as a basic branch of Geography along with the Dichotomy, Environmentalism and possibilism.
7) The students are well prepared with the knowledge of the racial groups in the world, man- environment conflict and Ecological crises. They are familiar about the World population growth, distribution and the population policies.
8) The students are familiar with the fundamental concepts of oceanography, they are also known oceans are the best alternative source to the earth resources.
9) Students are talented about physical and chemical properties of oceans and get detailed about types of oceanic currents and currents of Atlantic, Pacific and Indian oceans.
10) The students are individually ready to prepare graphs and diagrams of oceanic statistical data.
11) The students are well acquainted with new emerging concepts and development of Agriculture. They are aware about agricultural determinants towards the changing cropping pattern and Green Revolution.
12) They are aware about the Agricultural concepts and modern technologies used in Agriculture.

13) The students are familiar with aspects of tourism which have a relation with the subject matter of Geography and students are oriented in relation to the logistics of tourism industry and the role of tourism in regional development.
14) The students are individually examining an impact of tourism on physical and human environments.
15) The students are acquainted with distinct dimensions, physical setup, climate and mechanism of monsoon, soils and vegetation of India.
16) Regional study of India helps the students to understand recent trends in regional study.
17) The students have known an importance of research, principles, techniques of research and methodology.
18) The students are understood the process and value of geographical research and also they are able to apply skills and ICT in geography.
19) The students are well acquainted with the relationship of human activities with resources at global level.
20) The students are able to apply global economic situation at local level.
21) The students are acquainted about regional resources.
22) The students well familiar with different agricultural products, means of transportation and their network of the India.
23) The students are got the knowledge of transport and trade in India.
24) The students are aware about fundamental concepts of Urban Geography and types of Urban Settlements, site & Situation.
25) The students are capable up to some level for handling the present problematic situation in urban and rural areas.
26) The course matter of Urban Geography has been prepared the students for good planner and environmental Conservator.
27) The students are able with distinct dimensions of Political Geography.
28) The students are known the role of geographical factors in influencing the political character of countries / regions.
29) The students are understood the geo-political issues in India and World.

30) The students are understood with the importance of map making & map Interpretation.
31) The students are understood map, concept of projection and concept of scale.
32) The students are trained in analysis of landforms, map Interpretation (S.O.I. topomaps and I.M.D. maps).
33) The students are trained in applications of different cartographic techniques and methods used for representation of demographic and physio- socio-economic database.
34) The students are aware about the applications of modern tool & techniques in Geography.
35) The students are developed their skills in instrumental (Plain Table and Prismatic Compass) survey.
36) The students are able to use computer for analysis of Geographical data.
37) The students are understood the basic information about Arial Photographs, Remote Sensing, GIS and GPS.