



J.B.S.P. Mandal's
Arts & Science College, Chaklamba

Programme Outcomes

Programme Outcomes

Sr No	Programme	Page No
1	B.A.	2
2	B.Sc.	3

BA
Bachelor of Arts

Programme Outcomes		
PO 1	Social responsibility and awareness	Acquire knowledge in social sciences, literature and humanities which make them sensitive, helping them to grow their ability as responsible citizens.
PO 2	Inculcation of human values	Train students to discern ethical principles and personal values in light of academic experience to deal various problems in life with courage and Humanity.
PO 3	Social and economic issues	Learners get familiarize with the social, economic, historical, geographical, political, ideological and philosophical tradition and thinking.
PO 4	Communication skills	Acquire communication skills, interpersonal and soft Skills.
PO 5	Competency	Instil professional competencies and values in the graduates to appear for various competitive examinations or post graduate programmes.
PO 6	Creativity:	Acquire sense of social service and creative ability.



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Arts & Science College,
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B.Sc.
Bachelor of Science

Programme Outcomes		
PO 1	Scientific temperament	Instill scientific attitude in the minds of learners and acquire scientific abilities like logical thinking, problem solving approach, data collection and Decision making.
PO 2	Basic scientific knowledge	Acquire scientific knowledge to extract information, formulate and solve problems. Employ critical thinking to design, carry out, record and analyze the results
PO 3	Technical competence and practical skills	Acquire skills and advanced techniques to handle basic scientific instruments following the general lab safety practices through experimental skills
PO 4	Creative thinking and numerical ability	Empower the learners with creative thinking and numerical ability.
PO 5	Environment and sustainability	Provide understanding of current environmental Scenario and necessity of sustainability along with solutions.
PO 6	Competency	Instill professional competencies and values in the graduates to appear for various competitive Examinations or post graduate programs.




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J.B.S.P. Mandal's
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Course Outcomes

J.B.S.P. Mandal's

Arts & Science College, Chaklamba

Department of Geography
Course Outcomes

B.A First Year I & II Semester

Paper I : Elements of Physical Geography

Co1	Describing human-environment, and nature-society
Co2	Interactions as well as global human and environmental issues.
Co3	Identifying and explaining the planet's human and physical characteristics and processes, from global to local scales.
Co4	Evaluating the impacts of human activities on natural environments.
Co5	Applying knowledge of global issues to local circumstances to evaluate the local effects of the issues.
Co6	Showing an awareness and responsibility for the environment

Paper II: Human Geography

Co1	You have in-depth knowledge of the history of human geographic thought.
Co2	You have advanced empirical and theoretical knowledge within one or more of the following areas:
Co3	Urban Studies and Planning, Climate Change Adaptation and Social Transformations,
Co4	You have in-depth knowledge of advanced methodological tools
Co5	Development and Politics, and Economic Of Human Geography.
Co6	And can assess their appropriate use for the analysis of specific issues.

Paper III : Geography Landform

Co1	Understand earth's tectonic and structural evolution. Gain knowledge about earth's interior. Develop an idea about concept of plate tectonics, and resultant
Co2	Understand the theories and fundamental concepts of Geotectonic and Geomorphology.
Co3	Acquire knowledge about types of folds and faults and earthquakes, volcanoes and associated landforms.
Co4	Understanding crustal mobility and tectonics; with special emphasis on their role in landform development.
Co5	Development models. ability to record temperature, pressure, humidity and rainfall

Co6	Overview and critical appraisal of landform Develop the skills of identification of features and correlation between them.
Paper IV : Regional geography of Maharashtra	
Co1	To acquaint the students with geography of our state.
Co2	To make the student aware of the magnitude of problems
Co3	Prospects at State level.
Co4	III. To help the students to understand the inter relationship between the subject and the society.
Co5	To help the students to understand the recent trends in regional studies.
Co6	Comparison of our state & other state
Paper V : Practical Geography	
Co1	Understand the Nature and Development of Cartography
Co2	Able to prepare maps with their basic elements.
Co3	Identification of different scale types.
Co4	Identification varies graphs. Enlargement & reduction of map.
Co5	Representation of slopes & land forms.
Co6	Identification toposheet & Symbol.
B.A Second Year III & IV Semester	
Paper VI : Climatology	
Co1	Understand the elements of weather and climate, different atmospheric phenomena and climate change.. Learn.
Co2	Learn to associate climate with other environmental and human issues. Approaches to climate classification.
Co3	To analyze the dynamics of the Earth's atmosphere and global climate. Assessing the role of man in global climate change
Co4	Prepare various climatic maps and charts and interpret them. Learn to use of various meteorological instruments.
Co5	the interaction between the atmosphere and the earth's surface. Understand the importance of the atmospheric pressure and winds
Co6	Understand how atmospheric moisture works.
Paper VII : Population Geography	
Co1	To understand the clear concepts of population geography, through spatial and temporal frameworks; population dynamics;
Co2	Demographic studies of population geography •
Co3	World population and development with special reference to India.
Co4	To understanding of nature, scope and evolution of population geography

Co5	Acquiring, handling and analyzing population data both at the grassroots level and secondary sources
Co6	To understand of settlement, concepts associated with Population theories and different growth and morphology
Paper VIII: Oceanography	
Co1	Analyse the concepts of Hydrology and Oceanography
Co2	Emphasizing the significance of groundwater quality and its circulation
Co3	Evaluate the role of the global hydrological cycle.
Co4	Realize the importance of water conservation. Identify marine resources and characteristics of ocean waters.
Co5	Interpret hydrological and rainfall dispersion graphs and diagrams.
Co6	Studying the behaviour and characteristics of the global oceans.
Paper IX: Settlement Geography	
Co1	Acquire knowledge about Rural settlements- Definition, nature and characteristics Differentiate between city-region and conurbation topographical sheet
Co2	Analyse the morphology of rural settlements Learn the rural house types, census categories of rural settlements and idea of social segregation
Co3	Learn the census definition and categories of urban settlements Analyse the urban morphology models of Burgess, Hoyt, Harris and Ullman
Co4	Analyse the functional classification of cities Develop the skill of mapping language distribution of India
Co5	Learn to plot proportional squares to illustrate housing distribution Acquire the skill of identifying rural settlement types from
Co6	Understand Social Area Analysis of a city based on Shaky and Bell
Paper X : Practical Geography	
Co1	Understand the basic principles of Weather Interpretation
Co2	Acquire knowledge about the uses of Meteorological instruments
Co3	Interpretation of Weather maps
Co4	Interpretation of whether interment
Co5	Understand conventional signs & symbol
Co6	Understand the map projection
B.A Third Year V & VI Semester	
Paper XI : Physical Geography Of India	

Co1	Identifying and explaining the Indian Geographical Environment, from global to local scales.
Co2	Applying geographical knowledge to everyday living.
Co3	Applying knowledge of global issues to a unique scientific problem.
Co4	Showing an awareness and responsibility for the environment and India.
Co5	Evaluating the impacts of human activities
Co6	Natural environments special reference to India.
Paper XII : Geography Of Environment	
Co1	The students acquired the information about environment.
Co2	Acquired information about climate
Co3	Earth's and anthropogenic movement and environment changes.
Co4	The students improved their role in environment.
Co5	The students increased the knowledge in research.
Co6	To create awareness about environment in the society.
Paper XIII : Industrial Geography Of Maharashtra	
Co1	Study the different elements of Industrial geography of Maharashtra
Co2	Identify key about historical, Political background of Maharashtra
Co3	Describe the administrative divisions in details as well drainage system, climatic regions, drought prone regions, flood areas etc.
Co4	Details in Maharashtra's agricultural land, different crops processing Industries
Co5	Industrial area and their importance,
Co6	Role of population, settlements, Tourism and urbanization in Industry.
Paper XIV : Agriculture Geography of India	
Co1	Understand about the introduction to agriculture, nature, scope, significance and Development of agriculture geography, study approaches applied in agriculture.
Co2	Understand the influence of physical, Economic and Technological factors on agriculture patterns.
Co3	To understand the agricultural system its meaning and concept, whittlesey's classification
Co4	Agricultural system, types of agricultural, study the types of agricultural in respect of area, salient Features and their problems.

Co5	Understand the agricultural regionalization and modes in agricultural geography and their classification of agricultural models and some theories.
Co6	Understand definition and characteristics of arid and semi-arid regions and study about droughts and famines, role of irrigation and dry farming.
Paper XV : Geography Of Natural Calamity	
Co1	Understand the nature of hazards and disasters.
Co2	Assess risk, perception and vulnerability with respect to hazards.
Co3	Prepare hazard zone maps
Co4	Assessing the nature, impact
Co5	management of major natural and man-made hazards
Co6	Affecting the Indian subcontinent.
Paper XVI : Practical Geography	
Co1	Understand the collection Geographical data
Co2	Classification and processing of geographical data.
Co3	Comprehend the graphical representation and interpretation of the results
Co4	Apply basic statistical analysis to geographical data day-to-day uses
Co5	Conduct Plane table survey and Prismatic survey and produce the survey maps
Co6	Educational survey and agriculture survey data analyses
Paper XVII: Bio-Geography	
Co1	Understand the impact of man as an active agent of soil transformation, erosion and degradation Studies
Co2	Recognize land capability and classify it.
Co3	Processes of soil formation, types of soil, and principles of soil and land classification; and management.
Co4	Understand the varied ecosystems and classify them.
Co5	Recognize the significance of biogeochemical cycles and biodiversity.
Co6	Comprehend the devastating impact of deforestation. • Identify soil types and derive
Paper XVIII : Practical Geography	
Co1	To undertake survey exercises in a geographical area. •
Co2	Apply different cartographic techniques to map
Co3	Appreciate how projections are applied to prepare maps from the globe
Co4	Learning map projections is an integral part of map making and this paper

Co5	Enable the students to gain insight about various map projection techniques.
Co6	Apply the map projection to read map
Paper XIX Project Work	
Co1	Students will be able to state an original research question appropriate for geographic analysis.
Co2	Students will be able to state how a research project contributes to an existing body of geographic literature
Co3	Students will be able to design legitimate geographic methodology.
Co4	Students will be able to implement legitimate geographic methodology.
Co5	Students will be able to explain and assess the results of original geographic research.
Co6	Students will be able to communicate clearly and effectively in a written format.



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Arts & Science College, Chaklamba Department of

Physical Education

Course Outcomes

**B.A. First
Year
Semester I
& II**

Paper I – Philosophical, Sociological foundation and History of Physical Education

CO1	Introduction to the theoretical concept of philosophical and sociological foundation of physical education
CO2	To impart knowledge to students regarding the fundamentals of sociological foundation & history of physical education.

Paper II – Principal & Recent development of Physical Education

CO1	To Develop Student's physical competence, knowledge of safe movement, their ability to use these perform in a wide range of activities associated with the development of an active.
CO2	To Provide the positive values, attitudes and a good foundation for student's lifelong and life wide learning in physical education.

Paper III- Practical in physical Education

CO1	To prepare the students in competition of games.
CO2	Develop game skill & abilities.




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B.A. Second

YearSemester

III & IV

Paper V- Health Education & Recreation in physical Education and sports.

CO1	To aware about own health.
CO2	To acquire knowledge about the health education.
CO3	To develop the personality of students and their socialization through recreation in physical education.

Paper VI – Officiating, Coaching & Training Methods in Physical Education and sports

CO1	To Acquire knowledge through the officiating, coaching & training methods.
CO2	To know the different training methods of fitness.

Paper VII – Practical In Physical Education

CO1	To Prepare the students in companions of games.
CO2	Develop game Skill & Abilities.




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B.A. Third Year

Semester V & VI

Paper IX – Ancient & Modern History of Physical Education and sports

CO1	To Create the interest in Ancient & Modern History in Physical Education and sports.
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Paper X – Sports Psychology & Management in physical Education and sports

CO1	To Provide foundation for the basic principles of psychology in physical education
CO2	To train players how psychological principles can help them to face sports challenges.
CO3	To enable students to relate what they are learning in class to issue that they encounter in their stress, Health, personal relationships communication and self -esteem.

Paper XI– Organization, Administration & Supervision in Physical Education and sports Youth welfare and youth services.

CO1	To acquire deep knowledge or organization and administration in physical education.
CO2	To use this knowledge in sports competition.




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Paper XIII- Anatomy, Physiology and kinesiology of physical Education

CO1	To study anatomy, physiology and kinesiology in physical education.
CO2	To understand the anatomy, Physiology and kinesiology effects on physical education.

Paper XIV - Practical in Physical Education (Subsidiary)**Paper XV - Practical in Physical Education (Main)**

CO1	To prepare the students in competition of games.
CO2	Develop game skill & abilities
CO3	To Accumulate fitness development and co-ordination of body.




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J.B.S.P. Mandal's
Arts & Science College, Chaklamba
Department of Chemistry
Course Outcomes

B.Sc. First Year
Semester I & II

Paper No. I (Inorganic Chemistry)	
CO1	Predict atomic structure and explain various quantum numbers
CO2	Explain standardized names and symbols to represent atoms, molecules, ions and chemical reactions
CO3	Explain trends of periodic properties of elements in periodic table
CO4	Predict biological role of Alkali and Alkaline earth metals

Paper No. II (Organic Chemistry)	
CO1	Explain various effects, and properties of organic compounds, nature of bond
CO2	Discuss nature of bond breaking and mechanical phenomenon
CO3	Explain concept of isomerism and types of stereo chemical configuration
CO4	Discuss mechanistic pathways of simple organic reaction

Paper No. III (Lab Course-I)	
CO1	Prepare and standardize various solutions
CO2	Determine basicity of given organic acid
CO3	Determine viscosity of given liquid
CO4	Identify acidic and basic radicals in given mixture
CO5	Identify types of organic compounds by chemical analysis method

Paper No. IV (Physical Chemistry)	
CO1	Calculates Logarithmic relations, curve sketching, linear graphs and calculation of slopes, differentiation of functions like kx , e^x , x^n , $\sin x$, $\log x$; maxima and minima, partial differentiation
CO2	Explains about Gas Laws, Boyles Law, Charles Law, Grahams Law of diffusion, Avogadro's hypothesis, deviation from ideal behavior, van der Waals equation of state
CO3	Understand the term Catalysis: Definition, types, and characteristics of catalysis, homogeneous, heterogeneous catalysis - Enzyme catalysis and its application
CO4	Derived and solve the numerical problems based on zero order, first order, second order, Pseudo order, half-life
CO5	Illustrate the concept of Liquid State, Solid State, Types of solids, Amorphous, crystalline and difference between them, Miller Indices
CO6	Explains difference between solids, liquids and gases. Explains and derived Laws of crystallography
CO7	Understand the basic concept of colloids, classification of colloids, preparation and properties of sols, emulsions and gels and their general applications

Paper No. V (Inorganic Chemistry)	
CO1	Demonstrate preparation, physical and chemical properties, structural properties, Applications of various elements
CO2	Differentiate chemical bonding, hybridization and molecular geometry on the basis of VBT
CO3	Differentiate types of indicators and correlate with appropriate titration method
CO4	Explain various aspects of radioactivity

Paper No. VI (Lab Course-II)

CO1	Identify nature /functional group /Derivative /physical constant of different compound
CO2	Prepare phenol by bromination
CO3	Estimate basicity molecular weight for acid example Oxalic acid acetic acid
CO4	Identify types of organic compounds by chemical analysis method




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B.Sc. Second Year

Semester III & IV

Paper No. VII (Organic Chemistry)	
CO1	Explain different types of alcohol and its identification in simple organic compounds
CO2	Differentiate alcohol and phenols in simple and complex organic molecules
CO3	Explain the structure of carbonyl compounds and type of various name reaction involving carbonyl group
CO4	Analyze effect of substituent on acidity of carboxylic acid
CO5	Analyze effect of basicity in various simple hetero cycles

Paper No. VIII (Physical Chemistry)	
CO1	Distinguish isothermal, adiabatic, isochoric and other thermodynamic processes
CO2	Correlate law of mass action, equilibrium constant with free energy
CO3	Solve numerical problems related to efficiency, work done, heat change

Paper No. IX (Lab Course -III)	
CO1	Determine concentration values of sample solutions using instrumentation
CO2	Analyze quantitatively, specific elements by complex metrically and gravimetric methods
CO3	Determine critical solution temperatures of heterogeneous phases
CO4	Evaluate and interpret heat of neutralization reactions

Paper No. X (Inorganic Chemistry)

- CO1** Present in depth knowledge of abundance, position, preparation, properties and chemical behavior of various d and f block elements from the

	periodic table
CO2	Identify co-ordination compounds and its applications
CO3	Differentiate aqueous and non-aqueous solvents



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Paper No. XI (Physical Chemistry)

CO1	Explain different types of Conductometric titrations
CO2	Solve mathematical problems on electro-chemistry
CO3	Explain phase diagrams of one component systems
CO4	Explain phase diagrams of two component systems
CO5	Classify electrochemical and electrolytic cells

Paper No. XII (Lab Course-IV)

CO1	Determine the molar refractive index of given sample by refractometer
CO2	Prepare organic derivatives and determine physical constants
CO3	Estimate ester, amide and other organic molecule entities
CO4	Preparation of derivative of different compound
CO5	Organic estimation of nitro group by reduction
CO6	Estimate amide by hydrolysis




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B.Sc. Third Year Semester V & VI

Paper No. XIII (Physical Chemistry)	
CO1	Understands about Black body radiation, Planck's radiation law, photoelectric effect, physical interpretation of the wave function, postulates of quantum mechanics
CO2	Develops the idea of Spectroscopy. Basic features of different spectrometers
CO3	Know Photochemistry and explain Laws of photochemistry, Grothus-Drapperlaw, Stark-Einstein law. Qualitative description of fluorescence, phosphorescence, non-radioactive processes and Jablonski diagram
CO4	Explains Physical properties and molecular structure by Guoy balance method, Applications of optical activity, dipole moment and magnetic property for determination of structure of molecule
CO5	Explain the Nano-materials and Methods of Synthesis of High energy ball milling, PVD, CVD and Micro emulsion. Synthesis using micro-organisms and plant extract

Paper No. XIV (Organic Chemistry)	
CO1	Find out types of sets of protons in organic compound, their chemical shift value, Splitting Pattern and Coupling Constant
CO2	Solve simple NMR problems with given data
CO3	Classify various organometallic compounds, Synthesis of various organometallic compounds and their application in organic transformation
CO4	Identify and classify various active Methylene compounds and their application in Organic Synthesis

Paper No. XV (Lab Course -V)

CO1	Separate and identify organic components
CO2	Perform Semi-micro-Qualitative analysis of inorganic mixture
CO3	Study the gravimetric and volumetric analysis of ores and alloy
CO4	Analyze binary mixture with removal of barium and Nickel

Paper No. XVI (Inorganic Chemistry)


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CO1	Explain nature of metal-ligand bonding and illustrate splitting of d Orbitals
CO2	Demonstrate mechanism of sodium potassium cycle
CO3	Describe essential and trace elements and their role in biological system
CO4	Categorize chromatographic techniques with reference to adsorbents and other Components.

Paper No. XVII (Organic Chemistry)

CO1	Explain effect of Aromaticity on strength of basicity of heterocyclic compound
CO2	Classify carbohydrates and its utility in day-to-day life
CO3	Explain synthesis of paracetamol
CO4	Explain properties of good Drugs

Paper No. XVIII (Lab Course-VI)

CO1	Identify organic mixtures by chemical analysis method
CO2	Analyze inorganic radicals by chemical analysis method
CO3	Identify and separate given mixtures by gravimetric and volumetric method
CO4	Analyze percent composition of acid mixture by Conductometric method
CO5	Identify empirical formula by Potentiometric method

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Arts & Science College, Chaklamba

Department of Physics

Course Outcomes

B.Sc. First Year

Semester I

Paper I : Mechanics, Properties of Matter

CO1	Identify fundamental principles in mechanics.
CO2	Illustrate Newton's laws of gravitation and Kepler's laws of planetary motion. Explain viscosity of Fluid, law of energy conservation and applications of Bernoulli's theorems with examples.
CO3	Apply the physical principles of moment of inertia in terms of the mass Distribution from the rotational axis to various symmetrical bodies.
CO4	Analyze the properties and applications of elasticity with experiments.
CO5	Justify the quantitative problem-solving skills in all the topics covered.
CO6	Develop an intuition towards problems solving and design realistic applications in the physical world.

Paper II: Heat & Thermodynamics

CO1	Recall the concepts of Thermodynamics.
CO2	Discuss the behavior of real gases.
CO3	Compute the thermodynamic quantities associated with different types of Processes.
CO4	Explain the working of heat engine, different types of thermometers. Compare types of heat engines and their working; temperature scales.
CO5	Determine work done, efficiency of heat engines and coefficient of performance of refrigerators, temperatures using different scales and principles of thermometers.

Semester II

Paper IV: Geometrical and Physical Optics

CO1	Describe and determine concept of cardinal point and different eye pieces
CO2	Explain interference phenomenon of light and its relevant experiments
CO3	Explain concept of diffraction of light and grating d its related Experiments
CO4	Describe polarization of light and its related Experiments

Paper V: Electricity and Magnetism

CO1	Recall the concepts associated with stationary charges.
CO2	Discuss the atomic view of polarization of matter. Explain the correlation in Electricity and magnetism.
CO3	Compute the boundary conditions and calculate quantities like current, voltage, Power, phase, impedance, etc in DC and AC circuits.
CO4	Classify the phase relations in AC circuits.
CO5	Compare the growth and decay of current in DC circuits.
CO6	Write the phase relations between different parameters (like current, voltage, power and impedance) in simple electronic circuits comprising of resistors, inductors and capacitors.




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B.Sc. Second Year

Semester III

Paper VII: Mathematical Methods in Physics

CO1	Recall the knowledge of calculus, vectors, vector calculus.
CO2	Illustrate methods of solving partial differential equations with the examples of Important partial differential equations in Physics.
CO3	Apply the various methods for solving differential equations in various physical problems such as in quantum mechanics, which they will learn in future courses in detail.
CO4	Explain the Fourier analysis of periodic functions and reconstruct physical problems such as vibrating strings etc.
CO5	Determine transformation equations and construct various coordinate systems. Compare Cartesian, spherical and cylindrical coordinate systems.
CO6	Formulate the special functions, such as the Hermit polynomials, the Legendre polynomials and Bessel functions and their differential equations.

Paper VIII: Modern and Nuclear Physics

CO1	Explain Photoelectric Effect and its applications in various processes
CO2	Describe X- Ray radiation and its spectra
CO3	Explain theoretical aspect of Atomic mass, nuclear fission and Energy released in nucleus
CO4	Describe Particle accelerator, Cyclotron and Deuterons
CO5	Define and describe basic properties of the nucleus.
CO6	Explain the concept of radioactivity. Classify different radiation detectors and Nuclear models.
CO7	Solve problems related to nuclear and particle physics.
CO8	Explain nuclear reaction dynamics, nuclear reactors and accelerators.
CO9	Compare nuclear energy with other energy sources.
CO10	Specify applications of accelerators and detectors. Compile knowledge of elementary particles to understand nuclear phenomena.

Semester IV

Paper XI: General Electronics

CO1	Describe semiconductors, Zener diode, Transistor and give its application
CO2	Explain Amplifier, RC coupling and Transistor biasing and discuss its applications
CO3	Describe theoretical and practical aspects of Oscillator and Multi-vibrator
CO4	Elaborate modulation, FM Modulation and AM wave

Paper XII: Solid State Physics

CO1	List seven crystal systems.
CO2	Explain free electron theory and band theory.
CO3	Calculate lattice parameter from given XRD pattern.
CO4	Identify the structure of materials.
CO5	Evaluate the density of the state equation in 3D.
CO6	Specify the importance of magnetic materials.

B.Sc. Third Year

Semester V

Paper XV: Classical and Quantum Mechanics XV

C01	Describe methods of solving equations of motions.
C02	Explain the necessity of considering constraints.
C03	Apply different techniques to find solutions to problems in Mechanics.
C04	Compare and contrast Newtonian, Lagrangian and Hamiltonian approaches.
C05	Determine the constraint equations and decide the generalized coordinates to be used.
C06	Hypothesize rotating frames of references.
C07	Recall and explain the phenomena like black body radiation, photoelectric effect, Compton effect, diffraction of photons/electrons from one/two slits, pair production etc.
C08	Explain the quantum statistics and differentiate between classical and quantum Statistics.

Paper XVI : Classical Electrodynamics

C01	Define electric fields, electric potential, displacement vector, electric Polarization.
C02	Articulate concepts of evaluating electric fields due to line charge, surface charge and volume charge using Coulomb's law and Gauss's law. Explain mechanism of polarization in dielectrics.
C03	Demonstrate special techniques to calculate potential due to some charge distribution.
C04	Explain motion of charged particles in the electromagnetic field. Deduce Biot Savart's law from Ampere's law.
C05	Compare magnetic properties of material on the basis of total spin of electrons in atoms.
C06	Compile Maxwell's set of equations and develop electromagnetic plane wave equations.

Semester VI

Paper XIX: Atomic and Molecular Physics

C01	Recall and recognize the gradual development of the Atomic theory and Distinguish between various atomic models.
C02	Explain the effect of magnetic field on atomic spectra.
C03	Solve the problems in Atomic theory.
C04	Relate atomic theory to analyze spectra.
C05	Evaluate spectroscopic data to identify elements using atomic spectra.
C06	Develop mathematical treatment for the Bohr atom, Zeeman effect and Raman Spectra.

Paper XX: Non-conventional energy sources and Optical fiber

C01	Explain the concept of technologies of non-conventional sources of energy
C02	Describe various renewable energy technology
C03	Discuss non-conventional energy sources: Biomass, wind energy, tidal energy Ocean. geothermal energy and solar energy
C04	Elaborate the concept of solar energy and its applications in various fields
C05	Describe structures of optical fibers
C06	Describe fiber fabrication techniques and testing of optical fiber cables

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Arts & Science College, Chaklamba
Department of Botany
Course Outcomes
B.Sc. First Year

Diversity of Cryptogams-I

CO1: Introduction about basic plant group like Algae and Fungi.
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CO2: To equip the students with all life science fundamental practical skills.

CO3: Make aware about the economic and medicinal value of cryptogrammic plant.

Morphology of Angiosperms

CO1: Introduction about basic structure of plants.

CO2: To develop practical knowledge of Angiosperm plants

Diversity of Cryptogams-II

CO1: To understand the various category of plants with morphological features of Bryophytes and Peridophytes.
--

CO2: Analyze the peculiar characteristics features of plant groups in relation with its Internal characteristics.

CO3: Make aware of economic and medicinal value of cryptogrammic plant.
--

Histology, Anatomy and Embryology
--

CO1: To get detail knowledge of internal structure of plantparts

CO2: To use this knowledge in Wood Industry, Forensicscience.
--

CO3: To understand development of seed and seed certification.

B.Sc. Second Year

Taxonomy of Angiosperm

CO1: Familiarize with basic terminology, plant systematic and its different classification.

CO2: To identify Angiosperm plants and their use.

Plant Ecology

CO1: Knowledge of anatomical characterization of plant for the understanding ecological adaptation.

CO2: Study its eco-friendly conservation and sustainable utilization.

CO3: Students cop up with the ecosystem mechanism, analyzing plants ecosystem.

Gymnosperms and Utilization of plants

CO1: To make aware about the economic and medicinal value of Gymnosperms and Angiosperms.

CO2: To understand some important terminology in industrial economically important higher plant groups species.

Plant Physiology

CO1: To understand plant physiology, different life process, streams like Plantgenetics and Plant biotechnology.

CO2: To use the knowledge for advance study in plant sciences.

B.Sc. Third Year

Cell and Molecular Biology

CO1: To create the innovative approaches to aware the students in basic terminology of plant cell

CO2: To get the detailed knowledge of cell at molecular level.

CO3: To apply this information for development of humankind

Diversity of Angiosperms-I

CO1: Create awareness about the plant resources

CO2: To classify plants on the basis of various morphological aspects

CO3: Participate in laboratory experiments for understanding the basic principles of life sciences and helpful for gaining primary information.

Genetics and Biotechnology

CO1: To Study basic terms in Mendelian and Non mendelian genetics

CO2: To focus on Biotechnological importance for improvement and satisfaction of all need of human kinds

CO3: To give basic information regarding the plant biotechnology and its application in agriculture, Horticulture, medicinal and industrial crops.

Diversity of Angiosperms-II

CO1: To study its eco-friendly conservation and sustainable utilization of plants

CO2: Knowledge about flora in the area.



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Department of Zoology
Course Outcomes

First Year Semester I

Paper I : Protozoa to Annelida	
CO1	Identify animals by observation
CO2	Describe unique characters of Protozoa, Porifera, Coelenterate, Helminthes and Annelids
CO3	Explain life functions of Protozoa, Porifera, Coelenterate, Helminthes and Annelids
CO4	Describe ecological role of phylum Protozoa, Porifera, Coelenterate, Helminthes and Annelida
CO5	Identify diversity from Protozoa, Porifera, Coelenterate, Helminthes and Annelids

Paper II: Cell Biology	
CO1	Describe in detail the structure of cell
CO2	Describe function and the composition of the plasma membrane
CO3	Explain principles of the cell theory
CO4	Differentiate between prokaryotes and eukaryotes
CO5	Understand importance of the nucleus and its components

Semester II

Paper IV: Arthropoda to Echinodermata and Hemichordata

CO1	Identify animals by observation
CO2	Describe unique characters of Arthropods, Mollusks, Echinoderms & Hemichordates
CO3	Explain life functions of Arthropods, Mollusks, Echinoderms and Hemichordates
CO4	Explain ecological role of phylum from Arthropod to Hemichordata

Paper V: Genetics I

CO1	Describe chemical basis of heredity
CO2	Explain role of genetics in evolution
CO3	Evaluate conclusions that are based on genetic data
CO4	Find the results of genetic experimentation in animals

B.Sc II Year Semester III

Paper VII: Vertebrate Zoology

CO1	Describe unique characters of urochordates, cephalochordates and fishes
CO2	Recognize life functions of urochordates to fishes
CO3	Explain ecological role of different groups of chordates
CO4	Explain the diversity of chordates and describe unique characters of amphibians, reptiles, aves and mammals
CO5	Describe life functions of amphibians, reptiles, Aves and Mammals

Paper VIII: Genetics II

CO1	Explain in detail gene expression and its behavior in transformation
CO2	Describe the role of genetics in evolution
CO3	Evaluate conclusions that are based on genetic data in population genetics
CO4	Describe genetic diseases and disorders
CO5	Explain the techniques that are used in genetic engineering




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SEMESTER IV

Paper XI: Animal Physiology

CO1	Describe in detail the physiology at cellular and system levels
CO2	Explain the role of different bio-molecules
CO3	Explain how mammalian body get nutrition from different bio-molecules
CO4	Describe the functions of different systems
CO5	Describe the physiology of respiratory, renal, endocrine and reproductive systems to define normal and abnormal functions

Paper XII: Biochemistry and Endocrinology

CO1	Describe in detail the metabolism of carbohydrates, proteins, fats
CO2	Explain the fundamental biochemical principles
CO3	Describe basic laboratory techniques in biochemistry
CO4	Describe the structure and function of endocrine glands
CO5	Explain the role of hormones




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B.Sc III Year

Semester V

Paper XV: Ecology

CO1	Describe abiotic and biotic factors that affect, the distribution, dispersal, and behavior of organisms
CO2	Identify factors that affect biological diversity and the functioning of ecological systems
CO3	Use an ecological vocabulary in arguments and explanations of ecological phenomena
CO4	Apply concepts and theories from biology to ecological examples
CO5	Analyze and interpret ecological information, research and data

Paper XVI (D): Parasitic protozoa & Helminthes I

CO1	Study of life cycles of Protozoan parasitic disease, its control, treatment and prophylaxis
CO2	Explain the methods used for diagnosis and treatment of Helminthes diseases.
CO3	Distinguish the methods used for protection of parasitic infectious diseases.

Semester VI

Paper XIX: Evolution

CO1	Describe evolutionary history of man
CO2	Describe origin of species on earth
CO3	Have an enhanced knowledge and appreciation of evolutionary biology and behavior
CO4	Perform, analyze and report on experiments and observations in whole-organism biology
CO5	Gain information regarding animal classification and systematic, animal structure and function relationships, evolution between and within major animal groups, human evolution and animal reproduction and development



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Paper XX (D): Parasitic Protozoa & Helminthes II

CO1	Study of life cycles of Helminthes parasitic disease, its control, treatment and prophylaxis
CO2	Explain the methods used for diagnosis and treatment of Helminth diseases.
CO3	Distinguish the methods used for protection of parasitic infectious diseases.




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Department of Mathematics
Course Outcomes
B.Sc. First Year
Semester I & II

Paper MAT 101 Differential Calculus	
CO1	Solve problems on limits continuity and successive differentiation of Functions
CO2	Determine partial derivative of function more than one variable
CO3	Describe Rolle's Theorem, Lagrange's and Cauchy's mean value theorem
CO4	Describe partial differentiation and able to calculate partial derivatives of higher Order.
CO5	Determine gradient, divergence and curl and directional derivatives

Paper MAT 102 Differential Equations	
CO1	Determine solution of first order linear differential equation
CO2	Determine solution of exact differential equation
CO3	Find the solution of ordinary differential equation with more than two variables.
CO4	Determine solution of linear homogeneous differential equation
CO5	Describe partial differential equation and derivative of partial differential eq ⁿ

Paper MAT 201 Integral Calculus	
CO1	Solve Basic Integral Calculus problems
CO2	Find integration of algebraic rational functions
CO3	Apply fundamental theorem of integral calculus
CO4	Calculate the length of arc of a curve.
CO5	Apply the theorems of Gauss, Green's and Stoke's theorem

Paper MAT 202 Geometry

CO1	Identify and use different type of equations of plane
CO2	Determine equations of the system of planes and the length of perpendicular to a plane
CO3	Determine equation of right line and the angle between the plane and line
CO4	Determine equation of sphere and its intersection with the plane
CO5	Describe the tangent lines and tangent planes to central conicoid.

B.Sc. Second Year**Semester III & IV****Paper MAT 301 Number Theory**

CO1	Describe division algorithm and solve the problem on it
CO2	Determine GCD and LCM by using Euclidean algorithm
CO3	Describe method of solving linear Diophantine equation
CO4	Determine solution of linear congruence
CO5	Describe the Euler's generalization of Fermat's theorem and Euler's phi function

Paper MAT 302 Integral Transforms

CO1	Define beta and gamma functions and derive their properties and apply them in evaluating integrals
CO2	Determine Laplace transform for various functions, properties of Laplace transforms
CO3	Determine inverse Laplace transform, properties of inverse Laplace Transform
CO4	Determine Fourier transform, properties of Fourier transform, Fourier sine and cosine transforms
CO5	Apply Laplace transform to find solutions of ordinary and partial differential equations

Paper MAT 303 Mechanics - I

CO1	Describe different types of forces, triangle law of forces, Parallelogram of forces, resultant of forces, sine rule and cosine rule
CO2	Explain resultant of several coplanar forces, equation of the line of action of the resultant, equilibrium of a rigid body under 3 coplanar forces




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CO3	Explain Lammi's theorem and polygon of forces
CO4	Explain vector moment of a force and vector moment of couple
CO5	Describe basic concepts of centre of gravity and its applications

Paper MAT 401 Numerical Analysis

CO1	Explain Bisection Method, Method of False Position, Newton-Raphson Method
CO2	Describe Finite Differences, Newton's Formula for Interpolation, Lagrange's Interpolation Formula, Divided Differences
CO3	Describe Least Square Curve Fitting Procedures, Fitting a straight line, Chebyshev polynomial, Power series
CO4	Calculate Solution of Linear system of equations, Eigen values and Eigen Vectors
CO5	Find the solution of ordinary differential equation of by Euler, Taylor and Runge-Kutta method

Paper MAT 402 Partial Differential Equations

CO1	Define partial differential equations and Geometrical interpretation of the Lagrange's linear partial differential equation
CO2	Find different types of solutions like complete integral, Singular integral and general integral
CO3	Determine the solution of partial differential equations using Charpit's Method
CO4	Classify partial differential equations to special types
CO5	Describe Monge's Method, Method of transformation

Paper MAT 403 Mechanics - II

CO1	Find velocity and acceleration in terms of vector derivatives, curvature, Angular speed and angular velocity
CO2	Describe Radial and Transverse components of velocity and acceleration, areal

	speed and velocity
C03	Explain Newton's Law of motion, angular momentum, work, energy, vector point function, Field of force
C04	Describe motion under gravity, projectile, Motion of projectile, Parabola of safety
C05	Describe areal velocity of central orbit, Pedal's equation



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B.Sc. Third Year Semester V & VI

Paper MAT 501 Real Analysis - I

CO1	Describe sets, functions, real valued functions, countable sets, Least upper Bound axiom and greatest lower bound axiom.
CO2	Define different types of sequence and series with examples
CO3	Describe limit superior, limit inferior and Cauchy sequence
CO4	Describe absolute and conditional convergence of the series
CO5	Explain Jacobian of implicit function and necessary and sufficient condition for a Jacobian to vanish

Paper MAT 502 Abstract Algebra - I

CO1	Explain elementary concepts of sets, functions and integrals
CO2	Describe group, subgroup, counting principle, Normal subgroup, Quotient groups, Homomorphism
CO3	Define homomorphism, automorphism, kernel of a homomorphism, isomorphism.
CO4	Define rings, zero divisors of a ring, integral domain, field with examples
CO5	Describe ideals, quotient rings and polynomial rings

Paper MAT 504 Ordinary Differential Equation - I

CO1 Define Basic concepts of ordinary differential equation

CO2 Describe linear equation of first order and the general linear equation of first order

CO3	Solve problems associated with differential equation
CO4	Find the second order homogeneous equation and initial value problems for second order equations
CO5	Define linear dependence and independence with examples and solve the examples using formula for Wronskian

Paper MAT 601 Real Analysis – II

CO1	Define Basic concepts of metric spaces and limits in metric spaces
CO2	Explain open sets and closed sets with examples. Prove the related theorems
CO3	Describe connectedness, completeness and compactness with the examples
CO4	Verify the function to be Riemann integral. Prove the properties of Riemann Integral.
CO5	Define Fourier series with examples

Paper MAT 602 Abstract Algebra – II

CO1	Define Basic concepts of vector space and subspaces
CO2	Describe linear independences with examples
CO3	Give examples of bases for vector spaces.
CO4	Solve examples on inner product spaces, Schwarz inequality and orthonormal set
CO5	Define modules and sub modules and homomorphism of modules

Paper MAT 604 Ordinary Differential Equation – II

CO1	Solve initial value problems for homogeneous differential equations
CO2	Explain reduction of the order of a homogeneous equation, nonhomogeneous Equations.
CO3	Find homogeneous equation with analytic coefficients, the Legendre equation
CO4	Define the Euler equation, second order equations with singular points
CO5	Explain the general case of second order equations with regular singular points




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Department of Home Science
Attainment of Course Outcomes

Semester I, III, V

Faculty	Class	Paper	Target Level %	Achievement Level %	Remarks
B.A	First Year Semester I	Introduction to Family resource Management- I	60 %	65.07%	Increased
		Basic Nutrition- II	70 %	89.13%	Increased
	Second Year Semester III	Food & Nutrition–V	70 %	91.12%	Increased
		Textile and clothing (Garment Designing and Printing)– VI	70 %	94.12%	Increased
	Third Year Semester V	Marriage and Family Dynamics- IX	70%	96.66%	Increased
		Housing and Interior Decoration– X	70%	92.66%	Increased
		Nutritional Management in Health and Disease- XI	70%	93.87%	Increased




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Department of Home Science
Attainment of Course Outcomes

Semester II, IV, VI

Faculty	Class	Paper	Target Level %	Achievement Level %	Remarks
BA	First Year Semester II	Extension Education- III	60%	66.98	Increased
		Food & Nutrition- IV	70%	88.09%	Increased
	Second Year Semester IV	Child Development (Late Childhood and Adolescent)- VII	70%	91.23%	Increased
		Food and Nutrition– VIII	70.0%	95.65%	Increased
	Third Year Semester VI	Human Development (Adulthood, & Old age)- XIII	70%	94.22%	Increased
		Fundamentals of Art and Design- XIV	70%	96.18	Increased
		Communication Process in Home Science- XV	70%	93.96%	Increased
		Project Work- XVI	70%	79.75%	Increased




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Department of Computer science
Attainment of Course Outcomes
Semester I, III, V

Faculty	Class	Paper	Target Level %	Achievement Level %	Remarks
B.SC.	First Year Semester I	Paper: CMP111 COMPUTER FUNDAMENTAL	80%	89.07%	Increased
		Paper: CMP112 OPERATING SYSTEM	80%	87.13%	Increased
	Second Year Semester III	PAPER:CS07 ADVANCE PROGRAMING	80%	82.88%	Increased
		PAPER: CS08 DATA STRUCTURE	80%	84.12%	Increased
	Third Year Semester V	Paper No. : CS016 SOFTWARE ENGINEERING	80%	87.60%	Increased
		Paper:CS016 WEB DESIGNING	80%	88.78%	Increased




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Department of Computer science
Attainment of Course Outcomes
Semester II, IV, VI

Faculty	Class	Paper	Target Level %	Achievement Level %	Remarks
B.SC	First Year Semester II	Paper: CMP211 DIGITAL ELECTRONIC	80%	83.98	Increased
		Paper: CMP221 BASIC C PROGRAMING	80%	82.54%	Increased
	Second Year Semester IV	PAPER: CSO11 PROGRAMING IN CPP	80%	87.23%	Increased
		PAPER: CSO12 DBMS USING SQL	80%	88.65%	Increased
	Third Year Semester VI	PAPER NO. : CSO19 DATA COMMUNICATION AND NETWORKING	80%	87.22%	Increased
		Paper: CSO20 ETHICS AND CYBER LOW	80%	88.18%	Increased




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Department of Geography
Attainment of Course Outcomes
Semester I, III, V

Faculty	Class	Paper	Target Level %	Achievement Level %	Remarks
BA	First Year Semester I	Physical Geography-I	70%	90.33%	Increased
		Human Geography-II	70%	92.12%	Increased
	Second Year Semester III	Climatology-VI	70%	94.33%	Increased
		Population Geography-VII	60 %	68.07%	Increased
	Third Year Semester V	Physical Geography of India-XI	70 %	88.17%	Increased
		Geography of Environment-XII	70 %	93.32%	Increased
		Industrial Geography of Maharashtra-XIII	70 %	93.15%	Increased




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Department of Geography
Attainment of Course Outcomes
Semester II, IV, VI

Faculty	Class	Paper	Target Level %	Achievement Level %	Remarks
BA	First Year Semester II	Geography of Landform-.III	70%	89.11%	Increased
		Geography Of Maharashtra-IV	70%	94.33%	Increased
		Practical-P1	70%	88.17%	Increased
		Practical-P2	70%	91.37%	Increased
	Second Year Semester IV	Oceanography-VIII	70%	95.17%	Increased
		Settlement Geography-.IX	70.0%	91.56%	Increased
		Practical-X	60%	69.33%	Increased
	Third Year Semester VI	Agricultural Geography of India-XIV	70%	87.32%	Increased
		Geography of Natural Calamity-XV	70%	92.56%	Increased
		Bio-Geography-XVII	70%	93.63%	Increased
		Practical-XVI	70%	93.12%	Increased
		Practical(Main)-XVIII	70.0%	91.56%	Increased
		Project Work (Main)-XIX	70%	90.41%	Increased



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Department of Botany
Attainment of Course Outcomes
Semester I, III, V

Faculty	Class	Paper	Target Level %	Achievement Level %	Remarks
B.SC.	First Year Semester I	Paper: I . Diversity of Cryptogams -I	85 %	92.12%	Increased
		Paper: II . Morphology of flowering plant.	80%	91.66%	Increased
	Second Year Semester III	PAPER: IX .Taxonomy of Angiosperm.	80%	91.66%	Increased
		PAPER: X. Plant Ecology.	79 %	82.07%	Increased
	Third Year Semester V	Paper No. : XVII.Cell Biology and Molecular Biology	79 %	87.13%	Increased
		Paper:XVIII. Diversity of Angiosperm –I	85 %	92.12%	Increased




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Department of Botany
Attainment of Course Outcomes
Semester II, IV, VI

Faculty	Class	Paper	Target Level %	Achievement Level %	Remarks
B.SC	First Year Semester II	Paper: V. Diversity of cryptogams II	85%	96.65%	Increased
		Paper: VI. Histology Anatomy and Embryology.	80%	88.22%	Increased
	Second Year Semester IV	PAPER: XIII .Gymnosperm Utilization of plants.	80%	96.98%	Increased
		PAPER: XIV. Plant physiology.	80%	87.09%	Increased
	Third Year Semester VI	PAPER NO. : XXI. Genetics and Biotechnology.	85%	92.23%	Increased
		Paper:XXII.Diversity of angiosperm –II.	85%	96.65%	Decreased




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