

Mungasaji Maharaj Mahavidyalaya, Darwha

Department of Physics

M.Sc. Physics :

Programme Outcome, Programme Specific Outcomes, Course Outcomes:

POs:

1. On completion of program, students would be able to Gain advanced knowledge, general competence, and analytical skills that are required in industry, consulting, education, and research.
2. Instill an inquisitive mind set in the students so that they are capable of independent and critical thinking.
3. Get trained in such a way that they can objectively carry out investigations, scientific and/or otherwise, without being biased or without having any pre conceived notions.
4. Apply the knowledge and skill in the design and development of Electronics circuits to fulfill the needs of Electronic Industry.
5. Become professionally trained in the area of electronics, optical communication, nonlinear circuits, materials characterization and lasers.
6. Develop research problems related to Physics and Materials characterization and applications.
7. Get nurtured as good researchers in the field of technology too.
8. Demonstrate highest standards of Actuarial ethical conduct and Professional Actuarial behavior, critical, interpersonal and communication skills as well as a commitment to life-long learning.

PSOs:

Upon completion of the programme successfully, students would be able to

1. Understand the basic concepts of physics particularly concepts in classical mechanics, quantum mechanics, statistical mechanics, electrodynamics and electronics to appreciate how diverse phenomena observed in nature follow from a small set of fundamental laws.
2. Learn how to perform experiments in basic as well as advanced areas of Physics such as Nano materials, Condensed Matter Physics, Electronics and Photonics.

3. Develop Analytical and integrative problem-solving methodologies through research-based learning.
4. Pursue research careers, careers in academics, in industries in physical science and in allied fields.

COs:

(1PHY1: Mathematical Physics)

1. Explain vector spaces and transformations, the algebra of matrix, partitioning of matrices; solve the eigen value problem.
2. Define and analyze limits and continuity for complex functions as well as consequences of continuity; apply the concept and consequences of analyticity and the Cauchy-Riemann equations; analyze sequences and series of analytic functions and types of convergence.
3. Obtain the general solution of a homogeneous linear constant-coefficient second-order differential equation; classify and explain the functions of different types of differential equations; explain the properties of Legendre Polynomial which may be solved by application of special functions.
4. Recall the power series method in solving differential equations, and know how to check the correctness of the result; solve differential equations like Legendre, Bessel and Hermite that are common in physical sciences.
5. Solve transfer functions in Instrumentation using Laplace transforms and apply Fourier transforms in various physical problems.

COs:

(1PHY2: Classical Mechanics)

Upon completion of the course successfully, students would be able to

1. Explain the basics of Newtonian mechanics and its limitations; state the conservation laws and theorems.
2. Describe the motion of a mechanical system using Lagrange and Hamilton's formalism.
3. Explain the motion of particle in central force field.
4. Describe the stability of circular orbits, its classification and differential equation, derive Kepler's laws.
5. Explain the classical background of quantum mechanics and get comfortable with Poisson brackets and Hamilton -Jacobi equation; develop the understanding of canonical transformation and small oscillation.

COs:

(1PHY3: Quantum Mechanics-I)

Upon completion of the course successfully, students would be able to

1. Be familiar with the main aspects of the historical development of quantum mechanics and be able to discuss and interpret experiments that reveal the wave properties of matter, as well as how this inspired replacing classical mechanics with a wave equation;
2. Gain the knowledge about quantum mechanical axioms and the matrix representation of quantum mechanics;
3. The Schrödinger equation on their own for simple systems in one to three dimensions, both an analytically and by using robust numerical methods; use these solutions to calculate their time evolution, associated probabilities, expectation values, and uncertainties, as well as give concise physical interpretations and reasoning underlying the mathematical results;
4. Grasp the concepts of angular momentum and spin, as well as the rules for quantization.
5. Distinguish between Schrodinger, Heisenberg and Interaction representations; use commutation relations to explain the outcome of measurements and apply Variation method to obtain the ground state energy of various systems and WKB method for one dimensional problems.

COs:

(1PHY4: Computational Methods and Programming)

Upon completion of the course successfully, students would be able to

1. Iteratively find the roots of smoothly varying functions with non-zero derivatives; carry out matrix operations, including inverses and determinants.
2. Solve systems of linear equations using multiple methods, including Gaussian elimination and matrix inversion; determine eigen values and eigenvectors; use numerical methods for interpolation, finding roots of equations and curve fitting.
3. Use numerical differentiation and integration for problems in physics; numerically, solve ordinary differential equations with boundary value problems.
4. Independently program computers using high level programming language (C-programming).
5. Formulate and computationally solve the selected problems in physics using C-programming.

Cos:

(1PHY5- Computer Lab)

Upon completion of the course successfully, students would be able to

1. Read, understand and trace the execution of programs written in C language.
2. Write the C code for a given algorithm.
3. Write programs that perform operations using derived data types.
4. Solve an algebraic or transcendental equation using an appropriate numerical method.
5. Develop and execute of C-language based programs.
6. Formulate codes to solve theoretical problems in physics using various computational tools

Cos:

(1PHY6- General Lab)

Upon completion of the course successfully, students would be able to

1. Organize and assemble
 - Experiments on Mechanics
 - Experiments on Optics
 - Experiments on Modern Physics
2. Perform data acquisition using assembled experiment.
3. Engage in experimental troubleshooting with teaching assistants.
4. Identify sources of error and fluctuations in the collected data.
5. Construct graph on graph paper and also using computer based the collected data.
6. Analyze the collected data.
7. Distinguish between theoretical predictions and experimental measurements.
8. Verify the fundamental laws and universal constants in Mechanics, Optics and Modern Physics.

Programme: M.Sc. Physics**Semester II****COs:****(2PHY1 Electrodynamics-I)**

Upon completion of the course successfully, students would be able to,

1. Solve electrostatic potential; Poisson and Laplace equations; Electrostatic energy density; electric energy of a charge distribution.
2. Solve boundary value problems with the help of Poisson and Laplace equations; Green's function.
3. Apply Biot-Savart Law and Ampere's law for straight wire, loop, solenoid, toroid, current sheet; Magnetic moment, magnetic force and torque on a circuit.
4. Solve the multiple expansion of potential and field; Material media, boundary conditions; Dielectric sphere in uniform field; Susceptibility and polarizability, and apply to molecular model.
5. Estimate time varying fields; scalar and vector potentials, gauge invariance, wave equations and to solve Poynting theorem. Solve electrostatic potential; Poisson and Laplace equations; Electrostatic energy density; electric energy of a charge distribution.
6. Solve boundary value problems with the help of Poisson and Laplace equations; Green's function.
7. Apply Biot-Savart Law and Ampere's law for straight wire, loop, solenoid, toroid, current sheet; Magnetic moment, magnetic force and torque on a circuit.
8. Solve the multiple expansion of potential and field; Material media, boundary conditions; Dielectric sphere in uniform field; Susceptibility and polarizability, and apply to molecular model.
9. Estimate time varying fields; scalar and vector potentials, gauge invariance, wave equations and to solve Poynting theorem.

COs:**(2PHY2: Quantum Mechanics-II)**

Upon completion of the course successfully, students would be able to

1. Derive from first principles, the expression for the first and second order energy shifts due to a perturbation for the non-degenerate and degenerate states and use this expression for obtaining fairly accurate energies corresponding to these states of perturbed systems;
2. Solve the time dependent perturbation problems for quantum systems and predict the consequences; understand the possibility stimulated emission in the atomic systems as a result of interaction with the electromagnetic radiation.
3. Understand the quantum theory of scattering and apply it to gain the knowledge about low and high energy physics scattering phenomenon.
4. Construct the wave functions for the systems of identical particles; relate the symmetry property of the wave function to the spin of the particles (Bosons and Fermions) and applicability of Pauli's exclusion principle.
5. Explain the KG equation and Dirac's equation (relativistic wave equations) and its free-particle solutions; be able to explain the KG equation (relativistic wave equation) and its free-particle solutions.
6. Derive from first principles, the expression for the first and second order energy shifts due to a perturbation for the non-degenerate and degenerate states and use this expression for obtaining fairly accurate energies corresponding to these states of perturbed systems;
7. Solve the time dependent perturbation problems for quantum systems and predict the consequences; understand the possibility stimulated emission in the atomic systems as a result

- of interaction with the electromagnetic radiation.
8. Understand the quantum theory of scattering and apply it to gain the knowledge about low and high energy physics scattering phenomenon.
 9. Construct the wave functions for the systems of identical particles; relate the symmetry property of the wave function to the spin of the particles (Bosons and Fermions) and applicability of Pauli's exclusion principle.
 10. Explain the KG equation and Dirac's equation (relativistic wave equations) and its free-particle solutions; be able to explain the KG equation (relativistic wave equation) and its free-particle solutions.
 11. Derive from first principles, the expression for the first and second order energy shifts due to a perturbation for the non-degenerate and degenerate states and use this expression for obtaining fairly accurate energies corresponding to these states of perturbed systems;
 12. Solve the time dependent perturbation problems for quantum systems and predict the consequences; understand the possibility stimulated emission in the atomic systems as a result of interaction with the electromagnetic radiation.
 13. Understand the quantum theory of scattering and apply it to gain the knowledge about low and high energy physics scattering phenomenon.
 14. Construct the wave functions for the systems of identical particles; relate the symmetry property of the wave.
 15. Function to the spin of the particle s(Bosons and Fermions) and applicability of Pauli's exclusion principle.
 16. Explain the KG equation and Dirac's equation (relativistic wave equations) and its free-particle solutions; be able to explain the KG equation (relativistic wave equation) and its free-particle solutions.

COs:

(2PHY3 Solid State Physics)

Upon completion of the course successfully, students would be able to

1. Describe Single Crystal and Poly Crystals, Crystal Symmetry, Symmetry Elements, Crystal Types, Bravais Lattices.
2. Use different X-ray techniques.
3. Interpret the Powder Photograph; Bernal Chart; Brillouin Zones.
4. Discuss the inter-Atomic Forces Cohesive Energy of a Solid; Infrared Absorption by Ionic Crystal Lattice; anharmonicity and thermal Expansion.
5. Study the Debye and Einstein Law, Lattice Specific Heat, Einstein and Debye Theories, Electronic and Lattice Contributions to Specific Heat.

COs:

(2PHY4 (i): Network Theorems and Solid State Devices)

Upon completion of the course successfully, students would be able to

1. Analyze the circuits using Kirchhoff's law and network simplification theorems.
2. Explain and understand the physical concepts underlying the operation of semiconductor devices; have ability to design and analyze simple FET and MOSFET amplifier circuits.
3. Design and analyze simple rectifiers and voltage regulators using diodes; have ability to design and analyze simple circuits using semiconductor switching devices like triac, diac and SCR.
4. Design and analyze simple BJT amplifier circuits; design and analyze simple BJT oscillator and multi-vibrator circuits.
5. Understand the construction, working and uses of various transducers; understand the construction and operation of basic measuring instruments.

COs:**(2PHY5- Lab on Solid State Physics)**

Upon completion of the course successfully, students would be able to

1. Organize and assemble
 - Experiments on Laser/ Solid State Physics
 - Experiments on Modern Physics
 - Experiments on Nuclear Counters
2. Perform data acquisition using assembled experiment.
3. Engage in experimental troubleshooting with teaching assistants.
4. Identify sources of error and fluctuations in the collected data.
5. Construct graph on graph paper and also using computer based the collected data.
6. Analyze the collected data.
7. Distinguish between theoretical predictions and experimental measurements.
8. Verify the fundamental laws of Modern Physics.

COs :**(2PHY6- Lab on Electronics)**

Upon completion of the course successfully, students would be able to

1. Analyze the characteristics of different electronic devices such as diodes, transistors etc., and design simple circuits like rectifiers, amplifiers etc.
2. Measure voltage, frequency and phase of any waveform using s CRO.
3. Generate sine, square and triangular waveforms with required frequency and amplitude using function generator.
4. Engage in experimental troubleshooting of electronic.

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Programme- M. Sc. (Botany)

POs:

By the end of the programme, students would be able to

PO1: Deep subject Knowledge and intellectual breadth : Apply the subject knowledge to the solution of real-world problems.

PO2: Professional Ethics: Apply ethical principles and commit to professional ethics.

PO3: Creative &Critical Thinking : Take informed actions after identifying the assumptions that frame our thinking and actions, checking out the degree to which these assumptions are accurate and valid, and looking at our ideas and decisions (intellectual, organizational, and personal) from different

PO4: Innovation, Research and Problem Solving: Identify, formulate, review research literature, and analyze complex problems reaching substantiated and innovative conclusions. Design solutions for complex problems with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations. Use research-based knowledge and research methods to provide valid conclusions. Demonstrate the knowledge of, and need for sustainable development.

PO5: Team work and Communication Skills: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings. Present/communicate research at national/international level, write effective articles, reports and design documentation, make effective presentations, and give and receive clear instructions. Communicate disciplinary knowledge to the community and broader public.

PO6: Professionalism and Leadership Readiness: Demonstrate personal accountability and effective work habits, e.g., punctuality, working productively with others, and time as well as workload management. Demonstrate integrity and ethical behavior, act responsibly with the interests of the larger community in mind, and to learn from his/her mistakes. Use the strengths of others to achieve common goals, and use interpersonal skills to coach and develop others. Assess and manage his/her emotions and those of others; use empathetic skills to guide and motivate.

PO7: Lifelong learning: Recognize the need for, and have the preparation and ability to engage in independent and lifelong learning in the broadest context of technological change.

PO8: Competence for Digital World: Prepare well for living, learning and working in a Digital Society; Create, select, and apply appropriate techniques, resources, and modern ICT tools to complex activities with an understanding of the limitations. Use existing digital technologies ethically and efficiently to solve problems, complete tasks, and accomplish goals. Demonstrate effective adaptability to new and emerging technologies.

PO9: Global Citizenship: Act with an informed awareness of global issues. Engage in initiatives that encourage equity and growth .

PSOs:

After completing the programme successfully, students would be able to

1. explore the cutting edge technologies and skills currently used in plant science
2. Be aware of social, environmental issues and plant significance in natural interest.
3. create interest in nature conservation and save the natural resources.
4. study the concepts of genetics, plant breeding and their applicability.

5. understand and correlate the various biochemical and physiological processes in plants.
6. study the evolutionary process in Bryophytes and Pteridophytes.

Programme M. Sc. Botany

Semester I

Paper-II: Cell and Molecular Biology

Cos :

Upon completion of this course successfully, students would be able to

1. understand structural organization and functional role of cell, organelles and biomolecules.
2. correlate the various life processes and their functioning.
3. understand the process of chromosomal organization and its role in cellular metabolism.
4. evaluate the various life processes and their regulations with special reference to regulation of gene expression.

Course Outcomes:

1. Develop strong fundamental basics of cell dynamics.
2. They would be able to analyze and interpret the cell behavior, cell cycle and cell communication processes.
3. They would be able to predict disorders within the biological systems related to gene regulation.
4. They would be able to illustrate and justify the biological mechanisms
Able to explain the structure, synthesis and processing of Nucleic acids.

Programme M. Sc. Botany

Semester I

Paper-II: Evolution and Diversity of Algae and Fungi

Cos:

Upon completion of this course successfully, students would be able to

1. Understand the phycology with special reference to Indian work.
2. Identify Algae in diversified habitats (Terrestrial, fresh water, marine) Criteria used in classification of algae, Role of algae in human welfare
3. Know General account of thallus organization, reproduction and life history of algae.
4. Study important groups of algae Cyanophyta, Chlorophyta, Charophyta, Xanthophyta, Bacillariopyta, Phaeophyta & Rhodophyta.
5. Study General Characters of Fungi Classification., Economic importance of fungi in medicine,
6. Use Algae and fungi in Agriculture (Biopesticide and biofertilizer) & Fungi as plant pathogen.

Programme M. Sc. Botany

Semester I

Paper-III: Economic Botany and Resource Utilization

Cos :

Upon completion of this course successfully, students would be able to

1. Study the origin, divarication, utility and conservation strategies & natural resources
2. Study importance of food, fiber, medicines & oil yielding plant.
3. Study the plants and their value in the service & mankind.
4. Study the conservation of biodiversity.

Practical – I: Cell and Molecular Biology

Programme M. Sc. Botany

Semester I

Paper-IV : Plant Development

Cos :

Upon completion of this course successfully, students would be able to

1. Deal with regulation of growth and development of plants in relation to bio-molecular interaction.
2. know the various structural and anatomical components of plant tissue and reproductive parts.
3. Understand Structure and development of Flower, Male gametophyte, Female gametophyte, Seed development, dormancy.

COs:

Laboratory Exercises

1. Differential Centrifugation for isolation of cell fractions.
2. Isolation and extraction of cell organelles like mitochondria/ chloroplast.
3. Isolation of Polytene Chromosome from *Chironomus/ Drosophila* larvae.
4. Isolation and observations of B Chromosome.
5. Preparation of cytological slides for chromosomal non-disjunction in *Rhoeo/ Tradescantia*.
6. Prepare slides of mitosis and meiosis in some monocots and dicots like *Allium, Aloe, Maize, Brassica* etc.
7. To determine mitotic index.
8. SDS PAGE separation of seed storage proteins and quantification of each fragment.
9. Isolation and purification of genomic DNA from plant materials by CETAB Method.
10. Isolation and purification of RNA from plants.
11. Quantitative estimation of genomic DNA and RNA using spectrophotometer.
12. Agarose gel electrophoresis of genomic DNA and RNA and detection using gel documentation system.
13. Digestions of DNA by restriction enzymes and size fractionation of fragments
14. Isolation of Plant DNA and prepare Cot curve.

15. Demonstration of western blotting.
16. Study of electron micrographs of cell organelles.
17. Study of permeability of living cell to acids and bases.
18. Visit to National Laboratory or Research Lab to study latest techniques or sophisticated equipment from technical person.

Programme M. Sc. Botany

Semester I

BOEC I :Medicinal Plant Diversity

Cos:

Upon completion of this course successfully, students would be able to
1.study the Ethnic tribes in ethnobotany.

Programme: M.Sc. Botany

Semester II

DSC V: Plant Physiology

Cos :

Upon completion of this course successfully, students would be able to

Grasp concepts of proteins, enzymes, basic plant signaling mechanisms, sensory photobiology.
deal with physiology of nutrient uptake, photosynthesis and nitrogen metabolism.

Programme M.Sc. Botany

Semester II

DSC VI : Evolution and Diversity of Bryophytes and Pteridophytes

Cos :

Upon completion of this course successfully, students would be able to

1. understand evolutionary diversification of early land plants and morphology and reproduction in bryophytes, pteridophytes.
2. know the Ecological and Economic Importance of bryophytes, pteridophytes.
3. classify Bryophytes into various groups, study their importance
4. classify Pteridophytes into various groups, study their importance and multiplication of important ferns
5. know the applied aspects of Bryophytes and Pteridophytes.

Programme M.Sc. Botany

Semester II

DSC VII : Genetics and Plant Breeding

Cos:

Upon completion of this course successfully, students would be able to

1. understand the concept of classical and modern genetics clearly.
2. study the inheritance pattern.
3. know the role of chromosomes in evolution and the factors leading to changes in them.
4. study mutations and breeding and their significance in crop improvement.
5. study the variation in populations.

Programme M.Sc. Botany

Semester II

DSC VIII : Plant Biochemistry and Pharmacognosy

Cos:

Upon completion of this course successfully, students would be able to

1. study the plant biochemistry and its various aspects.
2. study the metabolism and regulation of bio molecules.
3. understand the medicinal properties of plants and its constituents.
4. study the evaluation and standardization methods of drugs.



**MUNGASAJI MAHARAJ MAHAVIDYALAYA,
DARWHA 445202 DIST - YAVATMAL**



DEPARTMENT OF ECONOMICS

PROGRAMME OUTCOMES (FOR PG PROGRAMME)

- 1 To analyze the Economic Issues related to local to global scenarios.
- 2 This programme helps to understand the various Social, Political and Economic Institutions.
3. Applying their knowledge to assess issues in fields of agriculture, industry, banking and finance, environmental, and societal issues to provide practical solutions.
- 4 Formulate and execution of field study, and an industrial visit to get practical exposure to the latest issues.
- 5 To understand how economic policies affect the common people through interactions.
- 6 To utilize the research spheres of Economics.
- 7 The students should be able to find a career in Economics.

PROGRAMME SPECIFIC OUT COMES (PSOs)

- 1 Helps to understand the basic theories of economic growth and development.
- 2 Students will be able to understand the working principles of the Money market and Capital market.
- 3 Students should be able to develop knowledge about production, demand, market and pricing.
- 4 Students can know how to apply the knowledge of Economics in various sectors of society to solve various financial issues.
- 5 Able to understand the role of the public and private sectors in economic development.
- 6 Students should be able to develop knowledge about the role of International trade in economic development.
- 7 Develop, analyze and appraise developmental plan for sustainable development.
- 8 Students should be able to develop knowledge about monetary policy, fiscal policy and its implications for the economy.
- 9 Develop professional entrepreneurial ability and skills

COURSE OUT COMES (FOR PG PROGRAMME)

1. Cite the basic principles of microeconomics.
2. Interpret the concepts of utility, demand-supply mechanism, and elasticity.
3. Apply these concepts to solve and analyse various problems of economic policy.
4. Analyse the perfect competitive market framework.
5. Assess the framework and analyse microeconomic relationships.
6. Devise pricing strategies for firms and calculate productivity and costs for the firm.
7. Explain the evolution of money and know the concept of money and its functions.
8. To understand the national income concept.
9. Know about the supply of money and high-powered money.
10. To give the idea of Keynesian theory of employment.
11. To understand the theories of the consumption function.
12. To give an idea about how to make a saving and investment.
13. Evaluate the working and effects of monetary and fiscal policy.
14. Explain the scope and subject matter of agricultural economics.
15. To understand the rural infrastructure and agricultural production.
16. To analyze the issues related to agricultural and economic development.
17. Deals with the farm management and types of agricultural risk.
18. To understand the Labour Supply, Mobility of Labour and Segmentation in Labour Markets.
19. Evaluate the problem of agricultural finance and suggestion to improve agricultural finance.
20. Know about agricultural growth in India and the effects of globalization
21. To understand the concept of urbanisation and study urbanisation in developing countries.
22. To know the factors related to urbanisation and see the impact of urbanisation on the economy.
23. To know the meaning of urban planning understand Megha and Smart City planning.
24. To understand the problems of urbanisation and to know the relation between factors of urbanisation and urban development.
25. To know the government policies about urbanisation & rural development
26. To impart better education from classroom to common man.
27. To understand the development gap between urban and rural areas
28. To know the understanding and availability of resources for rural development.
29. To understand the employment opportunities and reasons of employment opportunities and reasons of unemployment in rural & urban areas.



**MUNGASAJI MAHARAJ MAHAVIDYALAYA,
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DEPARTMENT OF SOCIOLOGY

PROGRAMM OUTCOMES (FOR PG PROGRAMM)

- P O 1: To promote a commitment to the improvement about the societal understanding and social institutions.**
- P O 2: To educate the students about various sociological theories**
- P O 3: To prepare students to initiate and facilitate interactions between government and nongovernmental sectors to provide ethical and workable solutions to societal needs.**
- P O 4: To educate students to be compassionate and effective leaders who humanely manage public welfare programmes**
- P O 5: To translate research into effective practices and achievable, human policies.**
- P O 6: To encourage students to acquire knowledge, skills and capabilities arising from the need for a more efficient and effective public administration.**
- P O 7: To motivate students to utilize the job opportunities**

PROGRAMM SPECIFICOUTCOMES (FOR PG PROGRAMM)

- P S O 1: Develop the sociological knowledge and skills.**
- P S O 2: Think critically about society and social issues.**
- P S O 3: Work for social reforms.**
- P S O 4: Study and understand various culture religion and society in present context.**
- P S O 5: Study theories and thinkers sociology to develop historical sense.**

COURSE OUTCOMES(FOR PG PROGRAMM)

C O 1: Study methodology of social research.

C O2: Study rural and urban society in reality.

C O 3: Learn social movements in India.

C O 4: Study industry and society in India and the concept of political sociology.

C O 5: Study sociology of change and developments.

C O 6: Study and understand social movements in India.

C O 7: Understand theories of various thinkers of sociology.

C O 8: Develop a sense of social responsibility.

C O 9: Develop verbal and written communication skills.



**MUNGASAJI MAHARAJ MAHAVIDYALAYA,
DARWHA 445202 DIST - YAVATMAL**



DEPARTMENT OF HOME ECONOMICS

PROGRAMM OUTCOMES (FOR PG PROGRAMM)

1. Determine the problems and challenges of home and family.
2. Develop the student's understanding regarding home influences on the Individual, school and community.
3. Design a workable plan in the household budget, make appropriate Decisions apply the decision-making process.
4. Prepare a diet Plan, create innovative recipes and therapeutic diet to counter Nutritional problems and maintain the health of the family.
5. Formulate qualitative designs and descriptive survey using questionnaires, interviews, observations, and document investigation to collect, analyze, and Interpret the collected data pertaining to the study.
6. Compare knowledge of consumer rights and responsibilities, consumer Choices, investment and saving, market demands and supply laws, E-purchasing, and consumer protection.
7. Provide specific experiencing staff required for professional Home-Economics employment and self-employment.

PROGRAMM SPECIFIC OUTCOMES (FOR PG PROGRAMM)

1. Describe Family Resource Management.
2. Apply this knowledge to personal and family life.
3. Identify new techniques in Event Management.

COURSE OUTCOMES (FOR PG PROGRAMM)

1. Apply the Knowledge of energy and time management.
2. Make their carrier in the field of Event Management.
3. Evaluate plan activities use of decision-making steps.
4. Design Event plan by applying knowledge of different types of resources.
5. Determine child development problems by studying and applying study methods.
6. Evaluate the obstacles in early and late childhood.
7. Create a sense of personal care and beauty in every phase of daily living.
8. Apply obtained knowledge in pre-school and childcare institutions.
9. Develop employability and self-employment skills applicable in child care and learning.
10. Evaluate and differentiate between Textile Fibre.
11. Determine and identify general and unique finishes.
12. Apply Fabric Printing to decorate garments.
13. Describe three types of Fabric Construction Methods.
14. Generate employment using the different regional embroidery patterns and become entrepreneurs.
15. To develop the skill of designing the paper pattern for different types of garments.
16. Enhance the ability to apply the latest fashion in clothing construction.
17. Realize the meaning, process and importance of research in Home-Economics.
18. Identify problem, tools and methods for conducting research.
19. Interpret Data manually as well as on the computer.
20. Develop inclination and skill in preparing a report.
21. Apply the skill of computers in statistics.

22. Applied and counselling about the work simplification and Budget making.
23. Make carrier in the field of Interior Decoration.
24. Evaluate and planning the family Budget.
25. After completing, the course, the student should be able to.
26. Develop and nurtures their personality traits.
27. Apply the knowledge of children's rights.
28. Solve the problems of old-age senior citizens through counselling. and as a responsible Citizens.
29. Recognize the problems of adulthood and to solve through counselling.
30. Work as consultants in the social welfare department and child welfare unit.
31. The students will be able to apply and use different types of seems, Fullness, sleeve, Neckline and collars in garment construction.
32. The students will be able to explain and describe the difference between the Traditional costume of Indian Male and females.
33. To acquire knowledge of body measurements.
34. The students will be able to explain the Traditional Textile of India in their own words.
35. Develop the skill of designing a paper pattern for different types of garments.
36. Enhance the ability how to apply the latest fashion in clothing construction.
37. Define the meaning, process and importance of research in Home-Economics.
38. Criticize problem, tools and methods for conducting research.
39. Interpret Data manually as well as on a computer.
40. Develop inclination and skill in preparing a report.
41. Realize the use of computers in statistics.



**MUNGASAJI MAHARAJ MAHAVIDYALAYA,
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DEPARTMENT OF POLITICAL SCIENCE

PROGRAMM OUTCOMES (FOR PG PROGRAMM)

1. Comprehend the basic structure and functions of government systems and theoretical underpinnings
2. Analysis political problems, argument, information, theories.
3. Familiarity with different approaches to the study of Political Science and ability to apply this to contemporary political problems.
4. An ability to formulate and construct logical argument about political phenomena.
5. An ability to analysis the election data and to develop leadership qualities among students.
6. Apply methods appropriated for accumulating and interpreting data applicable to political science.

PROGRAMM SPECIFIC OUTCOMES (FOR PG PROGRAMM)

1. Enable the student to grasp knowledge of provisions in constitution of India regarding fundamental rights, duties, Directive principles, Parliament judiciary and executive body at cent and state.
2. Learn about the various Political thought in Maharashtra like Dr. Ambedkar, Dr. Punjabrao Deshmukh, and Mahatma Phule etc.
3. Student are acquainted with the Indian political thought and western political thought various ideologies like nationalism, liberalism socialism, terrorism etc.
4. Student are acquainted with the Theories and aspects of relations, non-alignment movement, new world economic order etc.
5. Learn about the political process in India and acquainted with Governance and public policy in India.

6. Students are able to develop leadership qualities and Election analysis.

COURSE OUTCOMES(FOR PG PROGRAMM)

1. The students will be able to understand the contribution and thoughts of the makers of Modern India.
2. The students will get to know the knowledge of various Ideological Streams in Indian Political Thought.
3. The students will be able to analyse the evolution of Indian Political Thought
4. Understand & explain about constitutional Development in India.
5. To understand the philosophy of Indian constitutions.
6. To appreciate the various phases of Indian national movement.
7. To understand the various Government of India acts their provision and reforms.
8. They also know about different constitutional authorities in India such as Election Commission, Finance Commission, and CAG.
9. Critically analyzing the important institutions of the Indian Union: the Executive: President; Prime Minister.
10. Assessing the nature of Indian Federalism with focus on Union-State Relations.
11. Discuss the Evolution of Public Administration.
12. Student can compare about private and public Administration.
13. The students will be explain & critical Analysis about various Approaches To the Public Administration.
14. The students will become familiar with details of administrative organization.
15. Understand key concepts, approaches and main problems of political Ideologies.
16. To think analytically on the concepts and issues involved in political ideology. 17. To explicate their own views in political ideology.
18. Develop ability to research current political issues and relate them to the

course material.

19. Explaining scope and subjectmatter of International Relations as an autonomous academic discipline.
20. Critically analyze the theories of international politics.
21. Evaluate the concept of power and its changing nature.
22. Explore the instruments for the promotion of national interest.
23. To analyses the international security Arms Race. Arms control and Disarmament.
24. Understand about various dimensions and emerging issues of international politics.
25. To familiarize the students regarding different theories and the relevant debates in the discipline of International Politics.
26. The students are introduced to democratic decentralization operating in India.
27. Student Understand Evolution of local Self Government in India.
28. To analyse Rural &Urban Local Bodies power and Function.
29. To critically studies the relationship between people's bodies and bureaucracy.
30. The students are introduced to democratic decentralisation operating in India.
31. Student Understand Evolution of local Self Government in India.
32. To analysis Rural &Urban Local Bodies power and Function.
- 33.To critically studies the relationship between people's bodies and bureaucracy.
34. Student understanding about the historical and emerging trends in political process in the India states.
35. Student explain verious Patterns of state politics.
36. The students understand the constitutional system at state level, and the relation between state politics and national politics.
37. The students will Explain Areas of state-centre conflict in Indian fedaretion,
38. The students know about political dynamics operating at state level.

39. Students Critically examine Issues of state politics like Linguistic, regional, religious
40. Explain the new world order in the context post-cold war and crisis of globalization and the global pandemic
41. Examine Chinese challenge to US hegemony and its impact on world order
42. Explain and Critique Changing nature of Terrorism.
43. Student can analyses Changing nature of security.
44. Student Examining the issues of International Inequality, Dependence.
45. Explain the new world order in the context post cold war and crisis of globalization and the global pandemic
46. Examine Chinese challenge to US hegemony and its impact on world order
47. Explain and Critique Changing nature of Terrorism.
48. Student can analyse Changing nature of security.
49. Student Examining the issues of International Inequality, Dependence.
50. The students will analyses the various ideological streams in Maharashtra Political Thought

MUNGASAJI MAHARAJ MAHAVIDYALAYA, DARWHA
DEPARTMENT OF HISTORY

(Programmed Specific Outcome and Course outcome For UG and PG)

*Programme Specific
Outcome*

- PSO:- 1- To Understand the basic themes, concepts, chronology and the scope of Indian History.
- PSO:- 2- To Be Acquainted with the range of issues related Indian History and its distinctive eras.
- PSO:- 3- To Understand the history of the countries other than India with comparative approach.
- PSO:- 4- To Think and argue historically and critically in writing and discussion.
- PSO:- 5- To Prepare for the Competitive Examinations as MPSC, UPSC.
- PSO:- 6- To study further in the applied field of history as Archaeology.

Course out come

- CO1. To Discuss the sources of ancient India.
- CO2. To Discuss the Rise of religious movement.
- CO3. TO Discuss the Mauryan, Gupta, Vakatak, Vardhan dynasty
- CO4. To Discuss the Education and Position of Woman in ancient India.
- CO5. To Discuss the early Turkish sultans of Delhi.
- CO6. To Discuss the Bahamani and Vijaynagar kingdom.
- CO7. To Discuss the Economy, Religious and Cultural life of sultanate Period.
- CO8. To Discuss the Establishment and Consolidation of Mughal Empire.
- CO9. To Discuss the Emergence of Maratha Power.
- CO10. To Discuss the Political Administration under Maratha.
- CO11. To Discuss the Advent of European Powers.
- CO12. To Discuss the Socio-religious movements India.
- CO13. To Discuss the Early Gandhi and Programs.
- CO14. To Discuss the India towards Independence.
- CO15. To Discuss the French Revolution and making of the Nations, Italy, and Germany.
- CO16. To Discuss the First World War, Causes and Effects.
- CO17. To Discuss the Mussolini and Hitler Foreign Policy.
- CO18. To Discuss the Second World War Causes and Result.
- CO19. To Discuss the United Nations Organization.
- CO20. To Discuss the Cold War-Causes and Effect.

Program Outcomes

- Capacity to explain how and why important events happen.
- Understanding of the historical method of study.
- A clear understanding of evidence collected from historical sources.
- Critical understanding of developments in historiography.
- Knowledge of the history of the India and 20th Century Modern World.
- Informed familiarity with multiple cultures and diversity.
- Awareness of current historical debates.
- Understand the skills that historians use in research.

मुंगसाजी महाराज महाविद्यालय, दारव्हा

एम. ए. मराठी (पदव्युत्तर) विभाग

Program Course Outcome

(अभ्यासक्रमाची निष्पत्ती)

- 1) जीवन व्यवहाराच्या विविध क्षेत्रातील आंतरसंबंधाचे ज्ञान प्राप्त होईल. तसेच त्यातील गुंतागुंत समजून घेऊन वैश्विक मानवतेच्या व्यापक पटावर जीवनाचे आकलन करून घेण्याची दृष्टी प्राप्त होईल.
- 2) व्यक्तिगत आणि सार्वजनिक जीवनातील बदलत्या परिस्थितीचे आकलन करून विवेकपूर्ण विचार आणि व्यवहार करण्यासाठीची विचार प्रणवता आणि कृतीशीलता निर्माण होईल.
- 3) प्रतिष्ठापूर्ण आणि आत्मसन्मानाने स्वावलंबी जीवन जगण्याची व इतरांनाही त्या दृष्टीने सहकार्य करण्याची इच्छाशक्ती अंगी बाळगता येईल.
- 4) संशोधक वृत्ती, जिज्ञासूपणा आणि ज्ञानलालचा वाढीस लागून ज्ञानाची व्यावहारिक उपयोजन करता येईल.
- 5) चिकित्सक आणि तुलनात्मक अभ्यास दृष्टीचा विकास होईल. त्यामुळे जीवनातील सैद्धांतिक आणि प्रायोगिक पातळीवरील समस्यांचे कालसापेक्ष भान निर्माण होऊन सर्जनशील पर्याय देण्याची प्रक्रिया विकसित होईल.
- 6) भाषाभान जागृत होऊन मानवी सभ्यतेतील भाषेचे प्रयोजन आणि बदलत्या काळातील त्याचे उपयोजन करता येईल. शिवाय बहुभाषिक आणि बहुसंस्कृतिक लौकिक प्राप्त करून घेता येईल.
- 7) विचार आणि भावपोषण पद्धतीने झाल्यामुळे आत्मविश्वासाने जीवन जगता येईल.
- 8) माहिती व तंत्रज्ञानाची कौशल्य विकसित करून रोजगार सक्षम करता येईल

ProgrammeSpecific Outcome

(अभ्यासक्रमाची विशिष्ट निष्पत्ती)

- 1) एम. ए. मराठी अभ्यासक्रमाच्या अध्यापनामुळे विद्यार्थ्यांची साहित्य ही संकल्पना सुस्पष्ट होऊन त्याची अभिरुची वृद्धिंगत होईल
- 2) समकालीन बदलत्या संदर्भात मराठी समाज, भाषा, इतिहास, साहित्य आणि संस्कृतीचे चिकित्सक आकलन होईल.
- 3) भाषा आणि साहित्याचा सामाजिक तसेच कलात्मक पातळीवर अभ्यास केल्याने विवेकपूर्ण तर्कसंगतता आणि कारुण्यपूर्ण संवेदनशीलता निर्माण होऊन साहित्याचे व्यावहारिक उपयोजन करता येईल.
- 4) चिकित्सा, तुलना आणि समीक्षा करण्याची दृष्टी विकसित झाल्यामुळे विविध साहित्य प्रकारातील लेखनाचे योग्य अध्ययन, संशोधन आणि सर्जनशील निर्मिती करता येईल.
- 5) भाषेच्या तात्विक अभ्यासासह प्रतिष्ठापूर्ण रोजगार प्राप्तीसाठीचे भाषिक कौशल्य प्राप्त होईल.

Course Outcome

(अभ्यासपत्रिकेची निष्पत्ती)

- 1) साहित्याच्या सामाजिक व सांस्कृतिक पार्श्वभूमीचा विद्यार्थ्यांचा पाया पक्का होईल.
- 2) साहित्यविषयीची आकलनक्षमता वाढेल.
- 3) यूपीएससी, एमपीएससी, नेट-सेट व इतर स्पर्धात्मक परीक्षांची तयारी होईल.
- 4) वृत्तपत्रीय लेखन-संपादन करण्यासाठी अभ्यासाचा उपयोग होईल.
- 5) अध्यापनाच्या व्यवसायात पदार्पण करायचे असल्यास ज्ञानाच्या कक्षा अधिक रुंदावतील.
- 6) साहित्यकृतीचे वर्णन, विश्लेषण, मूल्यमापन व रसग्रहण करता येईल.
- 7) साहित्य व जीवन यांच्या परस्पर संबंधाची चिकित्सा करता येईल.
- 8) लोकसाहित्याचा अर्थ समजून लोक साहित्याचे स्वरूप, प्रकार व वर्गीकरण इत्यादींची माहिती होईल.
- 9) काव्य विषयक जाणीव, आस्वादक्षमता समृद्ध होईल.
- 10) कादंबरी या साहित्य प्रकाराची ओळख होऊन कादंबरीचे घटक व प्रकार यांची माहिती होईल.
- 11) समीक्षा ही संकल्पना स्पष्ट होऊन तिची उद्दिष्टे, महत्व आणि अपरिहार्यता याचे आकलन वाढेल.



MUNGASAJI MAHARAJ MAHAVIDYALAYA, DARWHADIST - YAVATMAL



DEPARTMENT OF COMMERCE

PROGRAMM OUTCOMES(FOR PG PROGRAMM)

1. To acquire a job as an Economist, Market Research Analyst, a banker, Management consultant, stockbroker/trader, Actuary, Financial analyst, Financial advisors or Advisor to Tax Law Court etc.
2. To acquire the process of managerial economics, demand analysis, Production theory, price determination and pricing practices, etc.
3. To acquire proficiency in the accounting concepts as well as tools and Techniques used for taking managerial decisions.
4. To master the knowledge of ratio analysis, cash flow and budgetary control.
5. To achieve decision making abilities in the situation of uncertainty in Dynamic business environment.
6. To master the conceptual framework of Management and organizational Behavior.
7. To attain understanding of computer operating system and application of Relevant software in managerial decision making.
8. To gain the knowledge of commercial banks and its transactions, nature and Scope of insurance and its kinds.

COURSE OUTCOMES (FOR PG PROGRAMM)

1. Application of concepts of Managerial Economics in the process of Business decision making
2. Application of demand supply concepts towards consumer choices
3. Compare economies and dis-economies scale of production in real life Situation
4. Assessment of Production process determination in various industries
5. Impact of business cycles in Agriculture, Industry, Services and Share Market
6. Application of pricing practices in various markets and bargaining Tendencies thereof.
7. Students will understand seven phases of marketing of service in depth.
8. Student will understand strategic issues peculiar of service marketing.
9. Students will understand an importance of new and innovative concepts of CRM, especially E-CRM.
10. Demonstrate idea creation and implementation of CRM for different Service sector.
11. Investments are assets held by an enterprise for earning income
12. Final Accounts gives an idea about the profitability and financial posting Of business to its management, ownersand other interested parties.
13. The cost sheet is prepared to ascertain cost of product/job/operation or to Giveautotimer or to determine tenderprice for supply of goods or ProvidingService.
14. Operating result the operating result is the surplus or deficit for the year Under the Accounting Standardframeworkagetting result recognizes All revenues and operating expenditure
15. Accounting for construction contracts is the allocator of contract revenue And contract.

16. Application of CIBIL Score in qualifying the proposal of advances
17. Impact of Monetary Policy on various industries
18. Impact of PMJJBY & PMSBY
19. Assessment of Claim Settlement Procedure of Life Insurance
20. Assessment of Claim Settlement Procedure of General Insurance
21. Ratio analysis compares line item data from a company's financial Statements to reveal regarding profitability individually operated ... and Solvency.
22. A cash flow analysis determines a company's working capital the amount Of money available to run businessoperation and complete transaction. That is Calculate as current assets and current liabilities
23. The outcome of Anoint in the statistics this ratio shows the difference Between the within group varianceand which ultimately produces a Figure which allows a conclusion that the hypothesis is supported or Rejected.
24. BEO tells you how many units of a product must be sold to cover the Fix3d and variable cost of production. The BEP is considered to measure Of the margin of
25. Budgetary control is the process of preparation of budgets for various Activities and company the budgetfigures for arriving at deviation of any Which to be elemental in future. Thus budget is a means andbudgetary Control is the end result.
26. Demonstrate decision making ability and dynamism.
27. Will understand major theories, background work, concept and research Output in the field of strategiesmanagement.
28. Demonstrate a proper meaning of the tools and technique used by Executives in executing strategies andwill appreciate its integrative and Interdisciplinary nature.
29. Demonstrate practical situation for diagnosing and solving organizational

Issues.

30. Relate theories and device application of it.

31. Student Understand decision making process both at individual level and In group.

32. Student Understand Power, Politics, and Accomplishing organizational Goals.

33. Students demonstrate ability to manage conflicts.

34. Students will determine Leadership style according to the situation.

35. Word processing allows students to interpret and process to understand Higher standard of word processing. Students can perform the practical Parts and remove mistakes on word documents.

36. Students should be able to demonstrate and understanding of accounting Theory. Apply accounting procedure by using computer accounting Software. Perform accounting reports and records.

37. Enable students to gain expert knowledge, principles and procedure of Computerize accounting and taxation. Critical thinking and problem Solving skills in analyzing financial information and taxation.

38. Student should know basic data types in spreadsheets. Is able to determine Database and convert them. Know basic functions to calculate Mathematical, statistical and logical operations. Have skills of data Visualizing depending on data and task types.

39. Understand how to start MS –Excel and SPSS. Enter basic data into SPSS And Carry out statistical analysis that can test hypothesis. Develop various Required graphs.

40. Describe what micro soft word 2013 and how it is useful in both personal And professional life.

41. Create a new document, work with a document, format text insert and Work with clip arts and pictures, use the mail merge, and print a Documents and create high quality document designs and layouts.

42. Enter the accounting transactions in computerized format and gate the Financial results.
43. Acquire the skill of financial decision making and interpret the financial Statements as well as evaluation of stock of the end.
44. Apply the micro soft office Excel program and modify a worksheet. Work With cell references.
45. Learn to use functions and formulas. Create and edit tables, charts and Graphs. Import and export data.



MUNGASAJI MAHARAJ MAHAVIDYALAYA, DARWHADIST - YAVATMAL



DEPARTMENT OF MATHEMATICS

PROGRAMME OUTCOMES (FOR PG PROGRAMME)

1. Apply knowledge of Mathematics, in all the fields of learning including higher research and its extensions.
2. Innovate, invent and solve complex mathematical problems using critical understanding, analysis and synthesis.
3. Adjust themselves completely to the demands of the growing field of Mathematics by lifelong learning.
4. Effectively communicate about their field of expertise on their activities, with their peer and society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations
5. Crack lectureship and fellowship exams approved by UGC like CSIR – NET and SET.

PROGRAMME SPECIFIC OUTCOMES (FOR PG PROGRAMME)

1. Develop problem-solving skills and apply them independently to problems in pure and applied mathematics.
2. Understand advanced mathematical knowledge and skills that prepare them to pursue further studies and research.
3. Understand advanced and pure mathematical concepts and research.
4. Create knowledge, capability in formulating and analyzing mathematical models of real life applications.
5. Analyze the latest advances in applied mathematics such as numerical computations and mathematical modeling in physical sciences.

COURSE OUTCOMES (FOR PG PROGRAMME)

1. Restate the ideas and concept of Riemann – Stieltjes integral with some of its properties and apply the fundamental theorem of integration.
2. Apply the Weierstrass M-test, Abel's and Dirichlet's tests for uniform convergence of sequences.
3. Differentiate between uniqueness theorem for power series, Abel's limit Theorem and Tauber's first theorem.
4. Recognize the functions of several variables, linear transformation, partial and higher order derivatives in an open subset of \mathbb{R} .
5. Demonstrate the inverse function theorem, implicit function theorem and solve problems on maxima and minima of a function.
6. Recall the concepts of coset and normal subgroup and to prove elementary Propositions involving these concepts.
7. Recognize different types of subgroups such as normal subgroups, cyclic subgroups and understand the structure and characteristics of these subgroups.
8. Demonstrate the homomorphism, sum and direct sum of ideals, maximal and prime ideals, nilpotent and nil ideals.
9. Translate the transition of important concepts of homomorphisms and isomorphisms from discrete Mathematics to advanced abstract Mathematics.
10. Interpret the Definition and examples of modules and submodules, quotient modules, completely reducible modules and free modules.
11. Identify Cauchy integral formula apply to find the value of function at inside point of the region.
12. Express the function in series of positive and negative power of variable in a given region.
13. Record the concept of singularities to find integral of complex valued

Function on some simple connected region and multi connected region.

14. Apply the residue theorem to compute several kinds of real integrals.

15. Recognize about everywhere differentiable function and they will learn
How it helps them to decide analyticity of function.

16. Identify the cardinal and ordinal numbers and their role in building up the
Topology.

17. Demonstrate the concepts such as topological spaces ,open and closed
sets,Interior, closure and boundary.

18. Categories some important concepts like continuity, compactness,
Connectedness, projection mapping etc and prove related theorems.

19. Relates the basic concepts of countability axiom, separation axioms and
Convergence in topological spaces.

20. Distinguish between the regular , normal and completely regular spaces.

21. Discuss the local intrinsic properties of a surface, curves on a surface,
Surfaces of revolution.

22. Design arguments in the geometric description of family of curves and
Surfaces in order to establish basic properties of geodesics.

23. Apply Geodesics theorem and restate the Gaussian Curvature, Surface of
Constant curvature, conformal and Geodesic mappings.

24. Recognize the tensor calculus, tensor product of vector spaces,
Transformation formulae, contraction special tensors, and inner product.

25. Apply covariant differentiation, of tensors and use absolute derivation of
Tensorialforms and tensor connexion.

26. Analysis Lebesgue outer measure, regularity and Lebesgue measurability

27. Explain integration and non-negative function, the general integral,
Riemann and Lebesgue integrals

28. Demonstrate the concepts of four derivatives, differentiation and
Integration

29. Discuss the measure and outer measure

30. Express completion of measure, measure spaces, Holder and Minkowski Inequality.
31. Recall the concepts of eigenvalues ,eigen vectors and polynomials.
32. Explain quadratic form, linear transformation, canonical and normal form.
33. Describe the concepts of algebraic extension of fields.
34. Discuss normal and separable extension of Group.
35. Understand the concepts of Galois theory and its application.
36. Understand the type of integral equations.
37. Categorize Volterra integral equations of first and second kinds.
38. Determine the solution of Fredholm integral equations of the second kinds.
39. Define the concepts of iterated kernels and reciprocals kernels.
40. Explain solution of Volterra integral equations of second kinds.
41. Categorize some important concepts of metric spaces.
42. Restate the ideas and concepts of complete metric spaces.
43. Interpret the definition and examples of product spaces.
44. Express the function and quotient spaces.
45. Discuss the metrization and paracompactness.
46. Discuss the properties of Christoffel symbols, divergence, gradient and Laplacian.
47. Demonstrate the concepts of parallel vector field.
48. Interpret the concepts of curvature tensor.
49. Categorize some concepts like Ricci tensor, curvature invariant and Einstein tensor.
50. Summarize the concepts of Riemannian curvature , space of constant Curvature, intrinsic symmetric and killing vectors.



MUNGASAJI MAHARAJ MAHAVIDYALAYA, DARWHA DIST - YAVATMAL



M.Sc. (Zoology)

POs:

The post graduate course of Zoology will provide theoretical as well as experimental knowledge as per the courses included under the syllabi by which build up creativity in students will lead towards thorough learning and development of ideas of research work and will become ready to face recent challenges. Students can attain the employability skills through the experiences based on their practical knowledge.

After completion of MSc in Zoology successfully, the students would be able to:

1. Demonstrate the significance of the topics of syllabi and evaluate its relevance. Think creatively for its gravity and develop ideas.
2. Interpret scientific ideas and its analysis. Create experiments independently and draw inferences by sharing it with others.
3. Derive information from various digital sources. Develop skills for scientific writing and present the data and analyse it scientifically.
4. Articulate scientific ideas lay down a hypothesis, design the pathway to develop research ideas.
5. Acquaint skills in handling the instruments and different techniques through the practicals and developing the scientific temperaments for research.
6. Develop competence through healthy atmosphere and a quality intercommunication with different groups.
7. Understand environmental and sustainability issues and its sensitivity and regional relevance.
8. get the facility of different training and internship programs through job-oriented curriculum
9. Utilize the sources confidently and independently and develop self-sustenance.

PSOs:

Upon completion of the programme successfully, students would be able to

1. Learn to prepare the checklist and inventories through the identification of the fauna in local areas being Melghat Tiger Reserve and Pohra Forest are very nearer to survey.
2. Gain comprehensive knowledge about different animals and develop confidence to handle them during research work.
3. Interpret metabolic pathways, their correlation in concern with prokaryote and eukaryotes.
4. Compare genetic aspects, genetic traits, diseases and their specific causes.
5. Survey and analyse data of the various kinds of diseases in the locality.
6. Understand the various strategies and phenomena related to animal reproduction and their development.
7. Get acquainted with conservation strategies and environmental threats to reduce and save energy through Wildlife Week Celebration.
8. Compare the different developmental events during embryogenesis of different animals.

Cos:

(1ZOO1: Animal Structure and Function (Non-Chordata):

Upon completion of this course successfully, Students would be able to:

1. Find out the taxonomic characters of the different animals and apply for forming the zoological names of the animals in biosystematics.
2. Classify invertebrates by using different methods and can develop different cladogram and phylogram
3. Compare different systems in all phyla of nonchordates and compare it with evolutionary significance of it. They know about the transition occurred with time scale. They can explain digestive, respiratory, circulatory, excretory, reproductive and nervous system from Protozoa to Hemichordata.
4. find out distinguished mechanism of the different system function and the change in their mode of function if any throughout the invertebrate series
5. Identify various larval forms of invertebrates like of Porifera, coelenterate, helminthes, Annelida and Crustacea

Cos:

(1ZOO2) Animal Structure and Function (Chordata):

After learning this course, students would be able to.....

1. Describe different types of taxonomic characters and rules and operative principles of International Code of Zoological Nomenclature and designate zoological names.
2. Distinguish the endoskeletal system of Protochordates and Chordates and replacement of the cartilaginous structure by bones.
3. Study different systems throughout the vertebrate series as per their adaptations in different habitat and their successive modifications.
4. Explain structure and functioning of sense organs of mammals.
5. Learn migration avenues of Fishes and Birds, their types, benefits, routes, threats etc.

Cos :

1ZOO3: Gamete Biology:

After learning this course, students would be able to.....

1. Study spermatogenesis and oogenesis in eukaryotes.
2. Determine different events and their mechanisms during fertilization and its consequent changes.
3. Learn assisted reproduction techniques to overcome infertility.
4. Understand *Ex vivo* and *In vivo* gene therapy etc.
5. Learn about contraception and methods

1ZOO4: Genes and Differentiation:

After learning this course, students would be able to.....

1. Describe cell specification and differentiation in whole vertebrate series.
2. Study different body axis formation in *Drosophila*, Amphibia and Chick etc.
3. Learn about Human Aging and Senescence and factors affecting it.
4. Describe Biology of sex determination.
5. Study stem cells, their properties, types markers and disorders etc.

Cos

Upon completion of the course successfully, students would be able to

CO1:	Understand comprehensive anatomy of different systems of animals with available resources like C.D./chart/ models/ Video
CO1:	clippings/ PPT/ Preserved dissected specimens etc.
CO2:	Prepare permanent mountings of various material
CO3:	Collect photographs of the fauna of the local region or selected field
CO4:	Classify the specimen by the salient features they carry
CO5:	Compare the bones throughout the vertebrate series

COs:

Upon completion of the course successfully, students would be able to

COs	Description
CO1:	realize the importance of animal ethics in laboratories
CO2:	Compare the structural differences of the reproductive organs of male and female animals.
CO3:	Analyze the events of oogenesis and spermatogenesis through histological preparations
CO4:	Distinguish between the developmental/metamorphic events in the life cycle of frog, Chick and <i>Lymnea</i> .
CO5:	Count the sperms and analyse semen for fructose contents

Cos:

Upon completion of the course successfully, students would be able to

CO1:	Separate and determine molecular weights of protein by gelelectrophoresis.
CO2:	Prepare histochemical demonstration of lysosomes by acidphosphatase activity
CO3:	Prepare histochemical demonstration of DNA by Fuelgentechnique and DNA/RNA by MGPY Technique
CO4:	Prepare histochemical demonstration of carbohydrate by PASreaction
CO5:	Separate Amino acid by Paper chromatography.
CO6:	Investigate bacterial growth and different microbial preparations

Cos:

Upon completion of the course successfully, students would be able to

CO1:	study human hormonal disorders.
CO2:	Analyze parameters of different soil samples
CO3:	Analyze parameters of different water samples
CO4:	Calculate Diversity indices (Shannon, Simpson)
CO5:	Determine RQ
CO6:	Identify Freshwater Plankton from water samples
CO7:	Perform Qualitative analysis of Pollution indicators

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Cos:

2ZOO1: Molecular Cell Biology:

After learning this course, students would be able to.....

1. Understand and Compare Biomembranes and extracellular matrix.
2. Compare various type cell surface and intracellular receptors.
3. Analyse types of Cell Signalling pathways and Cell cycle control.
4. Describe cytoskeleton in the form of microfilaments and microtubules.
5. Determine secretory pathways in eukaryotic cells

COS

2ZOO2: Tools and Techniques in Biology

After learning this course, students would be able to.....

1. Apply principles and uses of techniques in Biology.
2. Find principles and applications of advanced microscopes and compare their uses.
3. Adopt different microbiological techniques.
4. Know cryotechniques and cryopreservation of cells, tissues and organisms.
5. Study Radioisotope and mass isotope techniques in biology.

CO's:

2ZOO3 Endocrinology

Upon completion of the course successfully, students would be able to

1. Study histology and histophysiology of different endocrine glands.
2. Study classification of hormones and their actions at cellular as well as genetic level.
3. Study regulation of the processes in organism by hormones.
4. Describe synthesis, transport and metabolism of steroid and nonsteroid hormones.
5. Study hormones of different endocrine glands and relative diseases.
6. Study hormone replacement therapy and neuroendocrine mechanisms in different animal.

Cos:

2ZOO4: Environment and Ecology:

Upon completion of the course successfully, students would be able to

1. Study environment and their biotic and abiotic interactions.
2. Describe population ecology in terms of diversity indices along with growth curves, demes and dispersal.
4. Describe environmental pollution and effects on nature, global warming global dimming.
5. Study conservation biology through sanctuaries, National parks, Project Tiger and Biosphere reserves.
6. Study toxicological effects of pesticides and remedial aspects of it.
7. Study Inter-Government Policy/Protocol for Climate change, Intellectual Property Rights and Environment Impact Assessment Processes.

Cos:

Upon completion of the course successfully, students would be able to

- CO1: separate and determine molecular weights of protein by gel electrophoresis.
- CO2: Prepare histochemical demonstration of lysosomes by acid phosphatase activity
- CO3: Prepare histochemical demonstration of DNA by Fielgen technique and DNA/RNA by MGPY Technique
- CO4: Prepare histochemical demonstration of carbohydrate by PAS reaction
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- CO7: Perform Qualitative analysis of Pollution indicators

MUNGASAJI MAHARAJ MAHAVIDYALAYA, DARWHA

Department of Chemistry-

B.Sc Chemistry

Programme Specific Outcomes, Course Outcomes

POs:

At the time of graduation, Students would be able to

PO1: Critical Thinking: Take informed actions after identifying the assumptions that frame our thinking and actions, checking out the degree to which these assumptions are accurate and valid, and looking at our ideas and decisions (intellectual, organizational, and personal) from different perspectives.

PO2: Effective Communication: Speak, read, write and listen clearly in person and through electronic media in English and in one Indian language, and make meaning of the world by connecting people, ideas, books, media and technology.

PO3: Social Interaction: Elicit views of others, mediate disagreements and help reach conclusions in group settings.

PO4: Effective Citizenship: Demonstrate empathetic social concern and equity centred national development, and the ability to act with an informed awareness of issues and participate in civic life through volunteering.

PO5: Ethics: Recognize different value systems including your own, understand the moral dimensions of your decisions, and accept responsibility for them.

PO6: Environment and Sustainability: Understand the issues of environmental contexts and sustainable development.

PO7: Self-directed and Life-long Learning: Acquire the ability to engage in independent and life-long learning in the broadest context socio-technological changes

Programme Specific Outcomes

PSO1: Understand the scope, methodology and application of modern chemistry.

PSO2: Apply theoretical and practical concepts of instruments that are commonly used-in most chemistry field.

PSO3: Plan and conduct scientific experiments and record the results of such experiments.

PSO4: Get acquainted with safety of chemicals, transfer, and measurements of chemicals, preparation

PSO5: Describe how chemistry is useful to solve social, economic and environmental problem and issues facing our society in energy, medicine, and health.

Course Outcomes

Course: Paper I

CO1: Describe periodic properties of elements; understand formation of ionic bonding & factors affecting ionic bond formation.

CO2: Understand electronic configuration, ionization energy, oxidation state of S and P block elements.

CO3: Identify electronic displacement taking place in the molecule by some effects, generation of reactive intermediates, the instability and reactions.

CO4: Interpret aromaticity and based on that distinguish aromatic, anti-aromatic and non-aromatic compounds, able to know the structure of benzene and its electrophilic substitution reaction.

CO5: Understand limitation of first law of thermodynamics and needs of second law of thermodynamic and know the concept of entropy.

CO6: Know the postulates of kinetic theory of gases, understand phase rule and application of phase rule on water system and sulphur system.

Course: Paper-II

CO1: Define polarization and its application, directional nature of covalent bond, concepts of hybridization and know the theory of acids and bases.

CO2: Understand requirement of good solvent and classification of solvents.

CO3: Describe synthesis and chemical reactions of alkylhalides, arylhalides and alcohol.

CO4: Understand methods of formation of phenols, ether and epoxide and their reactions catalyzed by acid and alkali.

CO5: Identify polar and non polar molecules and know paramagnetic and diamagnetic substances.

CO6: Describe rate of reaction in terms of change in concentration and how the rate of chemical reaction changes as a function of time.

Course: Paper III

CO1: Understand covalent bonding, metallic bonding and describe structure of molecule with regular & distorted geometry by using VSEPR theory and know about gravimetric and volumetric analysis.

CO2: Describe various reactions, acidity and reactivity involved in aldehydes ketone and carboxylic acid.

CO3: Identify importance of stereochemistry inorganic chemistry & apply the knowledge gained to a variety of chemical problems.

CO4: Define workfunction, Gibbs free energy and application of phase equilibria in miscible and immiscible liquids.

CO5: Understand determination of surface tension, viscosity and effects of temperature on surface tension and viscosity.

Course:Paper-IV

CO1: Understand chemistry of transition elements with reference to electronic configuration, atomic and ionic size, ionization energy and know about extraction of elements.

CO2: Define inner transition elements and know their properties and general principle of metallurgy.

CO3: Describe reactions of polynuclear hydrocarbon, synthesis of higher acids with the help of reactive methylene compounds, constitution of glucose, conversion of glucose to fructose etc.

CO4: Know synthesis of aromatic nitrocompounds, amino compounds and diazonium salts and their reactions.

CO5: Understand colligative properties of dilute solution and know to determination of molecular weight of solute.

CO6: Identity symmetry in crystal and elements of symmetry in crystals, also know the laws of symmetry.

Course:Paper-V

CO1: Understand key features of co-ordination compounds including variety of structures and know the concepts of oxidation number, coordination number, ligands, chelates and stability of complex.

CO2: Knowledge of crystal field theory to understand splitting in complexes and factors affecting in crystal field splitting.

CO3: Understand heterocyclic compound especially about their synthesis, reactivity and application of heterocyclic compound in advanced chemical synthesis.

CO4: Classify dyes on the basis of structure and mode of application, preparation and uses of dyes, drugs and pesticides.

CO5: Understand photochemical and thermal reactions by interaction of radiation with matter.

CO6: Identify the electric and magnetic properties of radiation and know the spectroscopic techniques for understanding the atomic structure and structure of molecule.

Course:Paper-VI

CO1: Understand thermodynamic and kinetic stability of complexes and geometry of complexes. Know about spectrophotometric technique for determination of concentration of metal ion. Define and classify chromatographic techniques.

CO2: Know basics of organometallic chemistry, inorganic polymers and bio-inorganic chemistry.

CO3: Identify structure of compound by use of electronic spectroscopy and infrared spectroscopy and know how to interpret spectra.

CO4: Understand the phenomena of Nuclear Magnetic Resonance spectroscopy and mass spectrometry.

CO5: Understand limitation of classical mechanics at molecular length scales and difference between classical and quantum mechanics.

CO6: Identify interconversions of chemical energy and electrical energy by knowing electrochemistry and application of radioisotopes in industry, agriculture, medicine & biosciences.

Course Outcome:- Chemistry

CO1 : Acquire knowledge about the importance of Chemistry in day to day life.

CO2 : Gain and understand knowledge about the course content in the Chemistry syllabus of three year B.SC.

CO3 : Develop the knowledge in the concept of Periodic Properties of Elements, Physical and Chemical behavior of compounds, Organic Compounds & their classification, Types of Reaction, State of matter, Thermodynamic & kinetic theory of gases etc

CO4 : Describe how to apply various phenomenon of Chemistry to Life

CO5 : Apply and evaluate Chemistry in Day to Day activities to find solutions of problem.

Credits: 5

1. Theory Periods of 48 minutes per day per week over a Semester.
2. Practical Periods of 2hrs 44mim.per day per week over a Semester.

Department of Chemistry-

Programme Outcomes, Programme Specific Outcomes, Course Outcomes

PG Chemistry

Programme Outcomes

PO1- Apply the subject knowledge to the solution of real-world problems

PO 2- Apply ethical principles and commit to professional ethics and responsibilities and norms of the standard practices.

PO3- Take informed actions after identifying the assumptions that frame our thinking and actions, checking out the degree to which these assumptions are accurate and valid, and looking at our ideas and decisions (intellectual, organizational, and personal) from different perspectives.

PO4- Identify, formulate, review research literature, and analyze complex problems reaching substantiated and innovative conclusions.

Design solutions for complex problems with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

Use research-based knowledge and research methods to provide valid conclusions.

Demonstrate the knowledge of, and need for sustainable development.

PO5- Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

Present/communicate research at national/international level, write effective articles, reports and design documentation, make effective presentations, and give and receive clear instructions.

Communicate disciplinary knowledge to the community and broader public.

PO6- Demonstrate personal accountability and effective work habits, e.g., punctuality, working productively with others, and time as well as workload management.

Demonstrate integrity and ethical behavior, act responsibly with the interests of the larger community in mind, and to learn from his/her mistakes.

Use the strengths of others to achieve common goals, and use interpersonal skills to coach and develop others.

Assess and manage his/her emotions and those of others; use empathetic skills to guide and motivate; and organize, prioritize, and delegate work.

PO7- Recognize the need for, and have the preparation and ability to engage in independent and lifelong learning in the broadest context of technological change.

PO8- Prepare well for living, learning and working in a Digital Society;

Create, select, and apply appropriate techniques, resources, and modern ICT tools to complex

activities with an understanding of the limitations.

Use existing digital technologies ethically and efficiently to solve problems, complete tasks, and accomplish goals.

Demonstrate effective adaptability to new and emerging technologies.

PO9- Act with an informed awareness of global issues.

Engage in initiatives that encourage equity and growth for all.

Chemistry

Programme Specific Outcomes

On completion of M.Sc. Chemistry programme, graduates would be able to:

PSO-1: observe, analyze and interpret chemical phenomena and process

PSO-2: design and develop new molecules/processes with industrial and societal applications

PSO-3: formulate new ideas/concepts in chemical sciences and test them

PSO-4: communicate effectively the principles and practice of chemical sciences

PSO-5: address issues of environment, health and development from a chemical perspective

PSO-6: follow professional ethics in all spheres of activity

PSO-7: function effectively as a member/leader in diverse teams/groups

PSO-8: engage in independent learning in the broadest context of scientific advancement

Course Outcomes

Chemistry

Paper I

Course Outcomes: At the end of the course students would be able to

1. predict the nature of bond and its properties through various electronic structural methods; bonding models
2. recognize and assign symmetry characteristics to molecules and objects,
3. understand and analyze structure-property correlation of coordination compounds
4. correlate magnetic properties of complexes with strength of ligand field
design new coordination compounds based on a fundamental understanding of their electronic properties
5. appreciate specialized and advanced topics in inorganic and coordination chemistry

6. Correlate structure and bonding with reactivity of boron clusters
7. analyze ligation of diatomic ligands with metals.

Paper II

Course Outcomes: At the end of the course students would be able to

1. Implement rules of aromaticity to organic molecules
2. Sketch organic molecules in different projection formula and assign its configuration.
3. Apply their understanding about the organic reactions of industrial significance with respect to the chemo-selectivity, regioselectivity and enantioselectivity.
4. Analyze the product distribution and the stereochemistry of various organic products.
5. Evaluate the organic reactions based on the influence of the substituents on substrate molecules
6. Design organic reactions in order to achieve the required product(s)

Paper III

Course Outcomes: At the end of the course students would be able to

1. Understand basic concepts and theories for quantum mechanics, surface chemistry, thermodynamics and electrochemistry
2. Apply the concepts of quantum mechanics to solve higher order problems associated with shapes, size and energy of atomic entities.
3. Develop the methodologies to identify and use colloidal substances and micelles.
4. Implement and build theoretical and experimental processes using thermodynamics and electrochemical concepts
5. Solve numerical problems associated with quantum mechanics, thermodynamics, and electrochemistry

Paper IV

Course Outcomes: At the end of the course students would be able to

1. Appraise specific analytical technique based on sample and target analyte
2. Develop analytical ability and critical thinking in selection of statistics and their use in making interpretation meaningful and productive.
3. Understand the principles of chromatographic techniques.
4. Select proper chromatographic technique among the available techniques.
5. Correlate the use of indicator used in different types of titration
6. Explore electroanalytical techniques based on conductance and emf measurements.
7. Design buffer systems of the required pH