



Hindi Vidya Prachar Samiti's
Ramniranjan Jhunjhunwala College
of Arts, Science & Commerce
(Empowered Autonomous College)
Affiliated to
UNIVERSITY OF MUMBAI

Syllabus for S.Y.B.Sc ZOOLOGY(under NEP)
Vertical under NEP: Open Elective Course (OEC)
To be offered to students from Arts and Commerce Faculty
SEMESTER: III

Title: INSIGHTS INTO ANIMAL WORLD

COURSE CODE: RJOECZOO231

(REVISED in 2024-2025 in alignment with the NEP 2020 facilitating the inter-and multidisciplinary learning and multiple entry and exit of the students)

(CBCS 2024-2025)

PREAMBLE

The National Education Policy 2020 aims at imparting skill-based learning and caters to the multiple entry and exit facility for the students thus empowering them to acquire knowledge at their pace. In the three-year UG program, the student has two exit options. Students also have the option of choosing the Honors program of four years study in a given discipline and later converting it to five-year integrated PG degree program. As an undergraduate student, he/she learns the core subject (Major), subject complementing the core subject (Minor), a course from other discipline (OEC or GEC) Vocational and Skill Enhancement course from the Major (VSEC). The remaining verticals under NEP 2020 are IKS (Indian Knowledge System), AEC (Ability Enhancement Course), VEC (Value Enhancement Course) and with progressive three years of UG, student also completes at different levels OJT (On Job Training), FP (Field Projects), CEP (Community Engagement Program), RP (Research Project) which helps him/her in understanding their roots, application of the knowledge for the benefit of self and the society. Vertical CC (Co-curricular activities and activities related to yoga and human well-being) helps in preparing youth with good character and interpersonal relationships.

The subject of Zoology offers the basic understanding about the vast diversity of the animal kingdom across the globe. It enables the students to strengthen their knowledge in Animal Sciences and in the other allied branches of Zoology. Keeping the interest of learner in mind, the syllabus has been carefully designed. It has a balance of the classical aspects of Zoology which includes topics like taxonomy, ecology, ethology, developmental biology, physiology, fishery science. The syllabus also includes applied subjects like biochemistry, pathology, immunology.

The undergraduate curriculum has been meticulously designed by considering the need for the subject development, industry requirement, research outlook, competitive exams and entrepreneurship skills. Each unit included in the syllabus has clearly defined objectives. It focuses on outcome-based learning. It aims at inculcating the critical thinking, enhancing the analytical ability, developing writing skills of the students. The syllabus includes field trips to ecological habitats, national parks, sanctuaries, natural history museum, reputed research institutes and industries to widen the student's horizon. The students are encouraged to participate in various project-based activities.

Owing to the current needs of the industry and other sectors, the syllabi is designed in a manner that the learner will be able to apply the knowledge and skills acquired in varied fields. The course encourages a sense of responsibility and empathy towards all living beings, promoting sustainable practices in the learner.

PROGRAMME OUTCOMES (PO) OF UNDERGRADUATE DEGREE PROGRAMMES

Program outcome refers to the overall characteristic an individual is supposed to acquire on completion of the three-year degree program in Bachelor of Science. The attributes based on acquisition, accumulation, and processing of knowledge of the subject are transferable beyond the discipline and useful in different domains of life.

Critical Thinking: Concepts, methodology and ability to formulate questions stimulate the inquisitiveness and critical thinking amongst the students.

Scientific Temperament: The nurturing of the young minds to observe and analyse the experiments in the laboratory or a phenomenon occurring around them to obtain a logical scientific explanation for it.

Analytical Thinking: The ability to think analytically can be developed by training and practice. The syllabus offers the student to understand the concept and design projects or experiments based on them.

Domain knowledge: The domain knowledge is the key to the understanding of advances and complex subject matter.

Social Ethics: The students are exposed to different problems caused due to human activity. They learn to conduct themselves without creating a damage to fellow beings.

Animal Ethics: The sensitization towards ethical issues associated with use of animals in the laboratory is highlighted and the solutions to overcome it are introduced.

Problem Solving: The ability to handle a situation is enhanced in the students by problem solving assignments, case studies, projects to make them competent, conscious and creative individual.

Environmental Sustainability: Environment related issues are addressed through workshops, Guest lectures and field studies.

PROGRAMME SPECIFIC OUTCOMES (PSOS)-BSc PROGRAMME IN ZOOLOGY

PSO1	Understands the nature and basic concepts of systematic classification, ecology, biomolecules, animal biotechnology, cell biology and genetics.
PSO2	Analyse and comprehend the concepts of Enzymology, developmental biology, histology and molecular biology. Acquaint with the skills in fishery biology, medical diagnostics and environment management to boost entrepreneurship skills.
PSO3	Acquire skills and necessary training for techniques in haematology, immunology, physiology, endocrinology, enzymology, molecular biology, toxicology and field biology. Enhance knowledge on biostatistics, bioinformatics, Wild-life tourism and epidemiology to provide wider job prospects in the realm of Zoology.
PSO4	Perform laboratory procedures as per standard protocols in the areas of animal diversity, genetics, biochemistry, molecular biology, physiology, immunology, developmental biology, environmental biology and ethology.
PSO5	Apply ethical principles and knowledge in understanding of Zoology to one's own life and work. Applications of biological sciences in different areas that contributes towards Nation building.

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S.Y.B.Sc NEP Zoology Open Elective Course Syllabus Semester-III & IV

SEMESTER	:	III
TITLE OF THE SUBJECT/COURSE	:	INSIGHTS INTO ANIMAL WORLD
COURSE CODE	:	RJOECZOO231
CREDITS	:	03
DURATION	:	45 Hours

LEARNING OBJECTIVES	
1	To introduce learner to interesting, exotic animals.
2	To understand the basic concepts of animal behaviour.
3	To introduce learners to various canine and feline pets ,their handling ,nutrition and health.

COURSE OUTCOMES	AFTER COMPLETING THE COURSE, THE LEARNER WILL BE ABLE TO:	PSO ADDRESSED	BLOOM'S TAXONOMY LEVEL
CO1	Appreciate the uniqueness of animals and their wonderful features	1,3 &4	BT level 1&2 Describe and identify
CO2	Comprehend the nuances of different types of innate, learned and protective animal behaviour	3 &4	BT level 2,3 Understand and apply
CO3	Understand various modes of animal communication	3 &4	BT level 2,3 Understand and apply
CO4	Fathom the contribution of pets to the physical, mental, and emotional well-being of a pet owner	3,4,5	BT level 2,3 Identify and apply
CO5	Grasp handling, nutrition and diseases and treatment considering pets from the canine and feline family.	3 &4	BT level 2,3 Understand and apply

SEMESTER III		
OPEN ELECTIVE COURSE: INSIGHTS INTO ANIMAL WORLD (Theory)	HRS	Credits
PAPER CODE: RJOECZOO231	45	03
UNIT I: AMAZING ANIMALS		
1.1 Noctiluca, Mantis shrimp, Black widow spider, Octopus 1.2 Clown fish, Strawberry poison dart frog, Komodo dragon. 1.3 Lyre bird, Kakapo, Cheetah, Reindeer and Sperm whale		
UNIT II: ANIMAL BEHAVIOUR		
2.1 Definition and scope of study 2.2 Innate behaviour and Learned behaviour with examples 2.3 Protective behaviour (Camouflage, Warning coloration and mimicry) 2.4 Animal communication- Visual (gestures and postures in animals), Auditory (animal calls and signals), Chemical (scent signals)		
UNIT III: PET CARE AND MANAGEMENT		
3.1 Common pet animals, Exotic Pets, significance of pet keeping. Careers in pet care. 3.2 Canine pets and Feline pets: Popular breeds, General nutritional requirements, behaviour patterns, common diseases. 3.3 Grooming and vaccination, sterilisation for dogs and cats. Case Study: Animal adoption – rules and regulations. Pets in Psychotherapy		

REFERENCES

1. The ABCs of Living with Dogs: Care and Training Resources, Sherry Woodard
2. Control of Vector Borne Diseases in Dogs and Cats, ESCCAP Guidelines, 5th ed. 2023
3. Animal Behaviour, V.K Agarwal, S. Chand Publication

SEMESTER -III
OEC EVALUATION PATTERN
COURSE CODE: RJOECZOO231

(Based on the centralized guidelines given by EC under NEP2020)

Evaluation: Theory Based

Internal Evaluation : 25 marks

- Assignment: 20 marks
- Class participation: 05 marks.

External- Semester End Evaluation: Project Report / Assignment : 50marks

Q1. MCQ: 10 marks

Q2. Match the column: 05 marks.

Q3. True or False: 05 marks

Q4. Complete the analogy: 05 marks

Q5. Fill in the blanks : 05 marks

Q6. Answer in one sentence: 05 marks.

Q7. Write short notes (based on unit I, II, III): 15 marks

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Mapping of the course to Local/ Regional/National/International relevance

Class	Course Name	Course Code	Local relevance	Regional relevance	National relevance	International relevance
S Y B Sc Open elective to be offered to students of Arts and Commerce faculty	Insights into Animal World	RJOECZOO231	The knowledge to deal with canine and feline pets and their importance in human society.	The knowledge of animals will help in understanding their behaviour and suitable region required for their growth	Gain knowledge of exotic animal species, their behaviour.	Gain knowledge of exotic animal species, their behaviour. The knowledge to deal with canine and feline pets and their importance in human society

Mapping of the course to Employability/ Entrepreneurship/Skill development

Class	Course Name	Course Code	Topic focusing on Employability/ Entrepreneurship/skill development	Employability/Entrepreneurship/Skill development	Specific activity
S Y B Sc Zoology OEC to be offered to students from Arts and Commerce faculty	Insights into Animal World	RJOECZOO231	Pet Care and Management	Entrepreneurship skills	Skills for pet management and care

Integration of Cross-cutting Issues

Class	Course Code	Cross Cutting Issues
S Y B Sc Zoology OEC to be offered to students from Arts and Commerce faculty	RJOECZOO231	Ethics, UNSDG 4, 8, 15 NEP2020 Interdisciplinary/Multidisciplinary

SEMESTER IV



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Vertical under NEP: Open Elective Course (OEC)
To be offered to students from Arts and Commerce Faculty
SEMESTER IV

Title: ENVIRONMENT AND ITS MANAGEMENT

COURSE CODE: RJOECZOO241

(REVISED in 2024-2025 in alignment with the NEP 2020 facilitating the inter-and multidisciplinary learning and multiple entry and exit of the students)

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S.Y.B.Sc NEP Zoology Open Elective Course Syllabus Semester-III & IV

SEMESTER	:	IV
TITLE OF THE SUBJECT/COURSE	:	ENVIRONMENT AND ITS MANAGEMENT
COURSE CODE	:	RJOECZOO241
CREDITS	:	03
DURATION	:	45 Hours

LEARNING OBJECTIVES	
1	To understand the patterns in global climate change and its impact
2	To get an insight on the disasters and their management.
3	To introduce learners to various aspects of ecotourism.

COURSE OUTCOMES	AFTER COMPLETING THE COURSE, THE LEARNER WILL BE ABLE TO:	PSO ADDRESSED	BLOOM'S TAXONOMY LEVEL
CO1	Comprehend the impact of global climate change	1, 3 & 4	BT level 2, 3 & 5 Understand, Apply & evaluate
CO2	Understand the need for immediate action to combat climate change.	3, 4 & 5	BT level 2,3 Understand and apply
CO3	Understand various disasters and their management	3 & 4	BT level 2,3 Understand and apply
CO4	Comprehend the significance of ecotourism in sustainable development.	3, 4 & 5	BT level 2,3 and 6 Understand, apply & create

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SEMESTER IV		
OPEN ELECTIVE COURSE: ENVIRONMENT AND ITS MANAGEMENT ((Theory)	HRS	Credits
PAPER CODE: RJOECZOO241	45	03
UNIT I: RECENT TRENDS IN CLIMATE CHANGE		
1.1 Introduction to climate change, global warming and its effects. 1.2 Greenhouse substances: Sources & effects. 1.3 Remote Sensing & GIS. 1.4 Role of IPCC in climate change monitoring; Earth Summit & UN Convention on Climate Change, Kyoto Protocol, Montreal Protocol. 1.5 Case studies: Climate change and apple farming in Indian Himalayas, The case of ozone depletion		
UNIT II: DISASTER MANAGEMENT		
2.1 Introduction and Types of Disasters 2.2 Disaster prone regions of India 2.3 Impact of disasters 2.4 Floods, Earthquakes & Cyclones: causes, effects and control measures. Case studies: Major Disasters in India		
UNIT III: ECOTOURISM		
3.1 Concept of Ecotourism: Definition ,History and scope of Social and ecological impacts of tourism 3.2 Types of Ecotourism: Agro Ecotourism, Geo Ecotourism, Cultural Ecotourism-tangible and intangible heritages 3.3 Ecotourism resources in India: Ecoregions, Vegetation types, protected areas; endemism and biodiversity hotspots, Historical monuments. Case Study: Thenamala, Govardhan Eco village Rustic Holiday,		

REFERENCES

1. Environmental Science, S.C. Santra, New Central Book Agency (P) Ltd. 2001.
2. Global Environmental Issues – A Climatological Approach, David D. Kemp, Roulte Ledge & Company, London & N. Y. 1990.
3. Ecotourism, Ecorestoration & Development, Solomon Raju, New Central book agency, 2007.
4. Introduction to Climatology for the Tropics, J.O. Ayoade, J. Wiley & Sons 1983.

SEMESTER -IV

OEC EVALUATION PATTERN

COURSE CODE: RJOECZOO241

(Based on the centralized guidelines given by EC under NEP 2020)

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Internal Evaluation : 25 marks

- Assignment: 20 marks
- Class participation: 05 marks.

External- Semester End Evaluation Project Report / Assignment : 50marks

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Q3. True or False: 05 marks

Q4. Complete the analogy: 05 marks

Q5. Fill in the blanks : 05 marks

Q6. Answer in one sentence: 05 marks.

Q7. Write short notes (based on unit I, II, III): 15 marks

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Mapping of the course to Local/ Regional/National/International relevance

Class	Course Name	Course Code	Local relevance	Regional relevance	National relevance	International relevance
S Y B Sc Open elective to be offered to students of Arts and Commerce faculty	Environment and its management	RJOECZOO241	The knowledge to deal with climate change at local level, local disasters.	The knowledge of animals will help in understanding the patterns of global warming and disasters occurring in specific regions.	Gain knowledge of India's climate change, disasters and ecotourism practises.	Insights to global climate change and its impact.

Mapping of the course to Employability/ Entrepreneurship/Skill development

Class	Course Name	Course Code	Topic focusing on Employability/ Entrepreneurship/skill development	Employability/Entrepreneurship/Skill development	Specific activity
S Y B Sc Zoology OEC to be offered to students from Arts and Commerce faculty	Environment and its management	RJOECZOO241	Climate change monitoring, Management of disasters, Ecotourism practises and resources	Skill to work with disaster relief teams, Develop ecotourism start up. Work as guide at ecotourism destinations	Skills for disaster management and ecotourism practises

Integration of Cross-cutting Issues

Class	Course Code	Cross Cutting Issues
S Y B Sc Zoology OEC to be offered to students from Arts and Commerce faculty	RJOECZOO241	Ethics, Environment and sustainability UNSDG 4, 11, 13, 15 NEP2020 Interdisciplinary/Multidisciplinary