Yogoda Satsanga Mahavidyalaya
JAGANNATHPUR, DHURWA, RANCHI – 834004
Email address: ysmranchi4@gmail.com
(NAAC Accredited, Grade: B++, CGPA: 2.89)

Course plan

NAME OF THE DEPARTMENT: Zoology

NAME OF THE FACULTY: Dr. Rakhee Lohia

ACADEMIC SESSION: August 2022

YEAR: 2022

PROGRAM: B. Sc./ B.Com

SEMESTER: II

COURSE TYPE: AECC

COURSE: Environment Studies

COURSE CODE: AECC

TOTAL CREDIT:

Program Outcomes (POs):

Student should be able to,

PO1- Apply the knowledge and concepts of biology and its fundamental principles and to identify, analyze and find solutions to various biological problems.

PO2- Identity, hypothesize, and review available research literature, and analyze complex biological issues reaching substantiated conclusions using knowledge of biodiversity, environment, and biological functioning.

PO3- Develop scientific temperament, an ability to merge, interconnect and extrapolate information and knowledge across various streams.

PO4- Ability to decide appropriate technology and tools to solve problems. Understand the availability, of resources, their judicious use, and the execution of the project in sustainable way.

PO5- Design solutions for complex scientific problems and design processes that meet the specified needs with appropriate consideration for public health & safety, cultural, societal, legal, constitutional and environmental considerations.

PO6- Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO7- Communicate effectively on complex scientific activities with the science community and with society at large, such as, being able to comprehend and write effective reports and design documents, make effective presentations, and give and receive clear instructions.

PO8- Demonstrate knowledge and understanding of the scientific principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO9- Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of scientific developments, technological advancements and global changes.

PO10- Value and foster Physical, Physiological and Psychological well-being through personal practice and conduct. Ability to apply the learnings for a lifelong commitment to ethics in fulfilment of professional and social obligations.

PO11- Apply academic learning to promote higher studies, sustainable living through employment, and initiation of entrepreneurial advent to create opportunities and wealth for self and society.

PO12- Value and support social causes and rural development through service and philanthropic activities.

PROGRAM-SPECIFIC OUTCOMES (PSOs):

Student should be able to,

PSO1: An ability to demonstrate in-depth knowledge and understanding of the fundamental concepts, principles, and processes underlying the academic field of Zoology and its different subfields like animal diversity, principles of ecology, comparative anatomy and developmental biology of vertebrates, physiology, endocrinology, biochemistry, genetics, and evolutionary biology, animal biotechnology, applied Zoology, aquatic biology, immunology, reproductive biology, parasitology, entomology, apiculture, aquarium fish keeping, medical diagnostics, and sericulture.

PSO2: Development of procedural knowledge and merging it with the advanced techniques available to create different types of professionals in the field of Zoology and related fields such as Apiculture, Fisheries, Medical Diagnostics, Sericulture, Paleozoology, Ornithology, Herpetology, Forensics, Bioinformatics, and Arachnology.

PSO3: Understand and appreciate the complexity of life processes, their molecular, cellular, and physiological processes, their genetics, evolution, and behavior, and their interrelationships with the environment.

COURSE OUTCOMES (COs):

CO1: Define the concept of a sustainable environment and its benefits.

CO2: Learn about biodiversity, national parks, extinct and endangered species, different practices of poaching, and different methods of bio conservation.

CO3: Aware of renewable and non-renewable resources, develop the wisdom to use resources judiciously, compare the different alternative resources, and provide a critical evaluation.

CO4: Aware of pollution, criticism of various polluting agents, their effective preventive measures, and able to innovate new practices.

CO5: Aware of various environmental policies, their implications, challenges, and repercussions.

CO6: Evaluate and Design the various sustainable practices and choose healthy practices at the micro level.

Correlation between POs and COs

POs → COs ↓	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2	PSO3	PSO4	PSO5
CO1														
CO2														
CO3														
CO4														
CO5														

1. Weak **2. Moderate** **3. Strong**

Course teaching and learning activities

A. PEDAGOGY

i. **Whiteboard**
ii. **Flipped Class**
iii. **PPT**
iv. **Debate**
v. **Group Discussions**

B. COURSE COMPLETION PLAN

UNIT	NO. OF LECTURES			TEST	QUIZ	ASSIGNMENT
	THEORY	PRACTICAL	TUTORIAL			
1						
2						
3						
4						
5						
6						

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COURSE DELIVERY PLAN:

UNIT	TOPIC/SUBTOPIC	LECTURE REQUIRED	CO ADDRESSED	ASSIGNMENT/ TEST/QUIZ
1	Introduction to environmental studies Multidisciplinary nature of environmental studies; Scope and importance; Concept of sustainability and sustainable development.			
2	Ecosystems What is an ecosystem? Structure and function of ecosystem; Energy flow in an ecosystem: food chains, food webs and ecological succession. Case studies of the following ecosystems : Forest ecosystem, Grassland ecosystem, Desert ecosystem, Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)			
3	Natural Resources : Renewable and Non-- renewable Resources Land resources and landuse change; Land degradation, soil erosion and desertification. Deforestation: Causes and impacts due to mining, dam building on environment, forests, biodiversity and tribal populations. Water : Use and over-- exploitation of surface and ground water, floods, droughts, conflicts over water (international & inter-- state). Energy resources : Renewable and non renewable energy sources, use of alternate energy sources, growing energy needs, case studies.			
4	Biodiversity and Conservation Levels of biological diversity : genetic, species and ecosystem diversity; Biogeographic zones of India; Biodiversity patterns and global biodiversity hot spots India as a mega-- biodiversity nation; Endangered and endemic species of India Threats to biodiversity : Habitat loss, poaching of wildlife, man-- wildlife conflicts, biological invasions; Conservation of biodiversity : In-- situ and Ex-- situ conservation of biodiversity. Ecosystem and biodiversity services: Ecological, economic, social, ethical, aesthetic and Informational value.			
5.	Environmental Pollution Environmental pollution : types, causes, effects and controls; Air, water, soil and			

	noise pollution Nuclear hazards and human health risks, Solid waste management : Control measures of urban and industrial waste. Pollution case studies.			
6.	Environmental Policies & Practices Climate change, global warming, ozone layer depletion, acid rain and impacts on human communities and agriculture Environment Laws: Environment Protection Act; Air (Prevention & Control of Pollution) Act; Water (Prevention and control of Pollution) Act; Wildlife Protection Act; Forest Conservation Act. International agreements: Montreal and Kyoto protocols and Convention on Biological Diversity (CBD). Nature reserves, tribal populations and rights, and human wildlife conflicts in Indian context.			
7.	Human Communities and the Environment Human population growth: Impacts on environment, human health and welfare. Resettlement and rehabilitation of project affected persons; case studies. Disaster management : floods, earthquake, cyclones and landslides. Environmental movements : Chipko, Silent valley, Bishnois of Rajasthan. Environmental ethics: Role of Indian and other religions and cultures in environmental conservation. Environmental communication and public awareness, case studies (e.g., CNG vehicles in Delhi).			
8.	Field work Visit to an area to document environmental assets: river/ forest/ flora/fauna, etc. Visit to a local polluted site--Urban/Rural/Industrial/Agricultural. Study of common plants, insects, birds and basic principles of identification. Study of simple ecosystems-- pond, river, Delhi Ridge, etc.			

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A. COURSE OUTCOME ASSESSMENT PLAN

a. DIRECT ASSESSMENT

(Please tick the appropriate column)

COURSE OUTCOME	ASSESSMENT				REMARKS
	QUIZ	TEST	MID SEMESTER	END SEMESTER	
CO1					
CO2					
CO3					
CO4					
CO5					

b. INDIRECT ASSESSMENT (STUDENT SURVEY)

Name of the Student:
University Roll no/ Class roll no.:
Name of the Programme:
Semester and Session:
Course and Course Code:

Rate the following aspects of course outcomes. Use the scale 1-3

S. No	Course Outcome	1	2	3
1.	CO1			
2.	CO2			
3.	CO3			
4.	CO4			
5.	CO5			

1. Average
2. Good
3. Very Good

B. REMEDIAL CLASSES

S.NO.	ROLL. NO. & SESSION	NAME OF THE STUDENT	MARKS OF MID SEM /CLASS TEST	REMEDIAL CLASSES HELD			END SEM EXAM	IMPROVEMENT (Y/S)
				DATE	TIME	MODE		

C. SUGGESTED READINGS

a. Raziuddin, M.., Mishra P.K. 2014, *A Handbook of Environmental Studies*, Akanaksha Publications, Ranchi.

b. Mukherjee, B. 2011: *Fundamentals of Environmental Biology*.Silverline Publications, Allahabad.

c. Carson, R. 2002. *Silent Spring*. Houghton Mifflin Harcourt.

d. Gadgil, M., & Guha, R.1993. *This Fissured Land: An Ecological History of India*. Univ. of California Press.

e. Gleeson, B. and Low, N. (eds.) 1999.*Global Ethics and Environment*, London, Routledge.

f. Gleick, P. H. 1993. *Water in Crisis*. Pacific Institute for Studies in Dev., Environment & Security. Stockholm Env. Institute, Oxford Univ. Press.

g. Groom, Martha J., Gary K. Meffe, and Carl Ronald Carroll.*Principles of Conservation Biology*. Sunderland: Sinauer Associates, 2006.

h. Grumbine, R. Edward, and Pandit, M.K. 2013. Threats from India's Himalaya dams. *Science*, 339: 36-- 37.

i. McCully, P. 1996. *Rivers no more: the environmental effects of dams*(pp. 29-- 64). Zed Books.

j. McNeill, John R. 2000. Something New Under the Sun: An Environmental History of the Twentieth Century.

k. Odum, E.P., Odum, H.T. & Andrews, J. 1971.*Fundamentals of Ecology*. Philadelphia: Saunders.

l. Pepper, I.L., Gerba, C.P. & Brusseau, M.L. 2011. Environmental and Pollution Science. Academic Press.

m. Rao, M.N. & Datta, A.K. 1987. *Waste Water Treatment*. Oxford and IBH Publishing Co. Pvt. Ltd.

n. Raven, P.H., Hassenzahl, D.M. & Berg, L.R. 2012.*Environment*. 8th edition. John Wiley & Sons.

o. Rosencranz, A., Divan, S., & Noble, M. L. 2001. *Environmental law and policy in India*. *Tripathi 1992*.

p. Sengupta, R. 2003. *Ecology and economics*: An approach to sustainable development. OUP.

q. Singh, J.S., Singh, S.P. and Gupta, S.R. 2014. *Ecology, Environmental Science and Conservation*. S. Chand Publishing, New Delhi.

r. Sodhi, N.S., Gibson, L. & Raven, P.H. (eds). 2013. *Conservation Biology*: *Voices from the Tropics*. John Wiley & Sons.

s. Thapar, V. 1998. *Land of the Tiger*: *A Natural History of the Indian Subcontinent*.

t. Warren, C. E. 1971. *Biology and Water Pollution Control*. WB Saunders.

u. Wilson, E. O. 2006.*The Creation: An appeal to save life on earth*. New York: Norton.

v. World Commission on Environment and Development. 1987. *Our Common Future*. Oxford University

a. TEXT BOOKS

b. REFERENCE BOOKS

c. VIDEO RESOURCE

d. WEB RESOURCES:-

e. E-RESOURCES