DEPARTMENT OF ZOOLOGY

COURSE CURRICULUM & MARKING SCHEME

B.Sc. Part - III

ZOOLOGY

SESSION : 2023-24

ESTD : 1958

GOVT. V.Y.T. PG AUTONOMOUS COLLEGE, DURG, 491001 (C.G.)

(Former Name – Govt. Arts & Science College, Durg)

NAAC Accredited Grade A+, College with CPE - Phase III (UGC), STAR COLLEGE (DBT)

Phone : 0788-2212030

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In case of any change or modification is prescribed by central board of studies of Higher Education Department, Government of Chhattisgarh with respect to content or distribution of marks for undergraduate syllabi, it will be implemented accordingly.

GOVT. V.Y.T. PG. AUTONOMOUS COLLEGE DURG
DEPARTMENT OF ZOOLOGY
SESSION 2023-24
Learning Outcome Based curriculum for B. Sc. Zoology

Program Specific Outcome (PSO): B. Sc. Zoology

The programme enables the students to:

- Acquire knowledge on the various aspects of life sciences, cell biology, genetics, taxonomy, physiology, applied zoology, general embryology and public health.
- Understand good laboratory practices and safety, carry out experimental techniques and methods of Physiology, Cell biology, pathology, Genetics, Applied Zoology, Biological techniques, Toxicology,Entomology, Sericulture, Biochemistry, microtomy.
- Understand the applications of biological sciences in Biotechnology, Apiculture, Poultry, Fisheries, Aquaculture, Agriculture and vermiculture.
- Gained the knowledge to use modern sophisticated equipment and tools.
- Recognize the scientific facts behind natural phenomena.

GOVT. V.Y.T. PG. AUTONOMOUS COLLEGE DURG
DEPARTMENT OF ZOOLOGY
B.Sc. III

Approved syllabus for B. Sc. III by the members of Board of Studies for theSession 2023- 24
The syllabus with the paper combinations is as under

B.Sc. III:

Course Code – BZO05 Paper I: ECOLOGY, ENVIRONMENTAL BIOLOGY, TOXICOLOGY, MICRO BIOLOGY AND MEDICAL ZOOLOGY	Course Code – BZO06 Paper II: GENETICS, CELL PHYSIOLOGY, BIOCHEMISTRY, BOITECHNOLOGY AND BIOTECHNIQUES
BZOL 03, Lab Course I/ Practical: LAB COURSE	

The syllabus for B.Sc. is hereby approved for the session 2023-24

Name and Signatures

Chairperson /H.O.D	Departmental members 1. .....
University Nominee	2. .....
Subject Expert	3. .....
Subject Expert	4. .....
Representative from Industry/entrepreneur	5. .....
Student representative	6. .....
Other Prof. from Science faculty	7. .....
	8. .....

DEPARTMENT OF ZOOLOGY

Syllabus and Marking Scheme for B.Sc. III

Session 2023-24

Paper No.	Title of the Paper	Marks Allotted in Theory	
		Max	Min
I	BZO05/ECOLOGY, ENV. BIOLOGY, TOXICOLOGY, MICRO BIOLOGY ANDMEDICAL ZOOLOGY	50	17
II	BZO06/GENETICS, CELL PHYSIOLOGY, BIOCHEM., BIOTECH.,& BIOTECHNIQUE	50	17
III	BZOL03, LAB COURSE	50	17
	Total	150	

02 Theory papers - 100

01 Practical - 50

Total Marks - 150

The syllabus and marking scheme for B. Sc. III is hereby approved for the session 2023-24

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	8. .....

Govt. V. Y.T. PG Autonomous College, Durg

B.Sc. III

ZOOLOGY

Session 2023-24

Paper I

Course Code – BZO05

ECOLOGY, ENVIRONMENTAL BIOLOGY, TOXICOLOGY, MICROBIOLOGY AND MEDICAL ZOOLOGY

Max. M. 50

Min. M. 17

Unit: I (Ecology)

- Aims and scopes of ecology
- Major ecosystems of the world-Brief introduction
- Population- Characteristics and regulation of densities
- Communities and ecosystem
- Bio-geo chemical cycles
- Air & water pollution
- Ecological succession

Unit: II (Environmental Biology)

- Laws of limiting factor
- Food chain in fresh water ecosystem
- Energy flow in ecosystem- Trophic levels
- Conservation of natural resources
- Environmental impact assessment

Unit: III (Toxicology)

- Definition and classification of Toxicants
- Basic Concept of toxicology
- Principal of systematic toxicology
- Heavy metal Toxicity (Arsenic, Mercury, Lead, Cadmium)
- Animal poisons- snake venom, scorpion & bee poisoning
- Food poisoning

Unit: IV (Microbiology)

- General and applied microbiology
- Microbiology of domestic waste and sewage
- Microbiology of milk & milk products
- Industrial microbiology: fermentation process, production of penicillin, alcoholic beverages, bioleaching.

Unit: V (Medical Zoology)

- Brief introduction to pathogenic microorganisms, Ricketssia, Spirochaetes, AIDS and Typhoid
- Brief account of life history & pathogenicity of the following pathogens with reference to man: prophylaxis &treatment
- Pathogenic protozoan's- Entamoeba, Trypanosome & Plasmodium
- Pathogenic helminthes- Schistosoma
- Nematode pathogenic parasites of man
- Vector insects

- Nematode pathogenic parasites of man
- Vector insects

Course Outcomes

After successful completion the student would be able:

- To understand the basic theories and principles of ecology, ecosystems and their functioning
- To be aware of toxicants, their impacts on environment and remedial measures
- To understand the microbial world, its structure and function and to familiarize with theapplied aspects of microbiology
- To make them aware of the pathogens, health related problems, their origin and treatment

Reference books

- Unified Zoology by Saxena.
- Ecology and Environment by P. D. Sharma.
- Toxicology by Sood.
- Parasitology by K. D. Chatterjii.
- Unified zoology- Yugbodh Prakashan.

The syllabus for B.Sc. III paper I is hereby approved for the session 2023-24

Name and Signatures

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Govt. V.Y.T.P.G. Autonomous College, Durg

B.Sc. III

ZOOLOGY

Session 2023-24

Paper II

Course Code – BZO06

GENETICS, CELL PHYSIOLOGY, BIOCHEMISTRY, BIOTECHNOLOGY AND BIOTECHNIQUES

Max. M. 50

Min. M. 17

Unit: I (Genetics)

- Linkage & linkage maps, Sex Determination and Sex Linkage
- Gene interaction- Incomplete dominance & Codominance, Supplementary gene, Complementary gene,Epistasis Lethal gene, Pleiotropic gene and multiple alleles.
- Mutation: Gene and chromosomal mutation
- Human genetics: chromosomal alteration: Down, Edward, Patau, Turner and Klinefelter Syndrome Singlegene disorders: Alkaptonuria, Phenylketonuria, Sickle cell anemia, albinism and colour blindness

Unit: II (Cell Physiology)

- General idea about pH & buffer
- Transport across membrane: Diffusion and Osmosis
- Active transport in mitochondria & endoplasmic reticulum
- Enzymes-classification and Action

Unit: III (Biochemistry)

- Amino acids & peptides- Basic structure & biological function
- Carbohydrates & its metabolism- Glycogenesis; Gluconeogenesis; Glycolysis; Glycogenolysis; Cosi-cycle
- Lipid metabolism- Oxidation of glycerol; Oxidation of fatty acids
- Protein Catabolism- Deamination, transamination, transmethylation

Unit: IV (Biotechnology)

- Application of Biotechnology
- Recombinant DNA & Gene cloning
- Cloned genes & other tools of biotechnology (Tissue culture, Hybridoma, Transgenic Animals and Genelibrary)

Unit: V (Biotechniques)

Principles & techniques about the following:

- pH meter
- Colorimeter
- Microscopy- Light microscopes: Compound, Phase contrast & Electron microscopes
- Centrifuge
- Separation of biomolecules by chromatography & electrophoresis

Course Outcomes

After successful completion the student would be able:

- To get an in depth understanding of human genetics and genetic disorders
- To develop critical thinking, skill and research aptitude in the frontier areas of the biochemistry and biotechnology
- To understand the basic principle and applications of analytical and separation techniques.

Reference book:

- Unified Zoology by Dr. S. M. Saxena.
- Genetics and Developmental Biology by Veerbala Rastogi.
- Animal Physiology and Biochemistry by S. P.Mishra.
- Tools and Technique by P. K. Bajpayee.

The syllabus for B.Sc. III year paper II is hereby approved for the session 2023-24

Name and Signatures

Chairperson /H.O.D	Departmental members
University Nominee	1. .....
Subject Expert	2. .....
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Govt. V.Y.T. PG Autonomous College, Durg
B.Sc. III
ZOOLOGY
Session 2023-24
BZOL03, Lab. Course

The practical work in general shall be based on syllabus prescribed in theory. The candidates will be required to showknowledge of the following:

- Estimation of population density, percentage frequency, relative density.
- Analysis of producers and consumers in grassland.
- Detection of gram-negative and gram-positive bacteria.
- Blood group detection (A, B, AB, O)
- R. B. C. and W.B.C count
- Blood coagulation time
- Preparation of hematin crystals from blood of rat
- Observation of Drosophila, wild and mutant.
- Chromatography-Paper or gel.
- Colorimetric estimation of Protein.
- Mitosis in onion root tip.
- Biochemical detection of Carbohydrate, Protein and Lipid.
- Study of permanent slides of parasites, based on theory paper.
- Working principles of pH meter, colorimeter, centrifuge and microscope.

Scheme of marks distribution

Time: 3:30 hrs.

- Hematological Experiment 08
- Ecological Experiment: Grassland Ecosystem/ 06
- Population Density/Frequency/relative density
- Bacterial staining 05
- Biochemical experiment 06
- Practical based on Instrumentation (Chromatography/ pH meter/microscope/centrifuge. 05
- Spotting (5 spots) 10
- Viva 05
- Sessional 05

Course Outcomes

After successful completion the student would be able:

- To develop critical thinking, skill and research aptitude in the frontier areas of the biochemistry and biotechnology
- To understand the basic principle and applications of analytical and separation techniques.
- To understand the basic theories and principles of ecology, ecosystems and their functioning
- To be aware of toxicants, their impacts on environment and remedial measures
- To understand the microbial world, its structure and function and to familiarize with theapplied aspects of microbiology
- To make them aware of the pathogens, health related problems, their origin and treatment

The syllabus for B.Sc. III practical is hereby approved for the session 2023-24

Name and Signatures

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	7. .....
	8. .....

DIRECTIVES FOR STUDENTS, FACULTY AND EXAMINERS

1. There shall be three sections (Section A, B, and C) in each theory paper.
2. Section A shall contain very short answer type questions (One or two line answer) or objective typequestions (fill in the blank) (not multiple choice questions)
3. Section B shall contain short answer type questions with the limit of 150 words.
4. Section C shall contain long answer/ descriptive type questions. The students are required to answerprecisely and the answer should not exceed the limit of 350 words.
5. The students are required to study the content mentioned in the curriculum exhaustively.

EVALUATION PATTERN

- Theory 33/34/50/75 marks
- Practical 50 marks

Question Type	MM 33 (Marks X No.of Q.)	MM 34 (Marks X No.of Q.)	MM 50 (Marks X No.of Q.)	MM 75 (Marks X No.of Q.)
A (Very short Ans.)	8X1 = 08	1X9 = 09	1X10 = 10	01X10 = 10
B (Short Ans.)	2X5 = 10	2X5 = 10	3X5 = 15	5X5 = 25
C (Long Ans.)	3X5= 15	3X5= 15	5X5 = 25	8X5= 40

The evaluation pattern for B.Sc. III is hereby approved for the session 2023-24

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