



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 (under NEP)
PROGRAM: B.Sc. ZOOLOGY
PROGRAM CODE: RJSUZOO
Under NEP: Minor Subject Zoology

SEMESTER III
Course Code: RJMINZOO231

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

Level 5.0
(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.

Credit Structure for B Sc Semester III as per NEP 2020 Implemented
from the academic year 2024-2025
Minor Subject: Zoology

Semester III

Level 5.0 Minor Zoology

Courses	Course Titles	Course code	Credits	Total Credits
Major Theory I & II Botany/Chemistry	As offered by the Dept of Botany /Chemistry (student has made a choice while taking admission)	-----	2+2= 4	6
Practicals			2	
Minor Zoology (to be offered to students who have made a choice of Zoology as Minor subject				
Minor Zoology Theory	Enzymology & Metabolism -I	RJMINZOO231	2	3
Minor Zoology Practical	Based on Minor theory	RJMINZOOP231	1	

***As per University Grid**

DISTRIBUTION OF TOPICS AND CREDITS

S.Y.B.Sc. ZOOLOGY SEMESTER III

Course	Nomenclature	Credits	Duration
RJMINZOO231	Enzymology & Metabolism -I	02	30 hours
RJMINZOOP231	Practical I	01	30 hours

Hindi Vidya Prachar Samiti's Ramniranjan Jhunjhunwala College of Arts, Science & Commerce
(Empowered Autonomous College)
S.Y.B.Sc NEP Zoology Minor Syllabus Semester - III & IV

SEMESTER	:	III
TITLE OF THE SUBJECT/COURSE	:	ENZYMOLOGY & METABOLISM-I
COURSE CODE	:	RJMINZOO231
CREDITS	:	02
DURATION	:	30 HRS

LEARNING OBJECTIVES	
1	The learner will be introduced to the concept of enzyme and principles of enzyme kinetics.
2	To understand the enzyme inhibitions
3	To understand the concept of metabolism.

COURSE OUTCOMES	AFTER COMPLETING THE COURSE, THE LEARNER WILL BE ABLE TO:	PSO ADDRESSED	BLOOM'S TAXONOMY LEVEL
CO1	appreciate the integration of enzymes into functioning of metabolic pathways.	2	BT level 1, 2 &3 Classify, describe and apply
CO2	comprehend the basics of enzyme kinetics.	2,4	BT level 2, 3&4 Understand, apply and correlate
CO3	Understand the interconnection of the carbohydrate metabolism	2	BT level 2,3 &4 Interpret, apply & analyse
CO4	Understand the application of enzymes in physiology, health sciences and industry.	5	BT level 3&4 Application, Analysis

S.Y.B.Sc ZOOLOGY SEMESTER-III (THEORY)	HRS	Credit
PAPER I: ENZYMOLOGY & METABOLISM-I Course Code: RJMINZOO231	30	02
UNIT I		
ENZYMOLOGY	15	
1.1: Introduction and Nomenclature: Definition, Structure of enzyme, co-factors and co-enzymes, nomenclature, and classification (based on IUB - Enzyme Commission) of enzymes. 1.2: Enzyme Action and Kinetics: Mechanism of enzyme action; Factors affecting enzyme activity -pH, temperature, substrate. Derivation of Michaelis-Menten equation and Lineweaver-Burk plot; Concept and significance of Km, Vmax. 1.3: Enzyme Inhibition: Inhibitors, Types of Inhibitors (Competitive, non-competitive & uncompetitive inhibitors) and their kinetics . Case study: Biomarker enzymes in human diseases, Enzymes in textile industry		
UNIT II		
METABOLISM-I	15	
2.1 Study of Buffer, pKa, Henderson-Hasselbach equation. 2.2 Introduction to metabolism: Concept of metabolic pathways, anabolism, and catabolism. 2.3 Carbohydrate metabolism: Glycolysis, TCA cycle, ETS, Gluconeogenesis, Glycogenesis and Glycogenolysis. Case Study: Disorders based on carbohydrate metabolism.		

REFERENCES

- 1.Principles of Biochemistry, 2005, 2nd and 3rd edn. Lehninger A.L. Nelson D.L. and Cox M.M ,
2. Fundamentals of Biochemistry, Dr AC Deb, 1983, New Central Book Agency Ltd.
3. Biochemistry, L Stryer, 3rd/4th/5th ed, 1989 , Freeman and Co. NY
4. Harper's Biochemistry,1996, 26th edition, Murray R.K. Granner D.K. Mayes P.A. Rodwell V.M. Hall international USA
5. Outline of Biochemistry, 1976, E.E. Conn and P.K. Stumpf. John Wiley and Sons USA
6. Biochemistry , U Satyanarayan and Chakrapani, 2017, 5th ed. Elsevier.

Hindi Vidya Prachar Samiti's Ramniranjan Jhunjhunwala College of Arts, Science & Commerce
(Empowered Autonomous College)
S.Y.B.Sc NEP Zoology Minor Syllabus Semester - III & IV

SEMESTER	:	III PRACTICAL COMPONENT
TITLE OF THE SUBJECT/COURSE	:	ENZYMOLOGY & METABOLISM-I
COURSE CODE	:	RJMINZOO231
CREDITS	:	01
DURATION	:	30 hours

LEARNING OBJECTIVES	
1	To gain the skill for conduction enzyme assay.
2	To gain expertise in handling colorimeter
3	To gain practical skill to plan, execute, evaluate, analyse and interpret.
4	To develop skills for recording scientific experiments.

COURSE OUTCOMES	AFTER COMPLETING THE COURSE, THE LEARNER WILL BE ABLE TO;	PSO ADDRESSED	BLOOM'S TAXONOMY LEVEL
CO1	Gain practical skill to design, conduct, evaluate, analyse and interpret the experiment.	1, 4	BT Level 3,4,5
CO2	Handle instruments like colorimeter and pH meter	1, 3, 4	BT level 3,4,5

S.Y.B.Sc ZOOLOGY SEMESTER-III (PRACTICAL)
PRACTICAL: ENZYMOLOGY AND METABOLISM- I
Paper Code: RJMINZOOP231
1. Study the effect of varying pH on amylase activity. 2. Study the effect of varying temperature on amylase activity. 3. Preparation of buffers using Henderson-Hasselbalch equation. 4. To determine pKa of given weak acid. 5. Study of colorimeter and selection of ideal filter. 6. Determination of unknown concentration of solution using colorimeter.

Scheme of Examinations

1. Internal examination 20 marks by MCQ/Assignment/Project/Survey/Presentation/Seminar
2. One External (Semester End Examination) of 30 marks. Duration 1 hour.
3. One combined Practical Examination at the end of Semester consisting of 20 marks with minimum 20 marks for passing.
4. Minimum marks for passing Semester End Theory and Practical Exam are 40 %.
5. Students must appear for Internals to be eligible for the Semester End Examination.
6. Students must appear Semester End Examination to be able to complete total credits for a given Semester.
7. For any KT examinations, there shall be Examination on Demand and students must register for the same.
8. A candidate will be allowed to appear for the practical examinations if he/she submits a certified Journal of S.Y.B.Sc. Zoology or a certificate from the Head of the Department / Institute to the effect that the candidate has completed the practical course of SY.B.Sc. Zoology as per the minimum requirements.
9. In case of loss of journal, a candidate must produce a certificate from the Head of the Department /Institute that the practicals for the academic year were completed by the student. However, such a candidate will be allowed to appear for the practical examination, but the marks allotted for the journal (if any) will not be granted.
10. HOD's decision, in consultation with the Principal, shall remain final and abiding to all.

S.Y.B.Sc Zoology Semester III

THEORY EVALUATION AND ASSESSMENT

COURSE CODE: RJMINZOO231

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

Evaluation (Theory): Total marks per course – 50 Marks

- **Internals- 20 marks**
- **External- Semester End Examination – 30 marks**

- Question paper covering all units and topics.

Key to set effective Question paper

Question	KNOWLEDGE	UNDERSTANDING	APPLICATION and ANALYSIS	TOTAL MARKS- Per unit
Unit 1	05	05	05	15
Unit 2	05	05	05	15
-TOTAL- Per objective	10	10	10	30
% WEIGHTAGE	50	30	20	100%

SKELETON PAPER FOR THEORY -SEMESTER III

Total Marks 30

Q1. Attempt any 3 from 6 questions of the following (BASED ON UNIT I). 15 marks

Q2. Attempt any 3 from 6 questions the following (BASED ON UNIT II). 15 marks

(*Subject to change in pattern, marks will remain same)

S.Y.B.Sc Zoology Semester III

PRACTICAL EVALUATION PATTERN

COURSE CODE: RJMINZOOP231

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

Total marks: 25

Q.1. Major experiment: 10M

Demonstrate the effect of changing pH on amylase activity.

OR

Demonstrate the effect of changing temperature on amylase activity.

OR

Determine the unknown concentration of given solution using colorimeter.

OR

Selection of ideal filter using colorimeter.

Q.2. Minor experiment: 05M

Preparation of buffers using Henderson-Hasselbach equation

OR

Determine the pKa of given weak acid

Q3. Viva 05M

Q4. Journal and Attendance 05M

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 Zoology Minor	Enzymology & Metabolism -I	RJMINZOO231	Domain knowledge . To understand the energy metabolism in the body.	Domain knowledge. To understand the interconnection between the regional diversity and genetic differences in population wrt to metabolism.	Domain knowledge in enzymology and metabolism.	To master the concept of enzyme kinetics
S Y B Sc Zoology Minor	Practical	RJMINZOOP231	To study the physiological adaptations of the animals found locally.	To study the physiological adaptations of the animals found regionally	Training in the SOP of instruments.	Training in the SOP of instruments.

Hindi Vidya Prachar Samiti's Ramniranjan Jhunjhunwala College of Arts, Science & Commerce
(Empowered Autonomous College)
S.Y.B.Sc NEP Zoology Minor Syllabus Semester - III & IV

Mapping of the course to Employability/ Entrepreneurship/Skill development

Class	Course Name	Course Code	Topic focussing on Employability/ Entrepreneurship/ skill development	Employability/Entrepreneurship/Skill development	Specific activity
SYBSc Zoology	Enzymology and Metabolism -I	RJMINZOO231	Enzymology focuses on study and application of enzymes in industry, health care and research. Metabolism	The understanding of enzyme kinetics will help in career as researcher, lab technician, industry in quality control Knowledge of metabolism enhances the ability to interrelate and interpret leading to development of analytical skills which will aid in careers related to research, pathology laboratory and health care	Enzyme kinetics Enzyme inhibitors Application of enzymes as biomarkers in diagnostics, health care and industry. Relationship of metabolism and their relation to human health.
SYBSc Zoology	Practical I	RJMINZOOP231	Enzymology and Metabolism I	The practical will develop the skill of precision, analytical ability and critical thinking. Handling of instruments according to SOP. Writing of the experiment scientifically. These skills will be useful in building career as researcher, laboratory technician, healthcare industry	Enzyme assay Use of colorimeter, pH meter, Titration. Drawing graphs

Integration of Cross cutting Issues

Class	Course Code	Cross Cutting Issues
S Y B Sc Zoology Minor	RJMINZOO231 RJMINZOOP231	Ethics, Environment and Sustainability UNSDG 2,4 NEP2020 Interdisciplinary

SEMESTER IV



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 (under NEP)

PROGRAM: B.Sc. ZOOLOGY

PROGRAM CODE: RJSUZOO

Under NEP: Minor Subject Zoology

SEMESTER IV

Course Code: RJMINZOO241

(REVISED in 2024-2025 in alignment with the NEP2020 facilitating the inter-and multidisciplinary learning and multiple entry and exit of the students)

Level 5.0

(CBCS 2024-2025)

Credit Structure for B Sc Semester IV as per NEP 2020 Implemented

from the academic year 2024-2025

Minor Subject: Zoology

Semester IV

Level 5.0 Minor Zoology

Courses	Course Titles	Course code	Credits	Total Credits
Major Theory I & II Botany/Chemistry	As offered by the Dept of Botany /Chemistry (student has made a choice while taking admission)	-----	2+2= 4	6
Practicals			2	
Minor Zoology (to be offered to students who have made a choice of Zoology as Minor subject)				
Minor Zoology Theory	Molecular Biology & Metabolism -II	RJMINZOO241	2	3
Minor Zoology Practical		RJMINZOOP241	1	

***As per University Grid**

DISTRIBUTION OF TOPICS AND CREDITS

S.Y.B.Sc. ZOOLOGY SEMESTER IV

Course	Nomenclature	Credits	Duration
RJMINZOO241	Molecular Biology & Metabolism -II	02	30 hours
RJMINZOOP241	Practical I	01	30 hours

Hindi Vidya Prachar Samiti's Ramniranjan Jhunjhunwala College of Arts, Science & Commerce
(Empowered Autonomous College)
S.Y.B.Sc NEP Zoology Minor Syllabus Semester - III & IV

SEMESTER	:	IV
TITLE OF THE SUBJECT/COURSE	:	MOLECULAR BIOLOGY & METABOLISM-II
COURSE CODE	:	RJMINZOO241
CREDITS	:	02
DURATION	:	30 hours

LEARNING OBJECTIVES	
1	The learner will be introduced to the concepts of molecular biology.
2	To understand the flow of genetic information.
3	To understand the concept of lipid and protein metabolism.

COURSE OUTCOMES	AFTER COMPLETING THE COURSE, THE LEARNER WILL BE ABLE TO:	PSO ADDRESS ED	BLOOM'S TAXONOMY LEVEL
CO1	appreciate the relationship between DNA and RNA	2	BT level 1, 2 &3 Classify, describe and apply
CO2	comprehend the flow of genetic information at molecular level	3,4	BT level 2, 3 & 4 Understand, apply and correlate
CO3	Understand the mechanisms of the protein and lipid metabolism	2	BT level 2,3 & 4 Interpret, apply & analyse
CO4	Understand the inter-relationships of metabolic processes.	5	BT level 3&4 Application, Analysis

S.Y.B.Sc ZOOLOGY SEMESTER-IV (THEORY)	HRS	Credit
PAPER I: MOLECULAR BIOLOGY & METABOLISM-II Course Code: RJMINZOO241	30	02
UNIT I		
MOLECULAR BIOLOGY	15	
1.1 DNA and RNA as genetic material: Griffith's transformation experiment, Avery-Macleod and McCarty experiment, Hershey-Chase experiment. Singer & Conrat experiment. 1.2 Genetic code: History, concept & properties. 1.3 Flow of genetic information in prokaryotes: Chromosomal DNA (nucleoid) structure, DNA replication, Transcription, Translation. 1.4 Operon: Concept of Operon, Structure & regulation of lac operon Case studies: Mitochondrial DNA and forensics		
UNIT II		
METABOLISM-II	15	
2.1 Lipid Metabolism: Catabolism and Anabolism (β - Oxidation), Ketogenesis 2.2 Protein Metabolism: Catabolism and Anabolism 2.3 Amino acid Metabolism: transamination, deamination (oxidative and non-oxidative), Urea cycle. 2.4 Intermediary metabolism: Acetyl – CoA as a common product in metabolism of carbohydrates, proteins and lipids. Case Study: Obesity, Diabetic ketoacidosis, Respiratory distress syndrome		

REFERENCES

- 1.Principles of Biochemistry, 2005, 2nd and 3rd edn. Lehninger A.L. Nelson D.L. and Cox M.M,
2. Biochemistry, L Stryer, 3rd/4th/5th ed, 1989, Freeman and Co. NY
3. Harper's Biochemistry,1996, 26th edition, Murray R.K. Granner D.K. Mayes P.A. Rodwell V.M. Hall international USA
4. Biochemistry, U. Satyanarayan and Chakrapani, 2017, 5th ed. Elsevier.
5. Introduction to Molecular Biology; Peter Paoletta; Tata McGraw Hill; 2010.
6. Molecular Biology; David Freifelder; Narosa Publishing House; 2008.

Hindi Vidya Prachar Samiti's Ramniranjan Jhunjhunwala College of Arts, Science & Commerce
(Empowered Autonomous College)
S.Y.B.Sc NEP Zoology Minor Syllabus Semester - III & IV

SEMESTER	:	IV PRACTICAL COMPONENT
TITLE OF THE SUBJECT/COURSE	:	MOLECULAR BIOLOGY & METABOLISM-II
COURSE CODE	:	RJMINZOO241
CREDITS	:	01
DURATION	:	30 HOURS

LEARNING OBJECTIVES	
1	To gain the skill for quantitative assays.
2	To gain expertise in handling colorimeter.
3	To gain practical skill to plan, execute, evaluate, analyse and interpret.
4	To develop skills for solving problems related to transcription and translation.

COURSE OUTCOMES	AFTER COMPLETING THE COURSE, THE LEARNER WILL BE ABLE TO;	PSO ADDRESSED	BLOOM'S TAXONOMY LEVEL	SDG
CO1	Gain practical skill to design, conduct, evaluate, analyse and interpret the experiment.	1, 4	BT Level 3,4,5	2
CO2	Understand and analyse molecular data,	2, 3, 4	BT level 3,4,5	2

S.Y.B.Sc ZOOLOGY SEMESTER-IV(PRACTICAL)
Practical: Molecular Biology and Metabolism- I
Paper Code: RJMINZOOP241
1. Quantitative estimation of DNA by Diphenylamine method. 2. Quantitative estimation of RNA by Orcinol method. 3. Problems based of Transcription, translation and genetic code. 4. Estimation of creatinine from serum/urine sample. 5. Estimation of total cholesterol from plasma sample.

Scheme of Examinations

1. Internal examination 20 marks by MCQ/Assignment/Project/Survey/Presentation/Seminar
2. One External (Semester End Examination) of 30 marks. Duration 1 hour.
3. One combined Practical Examination at the end of Semester consisting of 25 marks with minimum 20 marks for passing.
4. Minimum marks for passing Semester End Theory and Practical Exam are 40 %.
5. Students must appear for Internals to be eligible for the Semester End Examination.
6. Students must appear Semester End Examination to be able to complete total credits for a given Semester.
7. For any KT examinations, there shall be Examination on Demand and students must register for the same.
8. A candidate will be allowed to appear for the practical examinations if he/she submits a certified Journal of S.Y.B.Sc. Zoology or a certificate from the Head of the Department / Institute to the effect that the candidate has completed the practical course of SY.B.Sc. Zoology as per the minimum requirements.
9. In case of loss of journal, a candidate must produce a certificate from the Head of the Department /Institute that the practicals for the academic year were completed by the student. However, such a candidate will be allowed to appear for the practical examination, but the marks allotted for the journal (if any) will not be granted.
10. HOD's decision, in consultation with the Principal, shall remain final and abiding to all.

S.Y.B.Sc Zoology Semester IV

THEORY EVALUATION AND ASSESSMENT

COURSE CODE: RJMINZOO241

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

Evaluation (Theory): Total marks per course – 50 Marks

- **Internals- 20 marks**
- **External- Semester End Examination – 30 marks**
- Question paper covering all units and topics.

Evaluation of Practical per Semester - 50 marks

Key to set effective Question paper

Question	KNOWLEDGE	UNDERSTANDING	APPLICATION and ANALYSIS	TOTAL MARKS- Per unit
Unit 1	05	05	05	15
Unit 2	05	05	05	15
-TOTAL- Per objective	10	10	10	30
% WEIGHTAGE	50	30	20	100%

SKELETON PAPER FOR THEORY -SEMESTER IV

Total Marks 30

Q1. Attempt any 3 from 6 questions of the following (BASED ON UNIT I). 15 marks

Q2. Attempt any 3 from 6 questions the following (BASED ON UNIT II). 15 marks

(*Subject to change in pattern, marks will remain same)

S.Y.B.Sc Zoology Semester IV

PRACTICAL EVALUATION PATTERN

COURSE CODE: RJMINZOOP241

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

Total marks: 25

Q.1 Major experiment: 06M

Estimate the amount of DNA in the given tissue sample by Diphenylamine method.

OR

Estimate the amount of RNA in the given tissue sample by Orcinol method.

Q.2.Minor experiment: 04M

Estimation of cholesterol from the given plasma/serum sample.

OR

Estimation of creatinine from the given plasma/serum sample.

Q.3. Problems based of Transcription, translation and genetic code. 05M

Q4. Field report 05M

Q.5. Journal and attendance. 05M

Note for Examiner: Modify difficulty level of Major /Minor expt. in comparison to MAJOR BATCH

Hindi Vidya Prachar Samiti's Ramniranjan Jhunjhunwala College of Arts, Science & Commerce
(Empowered Autonomous College)
S.Y.B.Sc NEP Zoology Minor Syllabus Semester - III & IV

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 Zoology Major	Molecular Biology & Metabolis m II	RJMINZOO24 1	Domain knowledge. To understand the energy metabolism in the body.	Domain knowledge. To understand the interconnectio n between the geographical population and changes in metabolism.	Domain knowledge in molecular biology and metabolism.	To master the concept of transcription and translation
S Y B Sc Zoology Major	Practical	RJMINZOO2 41	To understand the process for estimation of biochemical parameters of local population.	To study the physiological adaptations of the animals found regionally	Training in the SOP of instruments. Problem solving ability.	Training in the field of molecular biology

Hindi Vidya Prachar Samiti's Ramniranjan Jhunjhunwala College of Arts, Science & Commerce
(Empowered Autonomous College)
S.Y.B.Sc NEP Zoology Minor Syllabus Semester - III & IV

Mapping of the course to Employability/ Entrepreneurship/Skill development

Class	Course Name	Course Code	Topic focussing on Employability/ Entrepreneurship /skill development	Employability/Entrepreneurship/Skill development	Specific activity
SYBSc Zoology	Molecular Biology & Metabolism II	RJMINZOO241	Molecular biology focuses on study of flow of genetic information useful in health care and research. Metabolism	Understanding of molecular biology will help the learner to work in research institutes for health care, cancer research etc. Knowledge of metabolism enhances the ability to interrelate and interpret leading to development of analytical skills which will aid in careers related to research, pathology laboratory and health care	Application of basic knowledge in developing protein sequences. Relationship of metabolism and their relation to human health.
SYBSc Zoology	Practical I	RJMINZOOP241	Molecular biology and Metabolism II	The practical will develop the skill of precision, analytical ability and critical thinking. Handling of instruments according to SOP. Writing of the experiment scientifically. These skills will be useful in building career as researcher, laboratory technician, healthcare industry	Use of colorimeter, Estimation of biochemical parameters, Solving problems related to transcription and translation.

Integration of Cross cutting Issues

Class	Course Code	Cross Cutting Issues
S Y B Sc Zoology Minor	RJMINZOO241 RJMINZOOP241	Ethics, Environment and Sustainability, Good health and well being UNSDG 2,4,3 NEP2020 Interdisciplinary