



# UNIVERSITY OF JAMMU

(NAAC ACCREDITED 'A' GRADE' UNIVERSITY)  
Baba Sahib Ambedkar Road, Jammu-180006 (J&K)

Academic Section

Email: [academicsectionju14@gmail.com](mailto:academicsectionju14@gmail.com)

## NOTIFICATION

(23/April/Adp./11 )

It is hereby notified for the information of all concerned that the Vice-Chancellor, in anticipation of the approval of the Academic Council, is pleased to authorize the adoption of the Syllabi and Courses of Studies in the subject of **Zoology of Semester IIIrd and IVth for Four Year Under Graduate Programme (FYUGP) under the Choice Based Credit System as per NEP-2020 (as given in the annexure) for the examinations to be held in the years as per the details given below:**

Subject	Semester	For the examinations to be held in the year
Zoology	Semester-III Semester-IV	December 2023, 2024 and 2025 May 2024, 2025 and 2026

The Syllabi of the courses is also available on the University website: [www.jammuuniversity.ac.in](http://www.jammuuniversity.ac.in).

Sd/-

DEAN ACADEMIC AFFAIRS

No. F. Acd/II/23/1537-1567

Dated: 03/5/23

Copy for information and necessary action to:

1. Dean Faculty of Life-Science
2. HOD/Convener, Board of Studies Zoology/Sy. P.A to C.O.E.
3. All members of the Board of Studies
4. C.A. to the Controller of Examinations
5. Director, Computer Centre, University of Jammu
6. Deputy Registrar/Asst. Registrar (Conf. /Exams. UG )
7. Incharge University Website for necessary action please

*Sumitashamo*  
Deputy Registrar (Academic) 21/5/23

*TS*  
11/5/23

*AC*  
11/5

*M*  
20/4/23

# University of Jammu

Syllabi of Zoology for FYUP under CBCS as per NEP-2020

## SEMESTER-III

(Examination to be held in 2023, 2024, 2025)

### Major Course

Course Code: UMJZOT301

Course Title: Evolutionary Biology

Credits: 04 {03(Theory) + 01(Practical)}

Total no. of lectures: Theory: 45 hours

Practical: 30 hours

Maximum Marks: 100

Theory: 75

Practical/Tutorial: 25

### Major Course

Course Code: UMJZOT302

Course Title: Environmental Biology

Credits: 04 {03(Theory) + 01(Practical)}

Total no. of lectures: Theory: 45 hours

Practical: 30 hours

Maximum Marks: 100

Theory: 75

Practical/Tutorial: 25

### Minor Course

Course Code: UMIZOT303

Course Title: Ecology and Environment

Credits: 04 {03(Theory) + 01(Practical)}

Total no. of lectures: Theory: 45 hours

Practical: 30 hours

Maximum Marks: 100

Theory: 75

Practical/Tutorial: 25

### Multidisciplinary Course

Course Code: UMDZOT304

Course Title: Economic Zoology

Credits: 03

Total no. of lectures: Theory: 45 hours

Maximum Marks: 75

Theory: 75

### Skill Enhancement Course

Course Code: USEZOT305

Course Title: Medical Genetics

Credits: 02

Total no. of lectures: Theory/Practical: 45 hours

(15 hours)/(30 hours)

Maximum Marks: 50

Theory/Practical: 50

**UNIVERSITY OF JAMMU**  
**SYLLABI AND COURSE OF STUDY IN ZOOLOGY UNDER CBCS AS**  
**PER NEP - 2020**  
**(For the Examination to be held in Year 2023, 2024 & 2025)**  
**(MAJOR COURSE)**  
**UGSEMESTER-III**

MAJOR CORE COURSE NO.	:	UMJZOT301
MAJOR CORE COURSE TITLE	:	EVOLUTIONARY BIOLOGY
CREDITS	:	04{03 (Theory) + 01 (Practical)}
MAXIMUM MARKS	:	75
I) External (University Exam)	:	60
II) Internal Assessment	:	15
DURATION OF UNIVERSITY EXAM	:	03 Hours
MAXIMUM MARKS PRACTICALS	:	25
I) Continuous assessment	:	10
II) Final examination	:	15

**Objectives and Expected Learning Outcomes**

The course provides an introduction to the evolution and covers the basic aspects of evolutionary biology. After successfully completing this course, the students will be able to understand how the life originated on the Earth and will come to know about the various evidences related to the evolution.

**UNIT I: Introduction to Evolution**

**(13 Hrs.)**

- 1.1 Origin of life
  - 1.1.1 Biogenesis
  - 1.1.2 Abiogenesis
  - 1.1.3 Theory of Special Creation
  - 1.1.4 Biochemical Origin of Life
- 1.2 Evidences of Evolution
  - 1.2.1 Morphological Evidences
  - 1.2.2 Anatomical Evidences
  - 1.2.3 Embryological Evidences
  - 1.2.4 Paleontological Evidences

**UNIT 2: Theories of Evolution**

**(13 Hrs.)**

- 2.1 Lamarckism
- 2.2 Neo-Lamarckism
- 2.3 Darwinism



- 2.4 Neo-Darwinism
- 2.5 Mutation Theory

**UNIT 3: Natural Selection (10 Hrs.)**

- 3.1 Natural Selection-Definition and Types
- 3.2 Variation
- 3.3 Elemental Forces of Evolution
  - 3.3.1 Mutation
  - 3.3.2 Recombination
  - 3.3.3 Hybridisation
  - 3.3.4 Isolation
  - 3.3.5 Founder's Principle
  - 3.3.6 Genetic Drift
- 3.4 Hardy-Weinberg Law

**UNIT 4: Patterns of Evolution (10 Hrs.)**

- 4.1 Sequential and Divergent Evolution
- 4.2 Evolution of Horse
- 4.3 Evolution of Man
- 4.4 Animal Distribution- Classification and Pattern
- 4.5 Zoogeography

**Practicum (30 Hrs.)**

1. Study of Lamarckism from chart
2. Study of Darwin's finches from chart/model
3. Study of Human Evolution from chart
4. Study of Horse Evolution from chart
5. Study of *Archaeopteryx* from model
6. Study of different types of dinosaurs from models
7. Study of *Latimeri/Sphenodon*/any other fossil
8. Zoogeographic study through maps

**NOTE FOR PAPER SETTING**

Examination Theory/Practical	Syllabus to be covered in Examination	Time allotted for Exam	Marks
Internal Theory Assessment	50%	1 Hr and 30 Min	15
External Theory End Semester	100%	3 Hrs	60
Continuous assessment	-	-	10 (Based on Daily Performance only)
Final examination	-	-	15



**External End Semester Theory Examination will have two sections (A & B) {Total marks 60}**

Section A : Four short answer questions representing all units/syllabi i.e., one question from each unit. Each question shall be of 3 marks.

Section B: Eight long answer questions (Four to be attempted) representing whole of the syllabi i.e., two questions from each unit. Each question shall be of 12 marks. Candidates are required to attempt four questions in all, selecting one from each unit.

**Internal Assessment {Total marks 15}**

Fifteen (15) marks for theory paper in a subject reserved for internal assessment shall have one long answer type question of 7 marks and four short answer type questions of 2 marks each.

**Recommended Readings**

1. VB Rastogi. Organic Evolution (Evolutionary Biology).
2. Stephen C Stearns and Rolf F Hoekstra. Evolution-An Introduction.
3. John Gribbin and Mary Gribbin. On the Origin of Evolution.
4. Bernard Wood. Human Evolution-A Very Short Introduction.
5. Balwan WK and Saba N. Genetics and Evolution.
6. Singh and Tomar. Evolutionary Biology.
7. Mandal F B. Introduction to Evolutionary Biology



**UNIVERSITY OF JAMMU**  
**SYLLABI AND COURSE OF STUDY IN ZOOLOGY**  
**For the Examination to be held in 2023, 2024 & 2025**  
**(MAJOR COURSE)**  
**UG SEMESTER-III**  
**UNDER NEP-2020**

MAJOR CORE COURSE NO.	:	UMJZOT302
MAJOR CORE COURSE TITLE	:	ENVIRONMENTAL BIOLOGY
CREDITS	:	04 {03 (THEORY) + 01 (Practical)}
MAXIMUM MARKS	:	75
I) External (University Exam)	:	60
II) Internal Assessment	:	15
DURATION OF UNIVERSITY EXAM	:	03 Hours
MAXIMUM MARKS PRACTICALS	:	25
I) Continuous Assessment	:	10
II) Final Examination	:	15

**Objectives and Expected Learning Outcomes**

The course provides an introduction to the environmental biology and covers basic aspects of ecology. After successfully completing this course, the students will be able to understand about the importance and scope of ecology.

**UNIT I: Introduction to Ecology**

(10 Hrs.)

- 1.1 Ecology
  - 1.1.1 Definition and Types
  - 1.1.2 Branches and Scope
- 1.2 Environmental Studies: Definition, Aim and Need
- 1.3 Environment: Definition, Parts and Uses
- 1.4 Medium
  - 1.4.1 Water: Forms, Types and Hydrological Cycle
  - 1.4.2 Soil and its types

**UNIT 2: Population Ecology**

(10 Hrs.)

- 2.1 Population Interaction
  - 2.1.1 Mutualism
  - 2.1.2 Commensalism
  - 2.1.3 Parasitism
- 2.2 Population Characteristics
  - 2.2.1 Density
  - 2.2.2 Natality
  - 2.2.3 Mortality
  - 2.2.4 Age distribution



- 2.2.5 Population Growth
- 2.2.6 Population Fluctuation & Equilibrium
- 2.2.7 Biotic Potential & Dispersal

**UNIT 3: Community Ecology**

**(12 Hrs.)**

- 3.1 Characteristics of Community
- 3.2 Ecological succession
- 3.3 Dynamics of Ecosystem
  - 3.3.1 Energy Flow
  - 3.3.2 Primary & Secondary Production
  - 3.3.3 Food Chain
  - 3.3.4 Food Web
  - 3.3.5 Ecological Pyramids
- 3.4 Role of Producers in the Ecosystem

**UNIT 4: Environmental Pollution**

**(13 Hrs.)**

- 4.1 Air Pollution
- 4.2 Water Pollution
- 4.3 Soil Pollution
- 4.4 Noise Pollution
- 4.5 Thermal Pollution
- 4.6 Plastic Pollution

**PRACTICUM**

**(30 Hrs.)**

1. To measure the pH of a given sample of water.
2. To determine the amount of dissolved oxygen in a sample of water.
3. To determine amount of free Carbon dioxide in a sample of water.
4. To determine total alkalinity of a sample of water.
5. To measure the total hardness of a given sample of water.
6. To study interaction between hermit crab and sea anemone.
7. To study depth and turbidity of local water body using Sacchi disc.
8. To study noise pollution levels in different localities in your surroundings.
9. To study mutualism between *Trichonympha* and termite.



**NOTE FOR PAPER SETTING**

Examination Theory/Practical	Syllabus to be covered in Examination	Time allotted for Exam	Marks
Internal Theory Assessment	50%	1 Hr and 30 Min	15
External Theory End Semester	100%	3 Hrs	60
Continuous assessment	-	-	10 (Based on daily Performance only)
Final Examination	-	-	15

**External End Semester Theory Examination will have two sections (A & B) (Total Marks 60)**

**Section A:** Four short answer questions representing all units/syllabi i.e., one question from each unit. Each question shall be of 3 marks.

**Section B:** Eight long answer questions (Four to be attempted) representing whole of the syllabi i.e., two questions from each unit. Each question shall be of 12 marks. Candidates are required to attempt four questions in all, selecting one from each unit.

**Internal Assessment (Total Marks 15)**

Fifteen (15) marks for theory paper in a subject reserved for internal assessment shall have one long answer type question of 7 marks and four short answer type questions of 2 marks each.

**Recommended Readings**

1. Eugene P Odum and Gary W Baret . Fundamentals of Ecology.
2. Jaboury Gazole. Ecology : A very short Introduction
3. Balwan WK and Saba N. Animal Science & Environmental Issues, Random Publication, Delhi.
4. Michael Bigon, Robert Howarth, Colin Townsend. Essentials of Ecology.
5. Arvind Kumar & L K Singh. Advanced Ecology
6. Shivesh P Singh and Balwan WK. Fish Genetic & Aquatic Environment. Amiga Press Inc.
7. Rasool N and Balwan WK. Environmental studies.
8. Bhatia AL. Text book of Environmental Biology.
9. Neeraj N. Environment and Ecology: A dynamic approach.
10. Dash and Dash. Fundamentals of Ecology
11. Singh, J.S., S.P & Gupta, S.R. 2006. Ecology, Environment and Resource conservation. Anamaya Publ., New Delhi, 688 pp.





**UNIVERSITY OF JAMMU**  
**SYLLABI AND COURSE OF STUDY IN ZOOLOGY**  
**For the Examination to be held in Year 2023, 2024 & 2025**  
**(MINOR COURSE)**  
**UG SEMESTER-III**  
**UNDER NEP-2020**

MINOR CORE COURSE NO.	:	UMIZOT303
MINOR CORE COURSE TITLE	:	ECOLOGY AND ENVIRONMENT
CREDITS	:	04 {03 (THEORY) + 01 (Practical)}
MAXIMUM MARKS	:	75
I) External (University Exam)	:	60
II) Internal Assessment	:	15
DURATION OF UNIVERSITY EXAM	:	03 Hours
MAXIMUM MARKS PRACTICALS	:	25
I) Continuous Assessment	:	10
II) Final Examination	:	15

**Objectives and Expected Learning Outcomes**

The course provides an introduction to the environmental biology and covers basic aspects of ecology. After successfully completing this course, the students will be able to understand about the importance and scope of ecology.

**UNIT I: Introduction to Ecology**

(10 Hrs.)

- 1.1 Ecology
  - 1.1.1 Definition and Types
  - 1.1.2 Branches and Scope
- 1.2 Environmental Studies: Definition, Aim and Need
- 1.3 Environment: Definition, Parts and Uses
- 1.4 Medium
  - 1.4.1 Water: Forms, Types and Hydrological Cycle
  - 1.4.2 Soil and its types

**UNIT 2: Population Ecology**

(10 Hrs.)

- 2.1 Population Interaction
  - 2.1.1 Mutualism
  - 2.1.2 Commensalism
  - 2.1.3 Parasitism
- 2.2 Population Characteristics
  - 2.2.1 Density
  - 2.2.2 Natality
  - 2.2.3 Mortality
  - 2.2.4 Age distribution
  - 2.2.5 Population Growth



- 2.2.6 Population Fluctuation & Equilibrium
- 2.2.7 Biotic Potential & Dispersal

**UNIT 3: Community Ecology**

**(12 Hrs.)**

- 3.1 Characteristics of Community
- 3.2 Ecological succession
- 3.3 Dynamics of Ecosystem
  - 3.3.1 Energy Flow
  - 3.3.2 Primary & Secondary Production
  - 3.3.3 Food Chain
  - 3.3.4 Food Web
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- 3.4 Role of Producers in the Ecosystem

**UNIT 4: Environmental Pollution**

**(13 Hrs.)**

- 4.1 Air Pollution
- 4.2 Water Pollution
- 4.3 Soil Pollution
- 4.4 Noise Pollution
- 4.5 Thermal Pollution
- 4.6 Plastic Pollution

**PRACTICUM**

**(30 Hrs.)**

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4. To determine total alkalinity of a sample of water.
5. To measure the total hardness of a given sample of water.
6. To study interaction between hermit crab and sea anemone.
7. To study interaction between hermit crab and sea anemone.
8. To study depth and turbidity of local water body using Sacchi disc.
9. To study noise pollution levels in different localities in your surroundings.
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**Internal Assessment (Total Marks 15)**

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3. Balwan WK and Saba N. Animal Science & Environmental Issues, Random Publication, Delhi.
4. Michael Bigon, Robert Howarth, Colin Townsend. Essentials of Ecology.
5. Arvind Kumar & L K Singh. Advanced Ecology
6. Shivesh P Singh and Balwan WK. Fish Genetic & Aquatic Environment. Amiga Press Inc.
7. Rasool N and Balwan WK. Environmental studies.
8. Bhatia AL. Text book of Environmental Biology.
9. Neeraj N. Environment and Ecology: A dynamic approach.
10. Dash and Dash. Fundamentals of Ecology
11. Singh, J.S., S.P & Gupta, S.R. 2006. Ecology, Environment and Resource conservation. Anamaya Publ., New Delhi, 688 pp.

**UNIVERSITY OF JAMMU**  
**SYLLABI AND COURSE OF STUDY IN ZOOLOGY UNDER CBCS AS**  
**PER NEP - 2020**

**(For the Examination to be held in Year 2023, 2024 & 2025)**

**(MULTIDISCIPLINARY COURSE)**

**UG SEMESTER-III**

MULTIDISCIPLINARY COURSE NO.	:	UMDZOT304
MULTIDISCIPLINARY COURSE TITLE	:	ECONOMIC ZOOLOGY
CREDIT	:	03
MAXIMUM MARKS	:	75
I) External (University Exam)	:	60
II) Internal Assessment	:	15
DURATION OF UNIVERSITY EXAM	:	03 Hours

**Objectives and Expected Learning Outcomes**

The course will acquaint the students with basic understanding of the epidemiology, economic zoology and parasitology. Upon successful completion of this course, the student should be able to have some knowledge of epidemiology of common infectious diseases, management of poultry & Cattle breeds and about the immunity.

**Unit 1: Epidemiology**

**(12 Hrs.)**

- 1.1 Epidemiology: Definition, Scope and Applications.
- 1.2 Communicable Diseases: Cause, Mode of transmission, Symptoms, Prevention and Treatment of:
  - 1.2.1 Tuberculosis
  - 1.2.2 AIDS
  - 1.2.3 Covid-19
- 1.3 Non-communicable Diseases: Cause, Mode of transmission, Symptoms, Prevention and Treatment of
  - 1.3.1 Hypertension
  - 1.3.2 Cancer
  - 1.3.3 Diabetes

**Unit 2: Economic Zoology**

**(13 Hrs. )**

- 2.1 Apiculture
  - 2.1.1 Apiculture: Definition, Status and Scope
  - 2.1.2 Products of Apiculture and their uses
  - 2.1.3 Life Cycle of Honey bee
- 2.2 Sericulture
  - 2.2.1 Sericulture; Definition, Status and Scope
  - 2.2.2 Life cycle of Silkworm
  - 2.2.3 Silk: Types & Uses

**Unit 3: Dairy and Poultry Farming**

**(10 Hrs. )**



- 3.1 Introduction to Dairy
- 3.2 Cattle Breeds: Characters of Red Sindhi, Sahiwal & Jersey
- 3.3 Introduction to Poultry farming
- 3.4 Poultry Breeds: Characters of Rhode Island Red, White Leghorn & Black Minorca

**Unit 4: Parasitology**

**(10 Hrs.)**

- 4.1 Immunity: Definition & its types.
- 4.2 Concept and Types of Symbiotic Relationships
- 4.3 Parasite, Vectors and Hosts
  - 4.3.1 Parasites: Definition and Types
  - 4.3.2 Vectors: Definition and Types
  - 4.3.3 Vector borne Diseases: Dengue and Malaria
  - 4.3.4 Host: Definition and Types

**NOTE FOR PAPER SETTING**

Examination Theory/Practical	Syllabus to be covered in Examination	Time allotted for Exam	Marks
Internal Theory Assessment	50%	1 Hr and 30 Min	15
External Theory End Semester	100%	3 Hrs	60

**External End Semester Theory Examination will have two sections (A & B) {Total marks 60}**

Section A : Four short answer questions representing all units/syllabi i.e., one question from each unit. Each question shall be of 3 marks.

Section B: Eight long answer questions (Four to be attempted) representing whole of the syllabi i.e., two questions from each unit. Each question shall be of 12 marks. Candidates are required to attempt four questions in all, selecting one from each unit.

**Internal Assessment {Total marks 15}**

Fifteen (15) marks for theory paper in a subject reserved for internal assessment shall have one long answer type question of 7 marks and four short answer type questions of 2 marks each.

**Books Recommended:**

1. Food ,Nutrition and Health By Shashi Goyal and Pooja
2. Food,Nutrition and Health Ist Edition By Linda Tapsell,Oxford
3. Principles of Therapeutics Nutrition and Diabetics By A Vantina Sharma,CBS Publishers and Distributors Pvt.Ltd.
4. Elia Metal ( eds): Clinical Nutrition ,Wiley Blackwell,A John Wiley and Sons Ltd.
5. Introduction to human nutrition By Wiley- Blackwell and A John Wiley and Sons.



**UNIVERSITY OF JAMMU**  
**SYLLABI AND COURSE OF STUDY IN ZOOLOGY UNDER CBCS AS**  
**PER NEP - 2020**

**(For the Examination to be held in Year 2023, 2024 & 2025)**

**(SKILL ENHANCEMENT COURSE)**

**UG SEMESTER-III**

<b>SKILL ENHANCEMENT COURSE NO.</b>	<b>:</b>	<b>USEZOT305</b>
<b>SKILL ENHANCEMENT COURSE TITLE</b>	<b>:</b>	<b>MEDICAL GENETICS</b>
<b>CREDIT</b>	<b>:</b>	<b>02</b>
<b>MAXIMUM MARKS</b>	<b>:</b>	<b>50</b>
<b>I) External (University Exam)</b>	<b>:</b>	<b>40</b>
<b>II) Internal Assessment</b>	<b>:</b>	<b>10</b>
<b>DURATION OF UNIVERSITY EXAM</b>	<b>:</b>	<b>02 Hours and 30 Minutes</b>

**Objectives and Expected Learning Outcomes**

The course will acquaint the students with basic understanding of the clinical genetics. The course also gives an account of the genetic disorders, diagnosis of chromosomal disorders and genetic counseling. After completing this course the learners will be able to increase their skill, attitudes and knowledge towards causes of genetic diseases and understand about the importance of karyotype and scope of human clinical genetics.

**UNIT-1: Introduction to Medical Genetics**

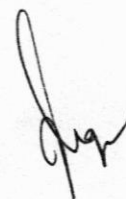
**(7 Hrs.)**

- 1.1 Medical Genetics: Introduction and its importance in Healthcare
- 1.2 Chromosomal Disorders
  - 1.2.1 Down's syndrome
  - 1.2.2 Klinefelter's syndrome
  - 1.2.3 Turner's syndrome
- 1.3 Genetic Counselling
- 1.4 Gene Therapy

**Unit-2: Developmental & Biochemical Genetics**

**(8 Hrs.)**

- 2.1 Genetic Basis of Sex
  - 2.1.1 Mechanism of Sex Determination
  - 2.1.2 Dosage Compensation
  - 2.1.3 Sex Limited and influenced genes
- 2.2 Introduction to Prenatal Diagnosis
- 2.3 Basic concept of Human fertility and Infertility
- 2.4 Sex linked inheritance
  - 2.4.1 Haemophilia
  - 2.4.2 Color Blindness



**Unit-3: Practical Genetics**

**(30 Hrs.)**

- 3.1 Sex Chromatin (Barr body)
- 3.2 Human Karyotype
  - 3.2.1 Normal Human Male
  - 3.2.2 Normal Human Female
- 3.3 Introduction to chromosome preparation from peripheral blood
- 3.4 Drawing and Interpreting a Pedigree
- 3.5 Study of clinical features of common human genetic disorders (through photographs)

**NOTE FOR PAPER SETTERS:**

Total Marks of the USEZOT-305 is 50 of which 20% marks shall be reserved for internal assessment (10 marks). Remaining 80% of the marks (40 marks) shall be reserved for external examination to be conducted by the University/Colleges.

***Internal Assessment Test (10 Marks)***

Internal Assessment Paper of 10 Marks shall consist of Theory Question/s of 5 Marks from Unit I/II and 5 Marks of Practical Exercise from Unit III.

***External End Semester University / College Examination***

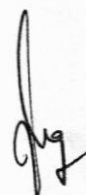
External Theory Exam shall be of 40 Marks and consist of 2 sections:

**Section A:** Four (4) short answer questions representing all Units/Syllabi i.e., atleast one question from each Unit. Each question shall be of 2.5 marks (All Compulsory)

**Section B:** Six (6) long answer questions (Three to be attempted) representing whole of the syllabi i.e., two questions from each unit. Each question shall be of 10 marks.

**RECOMMENDED READINGS**

1. Jorde, Carey, Bamshad and White. Medical Genetics.
2. Gangane SD. Human Genetics, Elsevier Publications.
3. Alice Marcus. Human Genetics: An overview. Narosa Publications.
4. Saba N and Balwan WK. Cytogenetics, Random Publications, New Delhi.
5. Kapur and Suri. Basic Human Genetics. Jaypee Brothers medical publishers, Delhi.
6. Balwan WK. Genetics. Virgo Publishers, New Delhi
7. Lewis. Human Genetics.



**University of Jammu**  
Syllabi of Zoology for FYUP under CBCS as per NEP-2020

**SEMESTER-IV**  
(Examination to be held in 2024, 2025, 2026)

Course Code: UMJZOT401

**Major Course**

Course Title: Physiology of Controlling and Coordinating Systems

Credits: 04 {03(Theory) + 01(Practical)}

Total no. of lectures: Theory: 45 hours  
Practical: 30 hours

Maximum Marks: 100

Theory: 75

Practical/Tutorial: 25

Course Code: UMJZOT402

**Major Course**

Course Title: Parasitology

Credits: 04 {03(Theory) + 01(Practical)}

Total no. of lectures: Theory: 45 hours  
Practical: 30hours

Maximum Marks: 100

Theory: 75

Practical/Tutorial: 25

Course Code: UMJZOT403

**Major Course**

Course Title: Principles of Genetics

Credits: 04 {03(Theory) + 01(Practical)}

Total no. of lectures: Theory: 45 hours  
Practical: 30hours

Maximum Marks: 100

Theory: 75

Practical/Tutorial: 25

Course Code: UMJZOT404

**Major Course**

Course Title: Wildlife: Conservation and Management

Credits: 04 {03(Theory) + 01(Practical)}

Total no. of lectures: Theory: 45 hours  
Practical: 30hours

Maximum Marks: 100

Theory: 75

Practical/Tutorial: 25

Course Code: UMIZOT303

**Minor Course**

Course Title: Wildlife Biology

Credits: 04 {03(Theory) + 01(Practical)}

Total no. of lectures: Theory: 45 hours  
Practical: 30hours

Maximum Marks: 100

Theory: 75

Practical/Tutorial: 2



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**SYLLABI AND COURSE OF STUDY IN ZOOLOGY UNDER CBCS**  
**AS PER NEP - 2020**  
**(For the Examination to be held in Year 2024, 2025 & 2026)**  
**(MAJOR COURSE)**

**UG SEMESTER-IV**

MAJOR CORE COURSE NO.	:	UMJZOT401
MAJOR CORE COURSE TITLE:	PHYSIOLOGY OF CONTROLLING AND COORDINATING SYSTEMS	
CREDITS	:	04 {03 (THEORY) + 01 (Practical)}
MAXIMUM MARKS	:	75
I) External (University Exam)	:	60
II) Internal Assessment	:	15
DURATION OF UNIVERSITY EXAM	:	03 Hours
MAXIMUM MARKS PRACTICALS	:	25
I) Continuous Assessment	:	10
II) Final Examination	:	15

**Objectives and Expected Learning Outcomes**

The main objective of this course is to obtain knowledge about the functioning of various systems of organisms and their interrelationship for well-coordinated function. This course will provide an in depth study for better application of mind to further approach towards biology; would make students well equipped with the processes of body and its functioning and would help them in understanding both homeostasis mechanisms and homeostatic imbalances of various body systems.

**Unit 1: Neuro-physiology**

**(9 Hrs)**

- 1.1 Neuron: Structure and Classification
- 1.2 Synapses: Types and Functions
- 1.3 Nerve Impulse:
  - 1.3.1 Generation and transmission
  - 1.3.2 Factors affecting nerve impulse transmission
- 1.4 Synaptic Transmission, and neurotransmitters (Common types)

**Unit 2: Muscle Physiology**

**(9 Hrs)**

- 2.1 Muscular Tissue: Types, structure and characteristics
- 2.2 Ultrastructure of skeletal muscle and its chemical composition
- 2.3 Neuromuscular junction and Motor Unit
- 2.4 Molecular and chemical basis of muscle contraction



2.5 Red and White Skeletal Muscles

**Unit 3: Reproductive Physiology**

(12 Hrs)

- 3.1 Histology of mammalian testis and ovary
- 3.2 Spermatogenesis and oogenesis in Mammals
- 3.3 Menstrual Cycle in Primates
- 3.4 Fertilization: Types and Mechanism
- 3.5 Neuroendocrine control of Reproduction

**Unit 4: Homeostatic Physiology**

(15 Hrs)

- 4.1 Chemical nature of Hormones
- 4.2 Vertebrate Endocrine Glands: Pituitary, Thyroid, Parathyroid, Pancreas, and Adrenal; secretions and their actions, effect of hyposecretion and hypersecretion
- 4.3 Concept of Homeostasis and role of feedback mechanism in regulation of hormonal secretion
- 4.4 Osmoregulatory mechanisms
- 4.5 Thermoregulation

**Practicum**

(30 Hrs.)

1. Study of histology of Mammalian gonads (Testis and Ovary) using permanent Slides
2. Study of different stages of gametogenesis from permanent slides of mammalian gonads
3. Study of general morphology and histology of endocrine glands from permanent slides: Pituitary, Thyroid, Parathyroid, Pancreas and Adrenals
4. Preparation of permanent stained slide of skeletal muscle to study its structure
5. Recording of simple muscle twitch with electrical stimulation.
6. Study of different disorders of endocrine malfunction using charts / photographs

