

UNIVERSITY OF KOTA

FACULTY OF SCIENCE

B. SC. (PASS COURSE)

ZOOLOGY

SYLLABUS AND SCHEME OF SEMESTER EXAMINATION FOR THE ACADEMIC YEAR

2025-26



Semester-III : July - December 2025

Semester-IV : January - June 2026

UNIVERSITY OF KOTA

MBS Marg, Near Kabir Circle, Kota (Rajasthan) 324005

Syllabus Edition: 2025 (as per NEP 2020)

University of Kota
Bachelor of Science (B. Sc.)
Subject/Discipline: Zoology
Scheme of Semester III & IV

Year/ Semester	Course Code	Credits	Duration of Exam.	Maximum Marks		Minimum Marks	
				Semester Exam.	Continuous Assessment	Semester Exam.	Continuous Assessment
Year 2/ Sem-III	ZOO5234T	4	3 hrs.	70	30	28	12
	ZOO5234P	2	6 hrs.	50		25	
	Total	6		150		40+25	
Year 2/ Sem-IV	ZOO5234T	4	3 hrs.	70	30	28	12
	ZOO5234P	2	6 hrs.	50		25	
	Total	6		150		40+25	

Detailed Scheme of Continuous Assessment and End of Semester Examination (EoSE) for the Semester-III & IV

Scheme of Continuous Assessment: The theory paper will be continuously evaluated for 30 marks, with the remaining 70 marks allocated to external evaluation. The proposed distribution of marks for continuous and external assessment is as follows:

Continuous Assessment Weightage					External Assessment Weightage	Total Marks (Total Credits)
Regular Students		Private Students		Total	Paper based External Evaluation	
Mid-Term	Seminar/Project Report/Presentation	Report Writing	Viva-voce			
20	10	20	10	30	70	100 (4)

Regular students will have a mid-term test worth 20 marks. They will have one opportunity to improve their marks on the mid-term test by paying a fee of Rs. 250/- per paper, with approval from the competent authority of the College/Department of University.

Additionally, regular students must prepare a seminar/project report/presentation on a given topic and submit it to the College or Department of University.

Private students of UG will prepare a report of a minimum of 1000 words on a topic from the prescribed syllabus of the Zoology theory paper of the concerned semester. They will need to submit the Continuous Assessment Report (CAR) to the concerned college at the stipulated time.

The report should cover the following information:

1. Name of Course:
2. Name of Student:
3. Father's Name:
4. Examination Form No:
5. Name of College (Centre):
6. Name of Paper:
7. Title of the Topic (Project Report):
8. No. of Unit of Topic (as per prescribed syllabus):
9. Introduction about the Topic:
10. Detail/Analysis about the Topic:
11. Conclusion of the Topic:
12. References

Scheme of End of Semester Examination (EoSE) Paper:

At the end of the semester, there will be two papers for examination: a theory paper and a practical paper. The theory paper will be divided into two parts: Part A and Part B.

Part A will have 10 compulsory questions, with two questions from each unit. Answers to each question should be limited to 20 words, and each question carries two marks, making a total of 20 marks for Part A.

Part B will consist of 10 questions, with at least two questions from each unit and internal choice. Students will need to answer five questions, selecting at least one from each unit. Answers to each question should be limited to 400 words, and each question carries 10 marks, making a total of 50 marks for Part B

Question No.	PART-A	Marking (10x2=20)
1.	(i)	2
	(ii)	2
	(iii)	2
	(iv)	2
	(v)	2
	(vi)	2
	(vii)	2
	(viii)	2
	(ix)	2
	(x)	2
Question No.	PART-B	Marking (5x10=50)
2.	Unit-I	10
	OR	
3.	Unit-I	
4.	Unit-II	10
	OR	
	Unit-II	
6.	Unit-III	10
	OR	
	Unit-III	
8.	Unit-IV	10
	OR	
	Unit-IV	
10.	Unit-V	10
	OR	
	Unit-V	

The practical paper will follow the examination scheme based on the theory paper's syllabus for the subject.

NOTE: A student will have to pass in Continuous Internal Assessments (CIA), End of Semester Examination (EoSE), and Practical Examination separately.

University of Kota
Bachelor of Science (B. Sc.) Program
Subject/Discipline: Zoology
Syllabus: B. Sc. Semester-III

Course Code	Type of the Course	Title of the Course	Level of the Course
ZOO5234T	Core	Cell Biology and Genetics	5
Credit of the Course	Delivery of the Course		
4	Lectures: 60 lectures including diagnostic and formative assessments during lecture hours.		
Delivery Sub-Type of the Course	Theory/Tutorial (T)		
Pre-requisites/ Co-requisites	Semester-I and II/equivalent		
Objective of the Course	<ul style="list-style-type: none"> • Cell structure and function: understanding the structure and function of cells, organelles, and membranes, and how they work together to generate and use energy. • Cell processes: understanding the processes of cell growth, death, specialization, and motility, and how they contribute to the development of multicellular organisms. • Genetics: understanding the organization and development of genetic makeup and how to apply this knowledge to genetic diseases. • Molecular biology: understanding the molecular mechanisms that regulate and function biomolecules and how to use model systems to study them. • Communication: being able to communicate fundamental concepts of cell biology and genetics to a target audience. • Experimental procedures: being able to follow experimental methods to examine biomolecules accurately. • Data analysis and presentation: being able to analyze and presentation of scientific data and come to reasoned conclusions. 		
Course Learning Outcomes	<ul style="list-style-type: none"> • Cell structure and function: students learn about the components of cells, such as organelles, membranes, and macromolecules, and how they work together to generate and use energy. • Genetics: students learn how genetic information is inherited, used, and controlled in cells. They also learn about gene interactions, multiple alleles, and sex-linked inheritance. • Cell biology and genetics concepts: students learn how to apply cell biology and genetics concepts to explain practical applications, analyze data, and draw conclusions. • Laboratory techniques: students learn how to apply laboratory and analytical techniques to investigate questions in cell biology. • Communication: students learn how to communicate cell biology and genetics concepts to a target audience. • Molecular mechanisms: students learn about the molecular mechanisms that regulate genome maintenance and gene expression. 		

Detailed Syllabus of Theory Paper: B. Sc. (Semester-III) Zoology
ZOO5234T: CELL BIOLOGY AND GENETICS (60 Lectures & 4 Credits)

Unit - I (Introduction to the Cell)

The chronology of cell biology, cell theory, concept and perspective of the prokaryotic and eukaryotic cell, elementary idea of an animal cell, characteristics and chemical composition of protoplasm, structure and functions of the plasma membrane.

Unit- II (Components of the Cell)

Morphology, structure, and function of nucleus, nucleolus, endoplasmic reticulum, mitochondria, ribosomes, Golgi complex, lysosomes, centrosome, and cytoskeleton.

Unit- III (Cell division and Protein synthesis)

Cell cycle: phases and regulative mechanism, Mitosis: characteristics, steps, checkpoints, and significance; Meiosis: characteristics, phases, checkpoints, significance, linkage, and crossing over. DNA replication, genetic code, transcription and translation.

Unit - IV (Mendelian and Post-Mendelian concepts of heredity)

Genetics: timeline of key events, Mendel's inheritance laws, the current status and significance of Mendel's inheritance work, incomplete dominance, co-dominance, multiple alleles, lethal genes, gene interactions, pleiotropic gene effects, polygenes, environmental, and maternal effects.

Unit - V (Contemporary trends in genetics)

Mutations: characteristics, types, causes, mutagens, significance, and molecular basis of mutations. Sex determination: types, sex determination system and mechanism, common genetic disorders, sex chromosomes linked inheritance, and pedigree analysis in humans. Elementary idea of human genomics

Recommended text and reference books:

1. Cell and Molecular Biology: E.D.P de Robertis, Lippincott Williams & Wilkins
2. Cell Biology: CB Powar, Himalaya Publishing House
3. Concepts of Genetics: William S. Klug, Pearson Publication
4. Fundamental of Genetics: BD Singh, Medtech Publication
5. Fundamentals of Genomics: Victor Kennedy, Larsen and Keller Education Publisher
6. Genetics: PK Gupta, Rastogi Publication
7. Genetics: Veer Bala Rastogi, Medtech Publication
8. Genomics Fundamentals & Applications: Choudhuri and Carlson, Taylor & Francis
9. Karp's Cell and Molecular Biology: Gerald Karp
10. Lewin's Genes XI: Jocelyn E. Krebs, Jones and Bartlett India Pvt.
11. Molecular Biology of the Cell: Bruce Albert
12. Molecular Cell Biology: David Baltimore and Harvey Lodish
13. Principles of Genetics: Gardner
14. Principles of Genetics: Gardner, Simmons & Snustad, Wiley Student Edition
15. Text Book of Cell Biology & Genetics: Veer Bala Rastogi, KNRN Publishing
16. The Cell-A Molecular Approach: Geoffrey M. Cooper

Hyperlinks/URL/Web Resources for B. Sc. (Semester-III) Zoology

1. <https://egyankosh.ac.in/handle/123456789/25097>
2. <https://bio.libretexts.org/>
3. <https://www.ebookselibrary.com/books/higher-education/zoology>
4. <https://epgp.inflibnet.ac.in/Home/ViewSubject?catid=2rAs1Puvga4LW93zMe83aA==>
5. <https://ndl.iitkgp.ac.in/account/registration>
6. <https://www.youtube.com/@cecgurukul/playlists>
7. <https://www.swayamprabha.gov.in/index.php/higheredu>
8. <https://swayam.gov.in/>
9. <https://www.ebsco.com/academic-libraries>
10. <https://www.coursera.org/courses?query=zoology>
11. <https://uj.ac.za.libguides.com/zoology/home>
12. <https://onlinelibrary.wiley.com/>
13. <https://biosphera3d.com/>
14. <https://www.vlab.co.in/>
15. <https://www.sciencedirect.com/book/9780080187679/zoology>
16. https://tripurauniv.ac.in/Page/SubjectWiseOnline_EBooks_Zoology_and_Animal_Science
17. <https://www.freebookcentre.net/Biology/Zoology-Books.html>

**Detailed Syllabus of Practical Paper: B. Sc. (Semester-III) Zoology
ZOO5234P: LAB COURSE/PRACTICALS (60 hrs. & 2 Credits)**

Cell Biology:

1. Study of cell membrane permeability.
2. Acetocarmine preparation for mitotic activity.
3. Study of mitosis in onion root tip cells and meiosis in young anther/testis of Cockroach.
4. Mitotic and meiotic cell division study through permanent slides.
5. Demonstration of mitochondria using vital stain.
6. Study of giant chromosomes in salivary glands of *Chironomus/Drosophila larvae*.
7. Study of DNA by separation using detergent followed by staining.

Genetics:

1. Simple numerical problems based on monohybrid/dihybrid cross.
2. Life cycle of *Drosophila* and its culture in laboratory.
3. Identification of male and female *Drosophila*, wild and mutant *Drosophila*: Yellow-brown/Ebony, Red/White-eyed and Straight/Vestigial wings.
4. Preparation of slides of sex combs of adult *Drosophila* and polytene chromosomes from salivary glands of *Drosophila larvae*.
5. Study of Barr body/Sex chromatin in buccal cavity cells/leucocytes.

Recommended Books for Practical

1. Cell Biology-A Practical Manual: Dr. Renu Gupta, Prestige Books Publisher
2. Cell and Molecular Biology-A Lab Manual: KV Chaitanya, PHI Learning
3. Genetics- A Laboratory Manual: Gregore Koliantz & Daniel B. Szymanski

University of Kota

B. Sc. (Semester-III) Zoology Practical

Scheme of Practical Examination and Distribution of Marks

Duration: 6 Hrs.

Maximum Marks: 50

Minimum Marks: 25

S. N.	Exercise in Practical Examination	Marks (Reg./Ex/NC)
1.	Cell Biology	07
2.	Genetics	07
3.	Identification & Comments on Spots (1-5)	20
4.	Laboratory Record	10
5.	<i>Viva-Voce</i>	06
	TOTAL	50

सैद्धांतिक प्रश्न-पत्र का विस्तारित पाठ्यक्रम: बी.एससी (सेमेस्टर-III) प्राणीशास्त्र
ZOO5234T: कोशिका जीव विज्ञान एवं आनुवंशिकी (60 व्याख्यान & 4 क्रेडिट्स)

इकाई-I (कोशिका का परिचय)

कोशिका जीवविज्ञान का स्वर्णिम युग, कोशिका सिद्धांत, असीमकेन्द्रकी एवं ससीमकेन्द्रकी कोशिका की संकल्पना एवं परिपेक्ष्य, प्राणी कोशिका की प्रारम्भिक जानकारी, जीवद्रव्य की विशेषताएँ एवं रासायनिक संगठन, कोशिका झिल्ली की संरचना एवं प्रकार्य ।

इकाई-II (कोशिका के घटक)

केन्द्रक (न्यूक्लियस), केन्द्रिका (न्यूक्लियोलस), एंडोप्लाज्मिक रेटिकुलम, माइटोकॉन्ड्रिया, राइबोसोम, गोल्गी कॉम्प्लेक्स, लाइसोसोम, सेंट्रोसोम और साइटोस्केलेटन की आकृति विज्ञान, संरचना और कार्य।

इकाई-III (कोशिका विभाजन और प्रोटीन संश्लेषण)

कोशिका चक्र: प्रावस्थाएँ एवं नियमनकारी क्रियाविधि, समसूत्री विभाजन: विशेषताएँ, सोपान, नियंत्रण स्थल एवं महत्व, अर्धसूत्री विभाजन: विशेषताएँ, प्रावस्थाएँ, नियंत्रण स्थल, महत्व, सहलग्नता व जीन विनिमय; डीएनए प्रतिकृतिकरण, आनुवंशिक कूट, अनुलेखन और अनुवादन ।

इकाई-IV (वंशागति की मेंडेलियन एवं पश्व-मेंडेलियन संकल्पनाएँ)

आनुवंशिकी: मुख्य घटनाओं का समयोचित, मेंडल के वंशागति के नियम, मेंडल के वंशागति कार्य की वर्तमान स्थिति एवं महत्व, अपूर्ण प्रभाविता, सह-प्रभाविता, बहुयुग्मविकल्पी, घातक जीन्स, जीन अन्तर्क्रिया, बहुप्रभावी जीन, बहुजीन्स, पर्यावरणीय और मातृक प्रभाव ।

इकाई-V (आनुवंशिकी में समकालीन प्रवृत्तियाँ)

उत्परिवर्तन: विशेषताएँ, प्रकार, कारण, उत्परिवर्तजन, महत्व तथा उत्परिवर्तन का आण्विक आधार । लिंग निर्धारण: प्रकार, लिंग निर्धारण तंत्र एवं क्रियाविधि । मानव में सामान्य आनुवंशिक संलक्षण, लिंग गुणसूत्र सहलग्न वंशागति और वंशावली विश्लेषण । मानव जीनोमिक्स की प्रारम्भिक जानकारी ।

अनुशासित पाठ्यपुस्तकें:

1. कोशिका जीव विज्ञान: वीर बाला रस्तोगी, केएनआरएन प्रकाशन
2. आनुवंशिकी: वीर बाला रस्तोगी, केएनआरएन प्रकाशन
3. कोशिका जीव विज्ञान एवं आनुवंशिकी: कॉलेज बुक सेंटर
4. कोशिका जीव विज्ञान एवं आनुवंशिकी: आरबीडी प्रकाशन
5. कोशिका जीव विज्ञान एवं आनुवंशिकी: सीबीएच प्रकाशन
6. कोशिका जीव विज्ञान एवं आनुवंशिकी: अल्का प्रकाशन

**प्रायोगिक प्रश्न-पत्र का विस्तारित पाठ्यक्रम: बी.एससी (सेमेस्टर-III) प्राणीशास्त्र
ZOO5234P: प्रयोगशाला कोर्स/प्रायोगिक (60 घण्टे & 2 क्रेडिट्स)**

कोशिका जीवविज्ञान

1. कोशिका झिल्ली पारगम्यता का अध्ययन ।
2. समसूत्री विभाजन क्रिया के लिए एसीटोकार्मिन का विरचन ।
3. प्याज की मूलाग्र कोशिकाओं में समसूत्री विभाजन एवं तरुण परागकोश / कॉकरोच के वृषण में अर्धसूत्री विभाजन का अध्ययन ।
4. स्थायी स्लाइड्स से समसूत्री एवं अर्धसूत्री विभाजन का अध्ययन ।
5. जैविक अभिरंजन के उपयोग से सूत्रकणिका का प्रदर्शन ।
6. काइरोनोमस/ड्रोसोफिला डिम्बक की लारीय ग्रंथियों में पॉलीटीन गुणसूत्रों का अध्ययन ।
7. डीएनए का अपमार्जक के उपयोग से पृथक्करण कर अभिरंजन द्वारा अध्ययन करना ।

आनुवंशिकी:

1. एकल संकरण एवं द्विसंकरण आधारित सरल संख्यात्मक समस्याएँ ।
2. ड्रोसोफिला का जीवन चक्र एवं प्रयोगशाला में इसका संवर्धन ।
3. नर व मादा और वन्य व उत्परिवर्ती पीली-भूरी, /आबनूसी, लाल/श्वेत नेत्र, सीधे/अवशेषी पंख ड्रोसोफिला की पहचान करना ।
4. वयस्क ड्रोसोफिला से लिंग कंकत तथा ड्रोसोफिला डिम्बक की लारीय ग्रंथियों से पॉलीटीन गुणसूत्रों की स्लाइड का विरचन ।
5. बॉर बॉडी/सेक्स क्रोमैटिन का मुख गुहिका कोशिकाओं/श्वेताणुओं में अध्ययन ।

कोटा विश्वविद्यालय

**बी.एससी (सेमेस्टर-III) प्रायोगिक प्राणीशास्त्र
प्रायोगिक परीक्षा की योजना एवं अंको का वितरण**

अवधि: 6 घण्टे

पूर्णांक: 50

उत्तीर्णांक: 25

क्र. सं	प्रायोगिक परीक्षा में अभ्यास	अंक (Reg./Ex/NC)
1	कोशिका जीव विज्ञान	07
2	आनुवंशिकी	07
3	प्रादर्शों की पहचान एवं टिप्पणी (1-5)	20
4	प्रयोगशाला अभिलेख	10
5	मौखिक	06
	कुल	50

University of Kota
Bachelor of Science (B. Sc.) Program
Subject/Discipline: Zoology
Syllabus: B. Sc. Semester-IV

Course Code	Type of the Course	Title of the Course	Level of the Course
ZOO5234T	Core	Mammalian Physiology and Endocrinology	5
Credit of the Course	Delivery of the Course		
4	Lectures: 60 lectures including diagnostic and formative assessments during lecture hours.		
Delivery Sub-Type of the Course	Theory/Tutorial (T)		
Pre-requisites/ Co-requisites	Semester-III/equivalent course		
Objective of the Course	<ul style="list-style-type: none"> • Students will study the physiological fundamentals of animal systems, including the digestive, cardiovascular, respiratory, renal, nervous, endocrine, and reproductive systems. • They will also learn about how the body maintains homeostasis and physiological adaptations. • Additionally, students will study the chemical composition of hormones and the mechanisms and effects of hormones from the pituitary, thyroid, parathyroid, adrenal, and pineal glands. • The course will also cover the use of scientific terminology specific to the subject and basic scientific instrumentation in laboratory settings. • Finally, students will learn how to perform functional tests on animals and interpret the results. 		
Course Learning Outcomes	<ul style="list-style-type: none"> • Students will gain an understanding of animal physiology, including the fundamental principles and their application to different animal groups. • They will also learn about the endocrine system and how it interacts with other systems. • Additionally, students will study hormonal regulation in vertebrates and invertebrates as well as experimental methods and designs for research. • The course will cover the roles of enzymes, vitamins, and other essential nutrients, including their sources, significance, and potential deficiencies. • Furthermore, students will explore the muscular system and the neuroendocrine regulation of animal growth, development, and metabolism. • Finally, the functions of animal physiological systems, such as digestion, cardio-respiratory, and renal systems, will be discussed. 		

Detailed Syllabus of Theory Paper: B. Sc. (Semester-IV) Zoology
ZOO5234T: MAMMALIAN PHYSIOLOGY & ENDOCRINOLOGY
(60 Lectures & 4 Credits)

Unit - I (Digestive system and Respiratory system)

Alimentary canal and digestive glands, digestion of various foodstuffs in different parts of the alimentary canal, absorption and assimilation of end products of digestion, and hormonal regulation of digestion. Morphology and structure of respiratory organs, structure and functions of hemoglobin, mechanism of breathing, gaseous exchange, transport of gases, respiratory volumes, control of respiration, and common respiratory disorders.

Unit - 2 (Cardiovascular system and Excretory System)

Composition and circulation of blood and lymph, heart morphology, anatomy, and physiology; origin and conduction of cardiac impulse, heart beat and heart rate, cardiac cycle, ECG, blood pressure, blood groups, Rh-factor, and common cardiac disorders. Morphology, anatomy, and physiology of kidneys; structure of nephron, mechanism of urine formation, composition of urine, micturition, common diseases of urinary tract.

Unit - 3 (Muscular system and Nervous system)

Muscles: types, properties, structure and functions; molecular ultrastructure of a muscle fiber; theories of muscle contraction and relaxation; common diseases of muscular system. Neural system: parts and ventricles of brain; types, properties, structure and functions of neurons; origin and propagation of nerve impulse; synapses: types, structure and mechanism; neurotransmitters: properties, types, structure and functions; reflex actions, and common abnormalities of the neural system.

Unit - 4 (Reproductive System)

Structure and function of male and female reproductive system, menstrual and estrus cycle, menarche and menopause, hormonal regulation of reproductive organs, assisted reproductive technology: IVF; GIFT; ZIFT; ICSI; and Cryopreservation, birth control devices, and common diseases of male and female reproductive system.

Unit – 5 (Endocrine System)

Hormones: properties, classification, types, and mechanism of action; endocrine glands: morphology, anatomy, and physiology of hypothalamus, pituitary, pineal, thyroid, parathyroid, thymus, adrenal, pancreas, ovary, testis, placenta, gastro-intestinal tract, kidney, heart, and salivary gland; regulation of hormone secretion; positive and negative feedback control mechanisms.

Recommended text and reference books:

1. Animal Physiology-Adaptation and Environment: Schmidt-Nielsen
2. Animal Physiology: Richard W. Hill
3. Animal Physiology: Shastri & Shukla, Rastogi Publication
4. Eckert Animal Physiology: David Randall & Kathleen French
5. Endocrinology, 6th Edition: Hadley
6. Essentials of Animal Physiology: Rastogi Publication
7. General Endocrinology 6/e: CD Turner
8. Textbook of Medical Physiology: Guyton & Hall, Third South Asia Edition

9. Textbook of Physiology 10ed (Vol-1 & Vol-2), AK Jain

10. Williams Textbook of Endocrinology, 15/e: Shlomo Melmed

Hyperlinks/URL/Web Resources for B. Sc. (Semester-IV) Zoology

1. <https://www.ebsco.com/academic-libraries>
2. <https://www.ebookselibrary.com/books/higher-education/zoology>
3. <https://egyankosh.ac.in/handle/123456789/25097>
4. <https://bio.libretexts.org/>
5. <https://epgp.inflibnet.ac.in/Home/ViewSubject?catid=2rAs1Puvga4LW93zMe83aA==>
6. <https://ndl.iitkgp.ac.in/account/registration>
7. <https://www.youtube.com/@cecgurukul/playlists>
8. <https://www.swayamprabha.gov.in/index.php/higheredu>
9. <https://swayam.gov.in/>
10. <https://uj.ac.za.libguides.com/zoology/home>
11. <https://biosphera3d.com/>
12. <https://www.vlab.co.in/>
13. <https://www.sciencedirect.com/book/9780080187679/zoology>
14. https://tripurauniv.ac.in/Page/SubjectWiseOnline_EBooks_Zoology_and_Animal_Science
15. <https://www.freebookcentre.net/Biology/Zoology-Books.html>
16. <https://onlinelibrary.wiley.com/>
17. <https://www.coursera.org/courses?query=zoology>

**Detailed Syllabus of Practical Paper: B. Sc. (Semester-IV) Zoology
ZOOL5234P: LAB COURSE/PRACTICALS (60 hrs. & 2 Credits)**

Physiology

- Study of mammalian histological slides: T.S. of Stomach, Intestine, Liver, Pancreas, Kidney, Lung & Spinal cord, V.S. of skin, Striated, Smooth and Cardiac muscle fiber.
- Study of Balance diet, Malnutrition, Obesity, Endoscopy, Catalyze and Ptyalin enzyme activity
- Spirometry
- Identification of blood group: ABO and Rh factors).
- Estimation of Red Blood Corpuscles and White Blood Corpuscles
- Preparation of blood film, Clotting Time, Bleeding Time
- Hemoglobin estimation and Hematocrit value
- ECG & Cardiac cycle
- EEG, MRI, CT- Scan
- Mental health: epilepsy, neurosis & psychosis

Endocrinology:

- Demonstration of major endocrine glands using models/charts/computer software.
- Study of histology of major endocrine glands: T.S./L.S. of pituitary, thyroid, parathyroid, adrenal, pancreas, testes, ovary, and placenta
- Disorders related to endocrine glands.

Visit to Medical College/Pathology Lab.

Recommended books for the practical work:

- Biochemistry and Physiology of Animal with Practical: KC Gupta
- Essentials in Hematology and Clinical Pathology: Ramadas Nayak & Sharada Rai
- Practical Manual of Hematology: Kamat Girish
- Textbook of Practical Physiology (5th Edn): GK Pal & Pravati Pal

University of Kota

B. Sc. (Semester-IV) Zoology Practical

Scheme of Practical Examination and Distribution of Marks

Duration: 6 Hrs.

Maximum Marks: 50

Minimum Marks: 25

S. N.	Exercise in Practical Examination	Marks (Reg./Ex/NC)
1.	Physiological exercise	07
2.	Hematological exercise	07
3.	Identification & Comments on Spots (1-5)	20
4.	Laboratory Record	10
5.	<i>Viva-Voce</i>	06
	TOTAL	50

सैद्धांतिक प्रश्न-पत्र का विस्तारित पाठ्यक्रम: बी.एससी (सेमेस्टर-IV) प्राणीशास्त्र
ZOOL5234T: स्तनी कार्यिकी एवं अन्तःस्रावी विज्ञान (60 व्याख्यान & 4 क्रेडिट्स)

इकाई-I (पाचन तंत्र एवं श्वसन तंत्र)

आहारनाल एवं पाचक ग्रंथियाँ, विभिन्न प्रकार के भोज्य पदार्थों का आहारनाल के भिन्न-भिन्न भागों में पाचन, पाचन के अंत्य उत्पादों का अवशोषण व स्वांगीकरण तथा पाचन का हॉर्मोनल नियमन। श्वसनी अंगों की आकारिकी एवं संरचना, हीमोग्लोबिन की संरचना एवं प्रकार्य, संवातन की क्रियाविधि, गैसों का विनिमय, गैसों का परिवहन, श्वसनी आयतन, श्वसन का नियंत्रण और सामान्य श्वसनी संलक्षण।

इकाई-II (हृदसंवहनी तंत्र एवं उत्सर्जन तंत्र)

रुधिर एवं लसीका का संगठन एवं परिसंचरण, हृदय की आकारिकी, संरचना एवं कार्यिकी; हृदय आवेग का उद्भव एवं संवहन, हृदय स्पंदन, हृदय दर, हृदय चक्र, ईसीजी, रुधिर दाब, रुधिर समूह व आरएच-कारक, सामान्य हृदय संलक्षण। वृक्कों की आकारिकी, संरचना एवं कार्यिकी; वृक्क नलिका की संरचना, मूत्र निर्माण की क्रियाविधि, मूत्र का संगठन, मूत्रण क्रिया तथा मूत्रपथ की सामान्य व्याधियाँ।

इकाई-III (पेशीय तंत्र एवं तंत्रिका तंत्र)

पेशियाँ: प्रकार, गुणधर्म, संरचना एवं प्रकार्य; पेशी तन्तु की आण्विक परासंरचना; पेशी संकुचन एवं शिथिलन के सिद्धांत तथा पेशी तंत्र की सामान्य व्याधियाँ। तंत्रिकीय तंत्र: मस्तिष्क के भाग व निलय; तंत्रिका कोशिकाओं के प्रकार, गुणधर्म, संरचना एवं प्रकार्य; तंत्रिका आवेग का उद्भव एवं प्रवर्धन; अन्तर्ग्रथन: प्रकार, संरचना व क्रियाविधि; तंत्रिकाप्रेषी: गुणधर्म, प्रकार, संरचना एवं प्रकार्य; प्रतिवर्ती क्रियाएँ तथा तंत्रिका तंत्र की अपसामान्यताएँ।

इकाई-IV (प्रजनन तंत्र)

नर एवं मादा प्रजनन तंत्र की संरचना एवं प्रकार्य, रज चक्र एवं मद चक्र, रजोदर्शन एवं रजोनिवृत्ति, प्रजनन अंगों का हॉर्मोनल नियमन, सहायप्रदत्त प्रजननीय तकनीक: आईवीएफ; जीआईएफटी; ज़ेडआईएफटी; आईसीएसआई एवं हिमतापीय परिरक्षण, जन्म नियंत्रण युक्तियाँ तथा नर व मादा प्रजनन तंत्र की सामान्य व्याधियाँ।

इकाई-V (अन्तःस्रावी तंत्र)

हॉर्मोन्स: गुणधर्म, वर्गीकरण, क्रिया का प्रकार व क्रियाविधि। अन्तःस्रावी ग्रंथियाँ: हाइपोथैलेमस, पीयूष, पिनीयल, थाइराइड, पराथाइराइड, थाइमस, अधिवृक्क, अग्नाशय, अँडाशय, वृषण, अपरा, जठरान्त्र पथ, वृक्क, हृदय तथा लारीय ग्रंथि की आकारिकी, संरचना एवं कार्यिकी। हॉर्मोन स्रवण का नियमन: धनात्मक व ऋणात्मक पुनर्भरण नियंत्रण क्रियाविधियाँ।

अनुशासित पाठ्यपुस्तकें:

1. जन्तु विज्ञान कार्यिकी एवं जैवरसायनिकी: सक्सेना एवं दीक्षित, आरपी यूनिफ़ाइड प्रकाशन
2. जन्तु विज्ञान कार्यिकी एवं जैवरसायनिकी: आरपीएच प्रकाशन

3. जन्तु विज्ञान कार्याकी एवं जैवरसायनिकी: ठाकुर प्रकाशन लिमिटेड
4. प्राणी कार्याकी: केसी सोनी, सीबीसी प्रकाशन
5. जैवरसायन एवं प्राणी शरीर क्रिया विज्ञान: रस्तोगी प्रकाशन

**प्रायोगिक प्रश्न-पत्र का विस्तारित पाठ्यक्रम: बी.एससी (सेमेस्टर-IV) प्राणीशास्त्र
ZOO5234P: प्रयोगशाला कोर्स/प्रायोगिक (60 घण्टे & 2 क्रेडिट्स)**

1. स्तनी कार्याकी:

- a) स्तनी औतिकीय स्लाइड्स का अध्ययन: आमाशय, आंत्र, यकृत, अग्नाशय, वृक्क, फुफ्फुस एवं मेरुरज्जु की अनुप्रस्थ काट, त्वचा की उदग्र काट, रेखित, अरेखित एवं हृद पेशी तंतुक ।
- b) संतुलित आहार, कुपोषण, मोटापा, अंतरीक्षा, कैटेलेज एवं टायलीन प्रकिण्व क्रिया का अध्ययन ।
- c) श्वसनमिति
- d) रूधिर समूह की पहचान करना: ABO एवं आरएच-कारक ।
- e) लाल रूधिर कणिकाओं एवं श्वेत रूधिर कणिकाओं का आकलन करना ।
- f) रूधिर फिल्म, स्कन्दन समय एवं रूधिर स्राव समय का अध्ययन ।
- g) रूधिर हीमोग्लोबिन एवं हिमेटोक्रिट मान ज्ञात करना ।
- h) ईसीजी एवं हृद चक्र
- i) ईईजी, एमआरआई एवं सीटी-स्कैन
- j) मानसिक स्वास्थ्य: अपस्मार/तंत्रिकाताप/मतिभ्रंश

2. अन्तःस्राविकी

- a) मॉडल्स/चार्ट्स/कंप्यूटर द्वारा प्रमुख अन्तःस्रावी ग्रंथियों का प्रदर्शन ।
- b) प्रमुख अन्तःस्रावी ग्रंथियों की औतिकी का अध्ययन: पीयूषिका, अवटु, परावटु, अधिवृक्क, अग्नाशय, वृषण, अंडाशय एवं अपरा ।
- c) अन्तःस्रावी ग्रन्थि संबन्धित संलक्षण ।

3. आयुर्विज्ञान महाविद्यालय/रोगविज्ञान प्रयोगशाला का भ्रमण

कोटा विश्वविद्यालय

**बी.एससी (सेमेस्टर-IV) प्रायोगिक प्राणीशास्त्र
प्रायोगिक परीक्षा की योजना एवं अंको का वितरण**

अवधि: 6 घण्टे

पूर्णांक: 50

उत्तीर्णांक: 25

क्र. सं	प्रायोगिक परीक्षा में अभ्यास	अंक (Reg./Ex/NC)
1.	शरीर-कार्याकी अभ्यास	07
2.	रूधिर विज्ञान अभ्यास	07
3.	प्रादर्शों की पहचान एवं टिप्पणी (1-5)	20
4.	प्रयोगशाला अभिलेख	10
5.	मौखिक	06
	कुल	50