ADIKAVI SRI MAHARSHI VALMIKI UNIVERSITY, RAICHUR

SYLLABUS

B.Sc. Three Year Degree Program for the Subject

ZOOLOGY

With Effect from 2024-25

DISCIPLINE SPECIFIC CORE COURSE (DSC) FOR SEM I-IV, SKILL ENHANCEMENT COURSE (SEC) FOR SEM IV/V/VI and ELECTIVE COURSES FOR SEM V AND VI

AS PER N E P (Revised): 2024

Zoology

B.Sc., Semester – III (SEP) w.e.f. 2025-26

Theory Syllabus

Course Title: **Histology, Physiology and Biochemistry**	Course Code:
Total Contact Hours: 64	No. of Credits: T=4
L:P	4:0
Internal Assessment Marks: 20	Duration of SEE: 3 Hours
Semester End Exam Marks: 80	

Course Outcomes (COs):

At the end of the course, students will be able to:

9. Attain operating skills of different kinds of microscopes.
10. Demonstrate different types of tissues.
11. Explain structural and functional differences among histological slides.
12. Describe the physiology of organ systems in human beings.
13. Appreciate and relate the mechanism of nervous control and coordination.
14. Gain the structural knowledge of bimolecular.
15. Illustrate different pathways in the biochemistry.
16. Distinguish healthy and unhealthy lifestyles of human beings.

Units	Description	Hours
1	*Histology*: General principles, resolution and operation of simple, compound, phase contrast and dark field microscopy. Staining techniques. Study of tissues: Epithelial, connective, muscular and nerve tissue. Working mechanism of microtome. Picto-micrographic study of major human organ histology; Stomach, Small Intestine, Liver, Pancreas, Thyroid, Spleen, Testis and Ovary.	16
2	*Physiology*:*Digestive system*: Structural organization and functions of gastrointestinal tract and associated glands of human. Mechanical and chemical digestion of food; Absorption of carbohydrates, lipids, proteins, water, minerals and vitamins. Mechanism of respiration, Pulmonary ventilation; Respiratory volumes and capacities; Transport of oxygen and carbon dioxide in blood, Respiratory pigments, Dissociation curves and the factors influencing	16

	it. Control of respiration.	
3	*Circulation and Excretion in humans*: Structure of mammalian heart cardiac cycle; cardiac output and its regulation, Electrocardiogram, Blood Pressure and its regulation. Structure of kidney and nephron; mechanism of urine formation. *Nervous system*: Structure of neurons, Neurotransmitters, transmission of nerve impulse along axon.*HumanEndocrine system*: Hormones and their functions of endocrine glands.	16
4	*Biochemistry:* *Structure and Function of Biomolecules***:** Structure and biological importance of carbohydrates (Monosaccharides, Oligosaccharides, Polysaccharides and Glycoconjugates). Structure, classification and general properties of amino acids; Essential and non-essential amino acids. Lipids (saturated and unsaturated Fatty acids, Tri-acylglycerols, Phospholipids, Glycolipids and Steroids) *Metabolism of Carbohydrates*: Glycolysis, Citricacid cycle, gluconeogenesis, phosphate pentose pathway,glycogenolysis and glycogenesis. Lipids biosynthesis of palmitic acid; Ketogenesis. *Metabolism of Proteins and Nucleotides:*Catabolism of amino acids: Trans-amination, de-amination, Ureacycle, Nucleotides and vitamins.	16

Suggested Reading:

14. Nelson & Cox: Leininger's Principles of Biochemistry: McMillan (2000)
15. Voet &Voet: Biochemistry Vols l & 2: Wiley (2004)
16. Murray Harper's Illustrated Biochemistry: McGraw Hill (2003)
17. Elliott and Elliott: Biochemistry and Molecular Biology: Oxford University Press
18. Guyton, A.C. & Hall, J.E.: Textbook of Medical Physiology 11th Edition, Hercourt Asia Pvt. Ltd. W.B. Saunders Company. (2006).
19. Tortora, G.J. & Grabowski, S. Principles of Anatomy & Physiology. XI Edition John Wiley & sons (2006).
20. Christopher D. Moyes, Patricia M. Schulte. Principles of Animal Physiology. 3rd Edition, Pearson Education (2016).
21. Neelam Vasudeva and Sabita Mishra: Inderbir Singh's text book of human physiology, Jaypee brothers' medical publishers pvt. ltd., New Delhi.
22. Chatterjee CC: Human Physiology Volume l & 2, 11th edition, CBS Publishers (2016)
23. Carlton H.M: Histological techniques for normal and pathological tissues, Oxford University press.

Internal Assessment for Theory	
Assessment type	Marks
First Test / Presentation / Project / Seminars / Assignment	10
Second Test / Presentation / Project / Seminars / Assignment	10
Total	20

Zoology
B.Sc., Semester – III (SEP)
Practical Syllabus

Course Title: **Histology, Physiology and Biochemistry**	Course Code:
Total Contact Hours: 64	No. of Credits: P=2
Contact hours per week: 4	L:P (0:4)
Internal Assessment Marks: 10	Duration of SEE: 3 Hours
Semester End Exam Marks: 40	

Course Outcomes (COs):

At the end of the course, students will be able to:

13. Understand procedures of qualitative analysis.
14. Perform chemical tests for bimolecular and physiological samples.
15. Develop the skills count animal cells and draw to the health conditions.
16. Gain the skills of designing the models of molecules.
17. Enhancement to f basic laboratoryskilllikekeen observation and drawing.
18. Demonstrate the use of biological equipment.
19. Take up research in biological sciences.
20. Realize and differences in histological slides.
21. Get a flavor of research by working on projectsalong with their writing skills.
22. Think and interpret individually and independently.

Name of the Experiments
1. Permanent histological slide preparation using standard methods.
2. Study of the T.S. of Liver, Pancreas, Stomach, Small intestine, Thyroid and Spleen.
3. Study of mammalian Testis, ovary and accessory reproductive organs.
4. Action of salivary amylase under optimum conditions.
5. Estimation of Hemoglobin in human blood using Sahli' shaemoglobinometer.
6. Counting of RBC in blood using Hemocytometer.
7. Counting of WBC in blood using Hemocytometer
8. Differential staining of human blood corpuscles using Leishman stain.
9. Recording of blood glucose level by usingglucometer.
10. Study of pulse rate and blood pressure in normal and altered clinical conditions.
11. Qualitative analysis of Carbohydrates, Proteins and Lipids.
12. Qualitative analysis of Nitrogenous wastes – Ammonia, Urea and Uric acid.
13. Separation of amino acids or proteins by paper chromatography.
14. Preparation of models of nitrogenous bases- nucleosides and nucleotides.
15. Preparation of models of amino acids and different types of bonds.
16. Preparation of DNA and RNA models.

*Note: Students should draw the diagrams rather than just pasting the pictures in the records. A minimum of 12 practical experiments to be performed by the student justifying the course title.

Internal AssessmentforPractical	
Assessmenttype	**Marks**
Test/Presentation/Project/Seminars	5
Laboratory Performance/Participation	5
Total	10

Semester End Practical Question Paper Pattern for UG Semester-III (Major)

Q.No.	Duration: 04 Hours	Max Marks: 40
1	Major Experiment	12
2	Minor experiment	08
3	Spotting/Identification	10
4	Record Book / Journal Submission	05
5	Viva	05

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