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III & IV

## RAICHUR UNIVERSITY, RAICHUR

## **BACHELOR OF SCIENCE IN ZOOLOGY**

## **PROPOSED SYLLABUS FOR III AND IV SEMESTERS**

2024-2025 Onwards

*[Signature]*

W. J. Clegg

23. May

**ಆದಿಕವಿ ಶ್ರೀ ಮಹಾರ್ಷಿ ವಾಲ್ಮೀಕಿ ವಿಶ್ವವಿದ್ಯಾನಿಲಯ, ರಾಯಚೂರು**  
**ADIKAVI SRI MAHARSHI VALMIKI UNIVERSITY, RAICHUR**  
Krishna Tunga Campus, Mantralay Road (N.H. 167), Yergera -584133, Raichur, Karnataka  
**ಶ್ರೀಕೃಷ್ಣರೇಖೆ ವಿಭಾಗ** Website: <https://raichuruniversity.ac.in>

ಸಂ.ಅಶ್ರೀಮಾವಿರಾ/ಶ್ರೀ/ಯುಜಿ/BOS/2025-26/

ದಿನಾಂಕ:

**ಕಚೇರಿ ಆದೇಶ**

ವಿಷಯ: 2025-26ನೇ ಶ್ರೀಕೃಷ್ಣರೇಖೆ ಸಾಲಿನ ಸ್ನಾತಕ (UG) ಕೋರ್ಸಗಳ SEP ಪತ್ರಕ್ಕು ತಯಾರಿಸಲು ನಿಯಮಿತ ಅಧ್ಯಯನ ಮಂಡಳ (BOS) ರಚಿಸುವ ಪರಿಪು

ಉಲ್ಲೇಖ: ಮಾನ್ಯ ಕುಲಪತಿಗಳ ಅನುಮೋದನ ದಿನಾಂಕ:

ಮಾನ್ಯ ಕುಲಪತಿಗಳ ಅನುಮೋದನ ಮೇರೆಗೆ, 2025-26ನೇ ಸಾಲಿನ ಪ್ರಾಣಿಶಾಸ್ತ್ರ (Zoology) ಸ್ನಾತಕ (UG) ವಿಭಾಗದ ಈ ಕೆಳಕಂಡ ಅಧ್ಯಕ್ಷರು ಹಾಗೂ ಸದಸ್ಯರುಗಳನ್ನು ಖೋಲಂಡ ಅಧ್ಯಯನ ಮಂಡಳ (BOS) ನೇಮಾತಿಸಿದ್ದು ಈ ಕೆಳಕಂಡ ನೇಮಿಸಲಾಗಿದೆ.

ಕ್ರ.ಸಂ	ಸರ್ತ ಮತ್ತು ವಿಳಾಸ	ಪದನಾಮ
1	ಡಾ. ನಾಗಭೂತ್ಯಾಂಕುರು ಪ್ರಾಣಿಶಾಸ್ತ್ರಕ್ರಮ, ಪ್ರಾಣಿಶಾಸ್ತ್ರ ವಿಭಾಗ ವಿಜಯನಗರ ಶ್ರೀ ಕೃಷ್ಣರೇವರಾಯ ವಿಶ್ವವಿದ್ಯಾಲಯ, ಬಳ್ಳಾರಿ ಮೆಲ್.ನಂ: 9880121090	ಅಧ್ಯಕ್ಷರು
2	ಡಾ. ಮಲಕ್ಕ ಜ ಪ್ರಾಣಿಶಾಸ್ತ್ರ ವಿಭಾಗ ಲ್ಯಾಂಡ್ ವೆಂಕಟೇಶ ದೇಸಾಯಿ ಮಹಾವಿದ್ಯಾಲಯ, ರಾಯಚೂರು ಮೆಲ್.ನಂ:9480771151	ಸದಸ್ಯರು
3	ಶ್ರೀ. ಎಂ. ಡಿ ದಾರಿಸ ಪ್ರಾಣಿಶಾಸ್ತ್ರ ವಿಭಾಗ ಎಸ್.ಎಂ. ಮತ್ತು ಜೆ.ಎಂ. ಪದವಿ ಮಹಾವಿದ್ಯಾಲಯ, ಸುರಪುರ ಮೆಲ್.ನಂ:9886213818	ಸದಸ್ಯರು
4	ಡಾ. ಎಂ.ನಾಥ ದ್ವೀ ಪ್ರಾಣಿಶಾಸ್ತ್ರ ವಿಭಾಗ ಸರ್ಕಾರಿ ಪ್ರಥಮ ದಜ್ರೆ ಕಾಲೇಜು, ರಾಯಚೂರು ಮೆಲ್.ನಂ:9448405795	ಸದಸ್ಯರು
5	ಡಾ. ವಿಜಯಲ್ಯಾಂಕುರು ಪ್ರಾಣಿಶಾಸ್ತ್ರ ವಿಭಾಗ ಲ್ಯಾಂಡ್ ವೆಂಕಟೇಶ ದೇಸಾಯಿ ಮಹಾವಿದ್ಯಾಲಯ, ರಾಯಚೂರು ಮೆಲ್.ನಂ:9980094573	ಸದಸ್ಯರು

ಕೆನಾರಟ ರಾಜ್ಯ ಉನ್ನತ ಶಿಕ್ಷಣ ಪರಿಷತ್ ರದ್ದಿಸಿದ ಮಾರ್ಗಸೂಚಿ ನಡಾವಳಿಗಳ ಅನ್ನ ಆದಿಕವಿ ಶ್ರೀ ಮಹಾರ್ಷಿವಾಲ್ಮೀಕಿ ವಿಶ್ವವಿದ್ಯಾನಿಲಯಕ್ಕೆ 2025-26ನೇ ಸಾಲಿಗೆ ಸ್ನಾತಕ (UG) ಪದವಿಗಳಿಗೆ SEP ಹೊಸ ಪತ್ರಕ್ಕುವನ್ನು 3 ರಿಂದ 6ನೇ ಸಮಿಸ್ತುರೂಪರೆಗೆ ತಯಾರಿಸಲು ಅಧ್ಯಯನ ಮಂಡಳ ಯ ಸಭೆಯನ್ನು ದಿನಾಂಕ: 12.05.2025ರ ಬೆಳಿಗೆ 11. ಗಂಗಾ ಅಧಿಕವಿ ಶ್ರೀ ಮಹಾರ್ಷಿವಾಲ್ಮೀಕಿ ವಿಶ್ವವಿದ್ಯಾನಿಲಯದ ಆಡಳಿತ ಕಚೇರಿಯಲ್ಲಿ ಅಯೋಜಿಸಲಾಗಿದ್ದು. ಈ ಅಧ್ಯಯನ ಮಂಡಳ ಸಭೆಗೆ ಭಾಗವಟಿಸಿ ತಮ್ಮ ವಿಷಯದ ಪತ್ರಕ್ಕುವನ್ನು ತಯಾರಿಸಲು ಈ ಮೂಲಕ ತಿಳಿಸಲಾಗಿದೆ.

ಡಾ.ಶಂ. ಶಿ  
ಕೆ.ಎ.ಎಸ್ (ಅಂತ್ಯ ಶ್ರೀರೆ)  
ಕುಲಸಚಿವರು

ಆದಿಕವಿ ಶ್ರೀ ಮಹಾರ್ಷಿವಾಲ್ಮೀಕಿ ವಿಶ್ವವಿದ್ಯಾನಿಲಯ, ರಾಯಚೂರು.

**ಇವರಿಗೆ,**

ಅಧ್ಯಯನ ಮಂಡಳ ಅಧ್ಯಕ್ಷರು, ಸದಸ್ಯರು ಹಾಗೂ ಸಂಬಂಧಪಟ್ಟ ಮಹಾವಿದ್ಯಾಲಯಗಳ ಪ್ರಾಂತೀಯಾಲಯಗಳ ಮಾರ್ಚಿಗಾಗಿ.

**ಪ್ರತಿಗಳು:**

1. ಕುಲಸಚಿವರು (ಪೋಲಿನ್ಯಾಪನ). ಆದಿಕವಿ ಶ್ರೀ ಮಹಾರ್ಷಿವಾಲ್ಮೀಕಿ ವಿಶ್ವವಿದ್ಯಾನಿಲಯ, ರಾಯಚೂರು.
2. ಹಣಕಾಸು ಅಧಿಕಾರಿಗಳು, ಆದಿಕವಿ ಶ್ರೀ ಮಹಾರ್ಷಿವಾಲ್ಮೀಕಿ ವಿಶ್ವವಿದ್ಯಾನಿಲಯ, ರಾಯಚೂರು.
3. ಕುಲಪತಿಗಳ ಅಷ್ಟ ಕಾಲ್ಯಾಂಚರ್ಚರ್/ಕುಲಸಚಿವರು ಅಷ್ಟ ಸಹಾಯಕರು, ಆದಿಕವಿ ಶ್ರೀ ಮಹಾರ್ಷಿವಾಲ್ಮೀಕಿ ವಿಶ್ವವಿದ್ಯಾನಿಲಯ, ರಾಯಚೂರು.
4. ಕಚೇರಿ ಪ್ರತಿ.

**Internal Assessment for Practical**

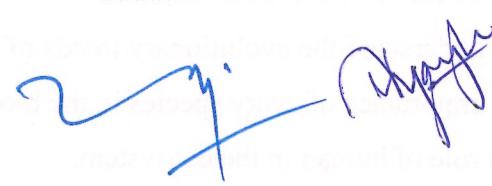
<b>Assessment type</b>	<b>Marks</b>
Test/Presentation/Project/Seminars	5
Laboratory Performance/Participation	5
<b>Total</b>	<b>10</b>

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

<b>Q.No.</b>	<b>Duration: 04 Hours</b>	<b>Max Marks: 40</b>
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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## Zoology

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

## Theory Syllabus

Course Title: <b>Cell Biology, Genetics, Evolution and Ethology</b>	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:

1. Understand the structure and functions of a basic unit of life.
2. Gain knowledge about the techniques and experiments in understanding molecular mechanisms.
3. Solve the genetic problems and establish phylogeny.
4. Establish the evolutionary relationship among different organisms.
5. Appreciate and scientifically assess the habit and habitat of different species.
6. Develop the skills to identify various animal behavior patterns.
7. Distinguish uniqueness of a particular animal and appreciate its biological importance in the perspective of conservation point of view.
8. Will be able to understand the evolutionary trends of organisms.
9. Appreciate the importance of every species in the biosphere.
10. Understand the role of human in the ecosystem.



Reeves

~~2 May 2005~~

Units	Description	Hours
1	Cellular organization, Structure and function of Cell organelles, Cell theory. Transport across cell membranes, cell junctions. Central dogma of molecular cell biology. Evidences for DNA as a genetic material Structure of dsDNA. Replication models, Transcription and post-transcriptional modification. Translation and post-translational editing of polypeptide. DNA sequencing.	16
2	Elements of heredity, Mendelian principles, Monohybrid and dihybrid cross experiments, Extensions to Mendelian principles; Interaction of genes; complementary genes, supplementary genes and epistasis. Sex linkage; Inheritance of X-linked characters, Sex-limited characters, sex-influenced characters. Multiple allelism, Inheritance of blood groups and Rh incompatibility.	16
3	Biopoiesis and theories of origin of life. Organic Evolution: Lamarckism and neo-Lamarckism, Darwinism, Darwin-Wallce theory of natural selection, modern synthetic theory of evolution. Adaptive radiations: Patterns of evolution (Divergence, Convergence, Parallel, Co-evolution). Fossilization and dating of fossils. Origin and evolution of human. Geological Time Scale.  Evidences of evolution: Relationship among organisms, Morphological, Anatomical, Embryological, Paleontological, Bio-geographical, Biochemical, Cytological evidences and current evidences  Forces of evolution: mutation, selection, genetic drift.  Species Concept: Biological species concept (Advantages and Limitations); Modes of speciation (Allopatric, Sympatric), Mass extinction.  Population Genetics: Microevolution and Macroevolution: allele frequencies, genotype frequencies, Hardy-Weinberg equilibrium and conditions for its maintenance.	16
4	Definition and types of animal behaviour, innate behaviour, taxes, reflexes, instincts and motivation. Learned behaviour- habituation, imprinting and conditioned reflexes.  Social organization in termites and honey bees.	16

	<p>Migration in fishes and birds.</p> <p>Courtship behavior in amphibians and birds; Nesting behavior in weaver and bayabird.</p> <p>Coloration and mimicry: Aggressive, protective and warning; Batesian and Mullerian mimicry.</p> <p>Ecological aspects of behavior: Habitat selection, food selection, optimal foraging theory, anti-predator defenses. Territoriality, Communication, conflict behavior, courtship behavior and maternal instinct.</p>	
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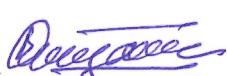
#### **Suggested references.**

1. Alberts, Bray Dennis, Lewis et al., (1994): Molecular Biology of the cell, Garland Publishing Inc. New York.
2. Young: The Life of Vertebrates (3rded 2006, ELBS/Oxford).
3. Parker T. S. and Haswell W. A. (1978). TextBook of Zoology, Vol. II, ELBS.
4. R.L Kotpal, Rastogi Publication.

*M. M. Deogance* *W. A. Haswell* *R. L. Kotpal*

5. Nagabhushan C M (2019). Advanced Practical Zoology, Edurite publications, Delhi.
6. Brown TA (1998): Genetics a molecular approach, 3<sup>rd</sup> ed, Chapman and Hall Publishers, London.
7. Gardner E J et al., (1991): Principles of Genetics, 8<sup>th</sup> ed. John Wiley and Sons Inc.
8. Gerald Karp (2013): Cell and molecular biology, Concepts and experiments, 7<sup>th</sup> Ed.
9. V K Agarwal (2010): Animal Behaviour, S. Chand Publications.
10. Veer Bala Rastogi (2020): Organic evolution (evolutionary biology), 15<sup>th</sup> Ed., MT Science Press.

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


## Semester End Theory Question Paper Pattern for UG Semester-IV (Major)

Paper Code:	Paper Title: <b>Cell Biology, Genetics, Evolution and Ethology</b>
Duration of Exam: 3 Hours	Max Marks: 80

<b>Section-A/ ವಿಭಾಗ-ಎ.</b>	
A. Answer any TEN of the following questions. Each question carried two marks. ಈ ಕೆಳಗಿನ ಯಾವುದಾದರೂ ಹತ್ತು ಪ್ರಶ್ನೆಗಳಿಗೆ ಉತ್ತರಿಸಿ. ಪ್ರತಿ ಪ್ರಶ್ನೆಗೆ ಎರಡು ಅಂಕಗಳು	$10 \times 2 = 20$ Marks
1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12.	
<b>Section-B / ವಿಭಾಗ-ಬಿ.</b>	
B. Answer any SIX of the following. Each question carries five marks. ಈ ಕೆಳಗಿನ ಯಾವುದಾದರೂ ಪ್ರಶ್ನೆಗಳಿಗೆ ಉತ್ತರಿಸಿ. ಪ್ರತಿ ಪ್ರಶ್ನೆಗೆ ಎರಡು ಅಂಕಗಳು	$6 \times 5 = 30$
1. 2. 3. 4. 5. 6. 7. 8.	
<b>Section-C / ವಿಭಾಗ-ಸಿ.</b>	
C. Answer any THREE of the following. Each question carries ten marks. ಈ ಕೆಳಗಿನ ಯಾವುದಾದರೂ ಮೂರು ಪ್ರಶ್ನೆಗಳಿಗೆ ಉತ್ತರಿಸಿ. ಪ್ರತಿ ಪ್ರಶ್ನೆಗೆ ಹತ್ತು ಅಂಕಗಳು	$3 \times 10 = 30$
1. 2. 3. 4. 5.	

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

Course Title: <b>Cell Biology, Genetics, Evolution and Ethology.</b>	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 Hrs
Semester End Exam Marks: 40	

**Course Outcomes (COs):**

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

1. Understand and appreciate the composition of cell.
2. Learn the structure and function of cell organelles.
3. Develop the skills to draw the chromosomes and cell structure.
4. Gain the skills micro-preparation techniques.
5. Enhance basic laboratory skills, observation and drawing.
6. Demonstrate the genetic solutions for the problems.
7. Explain the osteological characters.
8. Understand evolutionary relationship among vertebrates.
9. Take up research in biological sciences.
10. Observe the ethological behavior among species.

List of Experiments
<ol style="list-style-type: none"> <li>1. Micro-preparation of onion-root tips for mitosis and testes of grass hopper/flower buds for meiosis.</li> <li>2. Study of permanent slides of mitosis and meiosis stages.</li> <li>3. Study of giant chromosomes using <i>Chironomus</i> larva/permanent slides.</li> <li>4. Genetics problems (monohybrid, dihybrid, blood groups, X-linkage, epistasis)</li> <li>5. Genetic pedigree analysis chart preparation.</li> <li>6. Study of genetic characteristics using animal samples.</li> <li>7. Determination of human blood groups.</li> <li>8. Study of Darwin's finches.</li> <li>9. Study of HMS Beagle track history.</li> <li>10. Types of fossils.</li> <li>11. Study of homologous and analogous organs.</li> <li>12. Mimicry.</li> <li>13. Classical conditioning experiment.</li> <li>14. Trial and error theory of learning.</li> <li>15. Colonies and castes of Honey bee and Termites.</li> <li>16. Social organization in honey bees.</li> </ol>

**\*Note:** i) Students should draw the diagrams rather than just pasting the pictures in the records.  
ii) Practicals are subject to the availability of resources and may be modified accordingly on consent with BoS members. At least 12 practical experiments covering the course title is advisable.

## Internal Assessment for Practical

Internal Assessment for Practical	
Assessment type	Marks
Test/Presentation/Project/ Seminars	5
Laboratory Performance/Participation	5
<b>Total</b>	<b>10</b>

## Semester End Practical Question Paper Pattern for UG Semester-IV (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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**Zoology**  
**B.Sc., Semester – IV (SEP)**  
**DISSERTATION (PROJECT)**

Course Title: <b>Dissertation (Project work)</b>	Course Code:
Total Contact Hours: 2	No. of Credits: P = 2
Contact hours per week: 2	L:P (1:2)
Internal Assessment Marks: 10	Duration of SEE: 04 Hrs.
Semester End Exam Marks: 40	

**Course Outcomes (CO's):**

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

1. Understand the research and develop scientific temper.
2. Learn to state research problems / hypothesis.
3. Develop the detailed in-sights into observation, analysis, interpretation of data.
4. Inculcate the knowledge of problem solving using scientific temperament.
5. Develop scientific attitude.
6. Carryout independent research at local, national and international standard.

**Aim:** (a) Application of knowledge to real life situation (b) to introduce research methodology.

The topic of dissertation may be laboratory-oriented / field-oriented or combined or computational project work across the branches of zoology is to be undertaken by every student to gain research insights in the relevant areas of interest with an emphasis on originality of approach. The course involves framing a problem statement (define hypothesis / alternate hypothesis), design a research program and investigate to find out the possible solution for it. It may be started early and shall be completed by the end of the 4<sup>th</sup> semester. The Dissertation to be submitted should include (a) background information in the form of introduction (b) objectives of the study (c) materials and methods employed for the study (d) results and discussion thereon (e) summary and conclusions and (f) bibliography. Apart from these sections, importance of the results, originality and general presentation also may be taken into consideration for evaluation. At the end of the course, each student should submit the findings of his/her research in a printed and bound form of book.



Internal Assessment for Dissertation	
Assessment type	Marks
Test/Presentation/Project/ Seminars	5
Laboratory Performance/Participation	5
Total	10

<b>Semester End Examination for UG Semester-IV (Major)</b>		
<i>Q. No.</i>	<i>Duration: 04 Hours</i>	<i>Max. Marks: 40</i>
1	Submission of dissertation and oral (includes MS Office Power Point) presentation.	30
2	Viva-Voce	10
	<b>Total</b>	<b>40</b>

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W. M. ...

Christopher

27.1.2018