ADUSUMILLI GOPALAKRISHNAIAH & SUGAR CANE GROWERS SIDDHARTHA DEGREE COLLEGE OF ARTS & SCIENCE, VUYYURU

An Autonomous College in the Jurisdiction of Krishna University, Machilipatnam

NAAC reaccredited at 'A 'level

ISO 9001-2015

BOARD OF STUDIES MEETING FOR B.SC. BZC2022-2023 II& IV&VI SEMESTERS

25th March 2023

DEPARTMENT OF ZOOLOGY

AG& SG Siddhartha Degree College of Arts & Science
Vuyyuru

2022-2023

Minutes of the meeting of Board of studies in Zoology for the Autonomous courses of AG & SG Siddhartha Degree College of Arts & Science, Vuyyuru, held at 10:00 am on 25-03-2023 in the Department of Zoology.

Smt.D.A. Kiranmayee. ... Presiding

Members Present:

1) .....D.A.Kiranmayee..... **(Smt. D.A.Kiranmayee.)**	Chair person	Head, Department of Zoology, A.G&S.G.S Degree College of Vuyyuru-521165.
2)..... 25/3/23 **(Smt. Dr.L.Suseela.)**	University Nominee	Bio Sciences & Bio technology Krishna University Machilipatnam.
3)...M.Vijay kumar..... **(Sri Dr.M.Vijay kumar.)**	Academic Council Nominee	Head, Department of Zoology, SRR & CVR Govt. Degree College, Vijayawada.
4).....Ch.Venkateswarlu..... **(Sri Ch. Venkateswaralu.)**	Academic Council Nomine	Head, Department of Zoology, P.B. Siddhartha College, Vijayawada.
5)..... **(B. Appala Naidu.)**	Industrialist	Principle Scientific Officer, RGCA Manikonda.
6)...K.padmaja..... **(Smt. K. Padmaja.)**	Member	Lecturer in Zoology, A.G&S.G.S Degree College Vuyyuru-521165.
7).....V.Subhashini..... **(Smt. Dr.V.Subhashini.)**	Member	Lecturer in Zoology, A.G&S.G.S Degree College Vuyyuru-521165.
8).....Ch.Chiranjeevi..... **(Ch.Chiranjeevi.)**	Student Represent	P.hd –Research Scholar, Dept.of Botany & Microbiology, Acharya Nagarjuna University, Guntur.

ZOOLOGY

Agenda for B.O.S Meeting.

1. To recommend the syllabi (Theory & Practical), Model question paper for II Semester of IB.Sc (B.Z.C) for the academic year 2022 - 2023.

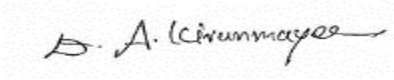
2. To recommend the syllabi (Theory & Practical), Model question paper for IV Semester of II B.Sc (B.Z.C) for the academic year 2022 - 2023.

3. To recommend the Blue print for the semester end exam for II&IV semester of I &IIB.Sc (B.Z.C) for the academic year 2022 - 2023.

4. Tointroduce SkillDevelopment Course –Poultry Farming for I year students in thisacademic year 2022-23.

5. To recommend the teaching and evolution methods to be followed under Autonomousstatus.

6. Any other matter.



Chairman.

ZOOLOGY- RESOLUTIONS

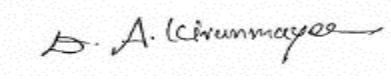
1. It is resolved to continue the same syllabi (Theory & Practical), model question paper &guide lines to be followed by the question paper setters of Zoology of II semester of I B.Sc. (B.Z.C) under Choice Based Credit System (CBCS) to be approved by the Academic Council of 2022 – 2023.
2. It is resolved to implement new paper for IV SEM of II B.Sc. BZC as approved by BOS members. The paper title is Embryology, Animal Physiology and Animal Ecology. It is resolved to continue the same syllabus for the IV SEM of II B.Sc. BZC in 402 paper.
3. It is resolved to Continue thesame Blue prints of II&IV Semestersof B.Sc Zoology for the Academicyear 2022-2023.
4. It is resolved to implement SkillDevelopment Course for I year students in Poultry farming.
5. It is resolved to continue the following teaching & evaluation methods for the Academic year 2022-23.
6. In VI Sem there is 3 months Internship for III BZC students

Teaching methods:

Besides the conventional methods of teaching, we use modern technology i.e. Using of OHP and LCD projector to display on U boards etc; for better understanding of concepts.

Evaluation of a student is done by the following procedure:

- **Internal Assessment Examination:**
- Out of maximum 100 marks in each paper for IB.Sc, 30 marks shall be allocated for internal assessment.
- Out of these 30 marks, 20 marks are allocated for announced tests (i.e . IA-1& IA-2). Two announced tests will be conducted and average of these two tests shall be deemed as the marks obtained by the student, 5 marks are allocated on the basis of candidate's percentage of attendance and remaining 5 marks are allocated for the assignment for I B.SC.
- Out of maximum 100 marks in each paper for II B.Sc, 25 marks shall be allocated for internal assessment.
- Out of these 25 marks, 15 marks are allocated for announced tests (i.e .IA-1& IA-2). Two announced tests will be conducted and average of these two tests shall be deemed as the marks obtained by the student, 5 marks allocated on assignment andreaming 5 marks seminar for IV semester.
- **Semester – End Examination:**
- The maximum mark for I (BZC) semester – End examination shall be 70 marks and duration of the examination shall be 3 hours.
- The maximum mark for IIB.Sc semester- End examination shall be 75 marks and duration of the examination shall be 3 hours. Even through the candidate is absent for two IA exams / obtain zero marks the external marks are considered (if the candidate gets 40/70) and the result shall be declared as "PASS"
- Semester – End examination shall be conducted in theory papers at the end of every semester, while in practical papers, these examinations are conducted at the end of I & IV semester for I &II B.Sc.
- Discussed and recommended for organizing Seminars, Guest lectures, Work – Shops to upgrade the Knowledge of students, for the approval of the Academic Council.



Chairman

ADUSUMILLI GOPALAKRISHNAIAH & SUGAR CANE GROWERS SIDDHARTHA DEGREE COLLEGE OF ARTS & SCIENCE, VUYYURU-521165, KRISHNA Dt., A.P. (AUTONOMOUS).

❖ ALLOCATION OF CREDITS

❖ For the Papers offered during II&IV Semesters

Year	Semester	Title	Teaching hours	Internal marks	External marks	Credits
I	II	Animal Diversity Biology of Chordates	4	30	70	03
		Practical – II	2	10	40	02
	II	Poultry farming	2	15	35	02
II	IV	Embryology, Physiology, & Ecology	4	25	75	03
		Practical – IV	2	10	40	02
		Immunology & Animal Biotechnology	4	25	75	03
		Practical – V	2	10	40	02
III	VI	VIII	SEMESTER INTERNSHIP			

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NAAC reaccredited at 'A 'level

Autonomous –ISO 9001-2015 Certified

Title of the Paper: **Animal Diversity Biology of Chordates**

Semester: - II

Course Code	ZOOT21A	Course Delivery Method	Class Room/Blended Mode - Both
Credits	3	CIA Marks	30
No. of Lecture Hours/ Week	4	Semester End Exam Marks	70
Total Number of Lecture Hours	60	Total Marks	100
Year of Introduction : 2021-22	Year of Offering 2021-2022	Year of Revision – 2021-22	Percentage of Revision: 0%

Course Objectives:

- To understand the structural organization of animals of prochordates and cyclostomes.
- To understand the type study belonging to Pisces.
- To understand type study belonging to amphibian.
- To understand the type study belonging to reptilia and identification of piousness snakes.
- To understand the type study belonging to Aves and Aquatic mammals.

Course Outcomes:

CO1	Gain knowledge in the major Chordate groups, describe their salient features,appreciate the diversity and analyze the uniqueness of different groups.
CO 2	Understand the fundamental organization of chordates and evaluate the similarities and differences among the different groups of chordates in the light o evolutionary significance.
CO 3	Comprehend and compare the morphology and anatomy of different classes ofchordates and apply the same to their fitness in the ecological habitats
CO 4	Develop the skill of identifying the vertebrate fauna in general and South Indianfauna in specific.
CO 5	Acquaint with the significance of unique mechanisms and behavioral patternsexhibited by different groups of chordates.

Syllabus

Unit	Learning Units	Lecture Hours
I	UNIT I 1.0. Protochordates to cyclostomes 1.1. Protochordates 1.1.1 Salient features of UrochordataandCephalochordata 1.1.2. Structure and life-history of *Herdmania*, 1.1.3. Significance of retrogressive metamorphosis. 1.2. General organization of vertebrates 1.3. General characters of cyclostomes 1.4. Comparison of *Petromyzon*and*Myxine*1 hour	8 hrs
II	UNIT II 2.0 Fishes 2.1. Type study – *Scoliodon* - Morphology, respiratory, circulatory, excretory and nervous systems and sense organs. 2.2. Migration in fishes. 2.3. Viviparity in fishes 2.4. Types of scales 2.5. Accessory respiratory organs in fishes	13 HOURS
III	UNIT III 3.0. Amphibia 3.1. South Indian Amphibians. 3.2. Type study - *Rana*: Morphology, digestive system, respiratory system circulatory system,excretory system, nervous system and reproductive system 3.3. Parental care in amphibians	11 HOURS
IV	UNIT IV 4.0. Reptilia 4.1. South Indian Chelonians. 4.2. Type study – *Calotes*: Morphology, digestive, respiratory, circulatory, urinogenital and nervous systems. 4.3. Identification of poisonous snakes	11 HOURS
V	UNIT V 5.0. Aves and Mammalia 5.1. Aves 5.1.1 Birds as Glorified Reptiles. 5.1.2. Type study-Pigeon (*Columbialivia*): Exoskeleton, respiratory, circulatory and excretory systems 5.1.3. Significance of migration in birds 5.1.4. Flight adaptations in birds 5.2. Mammalia 5.2.1. Aquatic Mammals 5.2.2. Dentition in Mammals.	17 HOURS

Textbooks
1. R.L. Kotpal, *Modern Text Book of Zoology - Invertebrates*.
2. P.S. Dhami and J.K. Dhami*Invertebrate Zoology*.

Recommended Reference book:
Suggested Readings
1. E.L.Jordan and P.S. Verma'*Chordate Zoology'* -. S. Chand Publications.
2. Mohan P.Arora. '*Chordata – I*, Himalaya Publishing House Pvt.Ltd.
3. Marshal, Parker and Haswell'*Text book of Vertebrates*'. ELBS and McMillan, England.
4. Alfred Sherwood Romer. Thomas S. Pearson '*The Vertebrate Body*, Sixth edition, CBS college Publishing, Saunders College Publishing
5. George C. Kent, Robert K. Carr. *Comparative Anatomyof the Vertebrates*, 9th ed. McGraw Hill.
6. Kenneth Kardong*Vertebrates: Comparative Anatomy, Function and Evolution*, 4thed, 'McGraw Hill.
7. J.W. Young, *The Life of Vertebrates*, 3rded, OxfordUniversity press.
8. Harvey Pough F, Christine M. Janis, B. Heiser, *Vertebrate Life*, Pearson, 6thed, Pearson Education Inc.2002.

Course Delivery method: Face-to-face / Blended.
Course has focused on: Foundation

Websites of Interest:

https://www.youtube.com/watch?v=-mcfPHd_sH8https://www.youtube.com/watch?v=U8F9IzuwdzQhttps://www.youtube.com/watch?v=jhXqIy49YEw
https://www.youtube.com/watch?v=ywD50XyayFk

Co-curricular Activities:
- Preparation of charts on Chordate classification (with representative animal photos) and retrogressive metamorphosis
- Thermocol or Clay models of Herdmania and Amphioxus
- Visit to local fish market and identification of local cartilaginous and bony fishes
- Maintaining of aquarium by students
- Thermocol model of fish heart and brain
- Preparation of slides of scales of fishes
- Visit to local/nearby river to identify migratory fishes and prepare study notes
- Preparation of Charts on topics by students (Eg: comparative account of vertebrate heart/brain/lungs, identification of snakes etc.)
- Collecting and preparation of Museum specimens with dead frogs/snakes/lizards etc., and/or their skeletons
- Additional input on types of snake poisons and their antidotes (student activity).
- Collection of bird feathers and submission of report on Plumology
- Taxidermic preparation of dead birds for Zoology Museum
- Map pointing of prototherian and metatherian mammals
- Chart preparation for dentition in mammals

D.A. Kiranmayee
Signature of the Course In-charge

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Signature of the Program In-charge

Signature of the HOD

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II SEMESTER END EXAMINATIONS

PAPER – IIMODEL PAPERCours Code: ZOOT21A

Title of the paper: Animal Diversity Biology of Chordates

(W.E.F 2022-2023)

Time: 3 Hours **Max. Marks: 70**

Draw neat labelled diagrams wherever necessary.

SECTION –A (20M)

Answer all Questions

(Restrict to maximum of 2 sub divisions)

1. i. Describe the structure of *Herdmania*– CO1 L2 4M

(Or)

ii. Enumerate the general characters of Cephalochordata – CO1 L1 4M

2. i. Explain the different types of Scales in fishes –CO2 L2 4M

(Or)

ii. Explain Viviparity in fishes – CO2, L2 4M

3. i. Describe the southindian amphibians– CO3, L2 4M

(Or)

ii. Describe the ventricles of brain of frog – CO3, L24M

4. i. Distinguish between poisonous and non-poisonous snakes – CO4, L2 4M

(Or)

ii. Describe the functions of brain of calotes- CO4, L2 4M

5. i. explains the structure of tooth. CO5, L2 4M

(Or)

ii. Describe the structure of quill feather. CO5, L2 4M

SECTION – B(50M)

Answer all Questions

(Restrict to maximum of 2 sub divisions)

6.i. What is meant by Retrogressive Metamorphosis? Apply the phenomenon with reference tothe development of *Herdmania* – CO1, L3 10M

(Or)

ii. Enumerate the General characters of Cyclostomes – CO1 L3 10M

7. i. Describe the Respiratory system in *Scoliodon*– CO2, L2 10M

(Or)

ii. Explain the significance of Accessory respiratory organs –CO2, L2 10M

8. i. Describe Respiratory system in *Rana*– CO3, L2 10M

(Or)

ii. Discuss Parental Care in Amphibians – CO3 L2 10M

9. i. Explain about the South Indian Chelonians – CO4, L2 10M

(Or)

ii. Describe the structure and working of heart of *Calotes*- CO4, L2 10M

10. i. Describe the Respiratory system in Pegion – CO5, L2 10M

(Or)

ii. Explain about the Aquatic Mammals – CO5, L2 10M

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PRACTICAL- II (At the end of II Semester)

Title of the paper: Animal Diversity -Biology of Chordates

No of Hours: 30 **Credits: 02**
WEF: 2022-2023Course Code: ZOOP21A

LEARNING OUTCOMES:
By the end of the course students will be able to
1. to Understand the general characters and classification from Pisces to Mammalia
2. to Understand the importance of preservation of museum specimens
3. to Identify chordates based on special identifying characters
4. to Understand different organ systems through demo or virtual dissections
5. to Maintain a neat, labeled record of identified museum specimens
6. to Exhibit the hidden creative talent

COURSE OUTCOMES:

CO1	To identify the systematic position of Protochordata, Cyclostomata and Pisces. PO1, PO2, PO5, PO6, PO7, PSO1
CO2	To identify the systematic position of Amphibians and Reptiles. PO1, PO2, PO5, PO6, PO7, PSO1
CO3	To identify the systematic position of Aves and mammals. PO1, PO2, PO5, PO6, PO7. PO1, PO2, PO5, PO6, PO7, PSO1
CO4	To Study the Appendicular skeleton of Varanus, Gallus and Oryctolagus. PO1, PO2, PO5, PO6, PO7, PSO1
CO5	To understand the various systems of Fish by Dissecting and process of Mounting the scales of Fish. PO1, PO2, PO5, PO6, PO7, PSO1

SYLLABUS

General characters and classification of the following phyla and sub-phyla up to classes with suitable examples: Pisces (up to subclass only), Amphibia (up to orders), Reptilia (up to orders), Aves (up to subclass only) and Mammalia (up to infraclass only).

I. SPECIMENS.

1. Protochordata: Herdmania, Amphioxus.
Slides: Amphioxus T.S through pharynx.
2. Cyclostomata: Petromyzon, Myxine.
3. Pisces: Pristis, Torpedo, Channa, Pleuronectes, Labeo, Catla, Hippocampus, Exocoetus, Echeneis, Clarias, Anguilla.
Slides: Fish scales.
4. Amphibia: Ichthyophis, Amblystoma, Siren, Axolotl larva, Hyla, Rhacophorus.
5. Reptilia: Trionyx, Testudo, Draco, Chamaeleon, Uromastix, Daboia (=Vipera) russelli, Naja, Enhydrina, Bungarus, Crocodilus.
6. Aves: Psittacula, Bubo, Alcedo, Passer, Eudynamis, Corvus
Different types of feathers- quill, contour, filoplume and down.
7. Mammalia: Ornithorhynchus, Didelphys, Pteropus, Funambulus, Manis, Erinaceus.

II. OSTEOLOGY.

Appendicular skeleton of Varanus, Gallus and Oryctolagus - limbs and girdles.

III. DEMONSTRATION OF DISSECTIONS
1. Mounting of fish scales.
2. Channa: Digestive system
3. Scoliodon: V, VII, IX and X cranial nerves.

Suggested Manuals:

Suggested manuals
1. Practical Zoology – Vertebrata - S.S.Lal
2. A manual of Practical Zoology – ChordataP.S.Verma

Course Delivery method: Face-to-face / Blended.
Course has focused on: Skill Development

Weblinks:

https://www.youtube.com/watch?v=-2Q2rqEh0Bk
https://www.youtube.com/watch?v=C35LwntxUkE
https://www.youtube.com/watch?v=OuEUQRQ3iQo

Co-curricular Activities:

Preparation of slides of scales of fishes

- Visit to local/nearby river to identify migratory fishes and prepare study notes
- Preparation of Charts on topics by students (Eg: comparative account of vertebrate heart/brain/lungs, identification of snakes etc.)
- Collecting and preparation of Museum specimens with dead frogs/snakes/lizards etc., and/or their skeletons
- Additional input on types of snake poisons and their antidotes (student activity).
- Collection of bird feathers and submission of report on Plumology
- Taxidermic preparation of dead birds for Zoology Museum
- Map pointing of prototherian and metatherian mammals
- Chart preparation for dentition in mammals

D.A Kiranmayee

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I B.Sc. ZOOLOGY PRACTICAL EXAMINATION

Practical - IICourse Code: ZOOP21A
Title of the paper: Animal Diversity Biology of Chordates

Time: 3hrs. **Max. Marks 40M**

1. List out the general characters of Class Mammalia. CO5, L 5 M

2. Identify and draw a neat labelled diagram of digestive system of *Channa*. CO2, L3 10 M
Identification: 2M
Diagram: 4 M
Labelling: 4 M

3. Identify, draw a labelled diagram, classify and write notes on A, B, C, D and E CO1,2,3,4,5 L2
5 X 3 = 15 M
A. Protochordata and Cyclostomata
B. Pisces
C. Amphibia and Reptilia
D. Aves and Mammalia
E. Osteology
Identification: 1 M
Diagram : $^1/_2$
Classification: $^1/_2$
Comment 1 M

4. Practical Record Book CO1, 2,3,4,5 L3 5 M

5. VIVA CO1, 2,3,4,5 L5 5 M

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Title of the Paper:**Embryology, Animal Physiology and Animal Ecology.**

Semester: - IV

Course Code	**ZOOT41A**	Course Delivery Method	Class Room/Blended Mode - Both
Credits	3	CIA Marks	25
No. of Lecture Hours/ Week	4	Semester End Exam Marks	75
Total Number of Lecture Hours	60	Total Marks	100
Year of Introduction : 2017-18	Year of Offering 2021-2022	Year of Revision – 2021-22	Percentage of Revision: 0%

OBJECTIVES

- The study of fundamentals of embryology
- The study of functional aspects of the body.
- Understanding the mechanism of homeostasis
- Understanding the mechanism of coordination in the body.
- Understanding the structural and functional aspects of an ecosystem.
- Understanding the dynamics of populations

COURSE OUTCOMES

CO 1	Comprehend and describe the process of formation and fusion of gametes and appraise the significance of foetal membranes and placenta in the formation of an embryo.
CO 2	Understand the mechanism of functioning of the different organ systems of a vertebrate and analyse their coordination in adapting the animal to the changing environment.
CO 3	Identify and describe the histology of various organs of a mammal and developmental stages of chick embryo at different hours of incubation.
CO 4	Develop skill in conducting tests for identification of the presence of biomolecules and excretory products and estimating various water parameters.
CO 5	Acquaint with the structural and functional aspects of an ecosystem, concept of community and population - their characteristics and interactions and analyse the adaptations of animals to specific habitat and explain peculiarities in their distribution in different zoogeographical realms.

SYLLABUS

I	UNIT- I Embryology Spermatogenesis, oogenesis and Fertilization. Types of eggs Types of cleavages Development of frog up to gastrulation and formation of primary germ layers Foetal membranes and their significance in chick embryo Placenta in mammals: types and functions	14hrs
II	UNIT- II Physiology – I Digestive system: process of digestion Absorption of digested food Respiratory system - Pulmonary ventilation, transport of oxygen and Carbon dioxide Circulatory system - Structure and functioning of heart, Cardiac cycle. Excretory system - Structure of nephron, urine formation, and counter current Mechanism	14hrs
III	UNIT - III Physiology - II Nerve impulse -Resting membrane potential, origin and propagation of action potentials along myelinated and non- myelinated nerve fibres Muscle contraction - Ultra structure of muscle fibre, molecular and chemical basis of muscle contraction Endocrine glands - Structure, secretions and the functions (of hormones) of pituitary, thyroid, parathyroid, adrenal glands and pancreas Hormonal control of reproduction in human being 1 Hour	12hrs
IV	UNIT - IV Ecology I Physical and chemical factors of an ecosystem Pressure Atmospheric gases: oxygen and carbon dioxide. Functional aspects of an ecosystem Biogeochemical cycles: nitrogen cycle, phosphorus cycle and carbon cycle Animal communities Types of communities Community structure Ecotone and edge effect, Community interactions Prey-predator relationships Competition	11hrs
V	UNIT - V Ecology - II Habitat Ecology and adaptations Ecological habitat and niche Desert adaptations,Pelagic adaptations Population Ecology Characteristics of animal populations <u>Zoogeography</u> Zoogeographical regions: Study of physical and faunal peculiarities of Oriental, Australian and Ethiopian regions.	9hrs

Textbooks

1. A.K. Berry, *A Text Book of Animal Physiology*, Delhi
2. SubrahmanyamN.S.&. Sambamurthy A.V.S.S, *Ecology,* Narosa Publishing House,New Delhi

Suggested Readings

1. Gerard J. Tortora and Sandra Reynolds Garbowski*Principles of Anatomy and Physiology*, Tenth Ed., John Wiley & Sons
2. Arthur C. Guyton MD, *A Text Book of Medical Physiology,* Eleventh ed., John E. Hall, Harcourt Asia Ltd.
3. William F. Ganong, *A Review of Medical Physiology*, 22 ed, McGraw Hill, 2005
4. Sherwood, Klandrof, Yanc, *Animal Physiology*, Thompson Brooks/Coole, 2005.
5. Sherwood, Klandrof, Yanc,*Human Physiology*, Thompson Brooks/Coole, 2005.
6. Knut Scmidt-Nielson, *Animal Physiology*, 5thed, Cambridge Low Price Edition.
7. Roger Eckert and Randal, *Animal Physiology*, 4thed, Freeman Co, New York.
8. BaliniskyB.I.*An introduction to Embryology*, 5thed, Thompson Brook, Coole.
9. McEwen, R.s. *Vertebrate Embryology*, Oxford and IBH Publishing Co. New Delhi.
10. M.P.Arora, '*Ecology*' Himalaya Publishing company.
11. P.D.Sharma, *Environmental Biology'*.
12. P.R.Trivedi and Gurdeep Raj. '*Environmental Ecology'*
13. BuddhadevSarma and Tej Kumar, *Indian Wildlife Threats and Preservation*
14. Chapman J.L. and Reiss M.J, *Ecology Principles and Applications,* Second Ed., Cambridge University Press, London.
15. Benny Joseph, *Environmental Studies*, TATA MGraw Hill Com., New Delhi.
16. Eugene P. Odum, *Fundamentals of Ecology* Third Ed., NataraJ Publishers, Dehradun.
17. BaliniskyB.I.*An introduction to Embryology*, 5thed, Thompson Brook, Coole.
18. McEwen, R.s. *Vertebrate Embryology*, Oxford and IBH Publishing Co. New Delhi.

Course Delivery method: Face-to-face / Blended.

Course has focused on: Foundation

Weblinks

https://www.youtube.com/watch?v=4Q43dqaIvnc
https://www.youtube.com/watch?v=7LqQYmgMqLk
https://www.youtube.com/watch?v=qtTLiQoYTyQ

CO-CURRICULAR ACTIVITIES

- Chart on cardiac cycle, human lung, kidney/nephron structure etc.
- Working model of human / any mammalian heart.
- Chart of sarcomere/location of endocrine glands in human body
- Chart affixing of photos of people suffering from hormonal disorders
- Student study projects such as identification of incidence of hormonal disorders in the local primary health center, studying the reasons thereof and measures to curb or any other as the lecturer feels good in nurturing health awareness among students
- Preparation of models of different types of eggs in animals
- Chart on frog embryonic development, fate map of frog blastula, cleavage etc.

D.A. Kiranmayee

Signature of the Course In-charge

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Signature of the Program In-charge

Signature of the HOD

A.G. & S.G.Siddhartha Degree College of Arts & Science, Vuyyuru – 521165, Krishna Dt. A.P. (Autonomous)

Semester IV **w.e.f. 2022-2023**
(Model question paper)
Title of the paper: Embryology, Animal Physiology and Animal Ecology.
Code – ZOOT41A
Time: 3hrs. **Max.Marks: 75**

SECTION –A

Answer and FIVE of the following 5x5=25 Marks
Draw neat labelled diagrams wherever necessary.

1. Mention the different types of eggs CO1, L1
2. Explain fate maps of frog blastula CO2, L2
3. Illustrate the structure of nephron CO3, L3
4. Analyze the process of absorption of lipids CO3, L4
5. Explain the significance of adrenal hormones CO3, L5
6. Explain Phosphorous cycle CO4, L2
7. Write a comparative account on ecotone and edge effect. CO5, L4
8. List out the different pelagic adaptations. CO5, L1

SECTION – B

Answer any FIVE of the following 5X10=50 Marks
Draw neat labelled diagrams wherever necessary.

9. Write an essay on foetal membranes and their significance in chick embryo. CO2, L2

OR

Describe the process of gametogenesis CO2, L2

10. Explain the process of transportation of Oxygen through blood.CO3, L2

OR

Describe the structure and functioning of mammalian heart. CO3, L2

11. Write an essay on hormonal control of reproduction in human beings. CO3, L4

OR

Explain the propagation of action potential along myelinated and non-myelinated nervefibres. CO3, L4

12. Explain pressure as an ecological factor. CO4, L2

OR

Explain prey-predator relationships in animal communities.CO5, L2

13. Write an essay on the various adaptations of desert animals. CO5, L1

OR

Describe the physical features and fauna of Ethiopian region.CO5, L1

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PRACTICAL - IV

.Title:-. Embryology, Animal Physiology and Animal Ecology

Code: ZOOP41A
Credits:- (02)
MAX.MARKS: 40
(2hrs/week)

OBJECTIVES

- Identify the different stages of development of a vertebrate embryo
- Analyze the presence of various substances of metabolism
- Estimate the amount of chemical parameters of a water body
- Maintain a neat, labelled record of work done in the laboratory

Syllabus:

I. Embryology

1. Study of T.S. of testis, ovary of a mammal

2. Study of different stages of cleavages (2, 4, 8 cell stages)

3. Construction of fate map of frog blastula

4. Study of chick embryos of 18 hours, 24 hours, 33 hours and 48 hours of incubation

II. Physiology

1. Qualitative tests for identification of carbohydrates, proteins and fats

2. Qualitative tests for identification of ammonia, urea and uric acid

3. Study of activity of salivary amylase under optimum conditions

4. Study of prepared slides of T.S. of duodenum, liver, lung, kidney, spinal cord, bone and cartilage of a mammal

III. Ecology

1. Determination of pH of given sample.

2. Estimation of dissolved oxygen of given sample.

3. Estimation of total alkalinity of given sample.

4. Estimation of salinity of given sample.

REFERENCE BOOKS:

1. Harper's Illustrated Biochemistry
2. Cell and molecular biology: Concepts & experiments. VI Ed. John Wiley &sons. Inc.
3. Lab Manual on Blood Analysis and Medical Diagnostics, S. Chand and Co. Ltd.
4. Laboratory techniques by Plummer

Course Delivery method: Face-to-face / Blended.
Course has focused on: Skill Development

Weblinks

https://www.youtube.com/watch?v=4Q43dqaIvnc
https://www.youtube.com/watch?v=7LqQYmgMqLk
https://www.youtube.com/watch?v=qtTLiQoYTyQ

CO-CURRICULAR ACTIVITIES

- Chart affixing of photos of people suffering from hormonal disorders
- Student study projects such as identification of incidence of hormonal disorders in the local primary health center, studying the reasons thereof and measures to curb or any other as the lecturer feels good in nurturing health awareness among students
- Preparation of models of different types of eggs in animals
- Chart on frog embryonic development, fate map of frog blastula, cleavage etc.

D.A.Kiranmayee

Signature of the Course In-charge

D.A.Kiranmayee

Signature of the Program In-charge

Signature of the HOD

A. G & S. G. S. DEGREE COLLEGE OF ARTS & SCIENCE, VUYYURU 521165, KRISHNA Dt., A.P. (AUTONOMOUS)

PAPER – IV

Title: Embryology, Animal Physiology and Animal Ecology

w.e.f.2022-23.

Time:3hrs Model Question paper (External) Max.Marks: 40 M.

Paper Code: ZOOP41A

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1. Identify any two organic substances (Proteins and Carbohydrates) present in the given tissue sample. Write the procedure and tabulate the results. 10 M

2. Estimate the total Alkalinity of the water sample. Write the procedure and tabulate the results. 10 M

i. Procedure 03

ii. Experiment 05

iii. Table 02

3. Identify, Classify, Draw diagrams and write notes on. 4 X 2 ½ = 10M

A. Histology slide

B. Histology slide

C. Embryology slide

D. Embryology slide

Identification: 1 M
Diagram: ½ M
Comments: 1 M

4. PRACTICAL RECORD BOOK 10M

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NAAC reaccredited at 'A 'level
Autonomous –ISO 9001-2015 Certified

Title of the Paper: Immunology and Animal Biotechnology

Semester: - IV

Course Code	**ZOOT01**	Course Delivery Method	Class Room/Blended Mode - Both
Credits	3	CIA Marks	25
No. of Lecture Hours/ Week	4	Semester End Exam Marks	75
Total Number of Lecture Hours	60	Total Marks	100
Year of Introduction : 2021-22	Year of Offering 2021-2022	Year of Revision – 2021-22	Percentage of Revision: 0%

OBJECTIVES

- To understand the different types of immunity in man and different cells and organs of immune system
- To understand the different types of antigens and antibodies
- To analyze the role of immunity in health and disease management and get acquainted with the concept of vaccination
- To understand the mechanism of techniques in r DNA technology and the concept of animal cell technology.
- To study the reproductive technologies and different aspects of industrial biotechnology.
- To be aware of the ethical, legal, and social issues related to genetically modified organisms.

COURSE OUTCOMES

CO 1	Understand the basic concepts of immune system and hypersensitivity reactions and apply the same in identification of diseases and describe the triggering and regulation of immunological response.
CO 2	Acquire basic knowledge in r DNA technology and acquaint with the techniques of PCR, hybridization and DNA sequencing.
CO 3	Comprehend Animal Cell Culture technology, Reproductive technologies and techniques.
CO 4	Apply the techniques of animal biotechnology in various fields like industry, medicine, animal husbandry etc., for improving the quality of life.
CO 5	Acquaint with safety measures in using the techniques and develop skills in handling and maintaining laboratory equipment.

Syllabus

I	UNIT – I Immunology – I (Overview of Immune system) Introduction to basic concepts in Immunology Innate and adaptive immunity Cells of immune system Organs of immune system Antigens: Basic properties of antigens B and T cell epitopes, haptens and adjuvant Factors influencing immunogenicity	13hrs
II	UNIT – II Immunology – II (Antigens, Antibodies, MHC and Hypersensitivity) Antibodies Antigen – antibody reactions Structure of antibody Classes and functions of antibodies Structure and functions of major histocompatibility complexes Exogenous and Endogenous pathways of antigen presentation and processing Hypersensitivity – Classification and Types Basic properties and functions of cytokines Vaccines and Immunization programme	17hrs
III	UNIT – III Biotechnology – I (Techniques of Recombinant DNA technology) Genetic Engineering: Basic concept, Vectors, Restriction Endonucleases and Recombinant DNA technology Gene delivery: Microinjection, electroporation, biolistic method (gene gun), liposome and viral-mediated gene delivery PCR: Principle, procedure and advantages of PCR DNA Sequencing: Maxam Gilbert and Sanger's methods of DNA sequencing- traditional and automated sequencing Hybridization techniques: Southern, Northern and Western blotting	11hrs
IV	UNIT – IV Biotechnology – II (Cell culture techniques) Animal Cell, Tissue and Organ culture media: Natural and Synthetic media Cell cultures Establishment of cell culture: Primary culture, Protocols for Primary Cell Culture and Secondary culture Types of cell lines: Continuous and Established Cell lines (common examples such as MRC, HeLa, CHO, BHK,Vero) Organ culture; Cryopreservation of cultures Stem cells: Types of stem cells and applications Hybridoma Technology: Production & applications of Monoclonal antibodies(mAb)	11hrs
V	UNIT – V Biotechnology – III (Applications of Animal Biotechnology). Transgenesis: Production of Transgenic animals: sheep and fish Ethical, Legal, Social and Disposable issues of Genetically Modified Organisms Manipulation of reproduction in animals: Artificial Insemination, *In vitro* fertilization, super ovulation, Embryo transfer, Embryo cloning Applications in Industry: Fermentation: Different types of Fermentation and Downstream processing	8hrs

TEXT BOOKS:

1. B.D.Singh, Biotechnology, Kalyani Publishers, 1998 (reprint 2001)
2. Armugam, A Text Book of Immunology, Saras Publications

REFERENCE BOOKS

1. Immunology by Ivan M. Riott
2. Immunology by Kubey
3. Sree Krishna V. 2005. *Biotechnology –I, Cell Biology and Genetics.*New Age International Publ.New Delhi, India.

Course Delivery method: Face-to-face / Blended.
Course has focused on: Foundation

CO-CURRICULAR ACTIVITIES:

- Organizing awareness on immunization importance in local village in association with NCC and NSS teams
- Charts on types of cells and organs of immune system
- Student study projects on aspects such as – identification of allergies among students (hypersensitivity), blood groups in the class (antigens and antibodies duly reported) etc., as per the creativity and vision of the lecturer and students
- Visit to research laboratory in any University as part of Zoological tour and exposure and/or hands-on training on animal cell culture.
- Visit to biotechnological laboratory in university or any central/state institutes and create awareness on PCR, DNA finger printing and blot techniques or Visit to a fermentation industry

Weblinks:

https://www.youtube.com/watch?v=EfNY0aiYRIE
https://www.youtube.com/watch?v=R69M7NuBNBA
https://www.youtube.com/watch?v=hqs57VsSk7s
https://www.youtube.com/watch?v=8rAgLPb85N0

D.A Kiranmayee
Signature of the Course In-charge

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Signature of the HOD

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Semester IV*w.e.f. 2022-2023*
(Model question paper)
Title of the paper: Immunology and Animal Biotechnology
Code – ZOOT01
Time: 3hrs. **max.marks: 75**

Draw neat labelled diagrams wherever necessary for sections A and B.

SECTION –A

Answer and FIVE of the following 5x5=25 Marks

1. Describe the structure and function of Lymph node CO1 L1
2. Role of B – cells in immune system CO1 L2
3. Illustrate the endogenous pathway of antigen presentation and process CO2 L3
4. List out the properties of cytokines CO2 L1
5. Explain the process of microinjection in gene delivery CO3 L2
6. Explain the importance of cryopreservation in cell culture CO4 L3
7. Explain the role of natural media in cell culture CO4 L2
8. Mention the significance of superovulation in animal husbandry CO5 L4

SECTION – B

Answer the following questions 5X10=50 Marks

9. Explain the different factors contributing for innate immunity. CO1 L1

Or

List out the different types of vaccines.CO1 L1

10. Describe the structure and function of different types of immunoglobulin. CO2 L2

Or

Give an account of the various hypersensitivity reactions. CO2 L2

11. Explain the principle, procedure and advantages of PCR. CO3 L2

Or

Explain in detail about Maxam-Gilbert method of DNA sequencing. CO3 L2

12. What are cell lines? List out their types with examples CO4 L1

Or

Explain in detail about the production of Monoclonal antibodies through Hybridoma TechnologyCO4 L1

13. What is transgenesis? Explain the production of transgenic sheep. CO5 L2

Or

Explain the significance of downstream processing.CO5 L4

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PRACTICAL - V

w.e.f. 2022-2023.**Title:-**Immunology and Animal Biotechnology

Code: ZOOP01

Credits:- (02)

(2hrs/week)MAX.MARKS: 40

Objectives

- Acquaint with immunological techniques vis-à-vis theory taught in the class room
- Interconnect the theoretical and practical knowledge of immunity with the outer world for the development of a healthier life.
- Demonstrate basic laboratory skills necessary for Biotechnology research
- Apply the lab techniques for taking up research in higher studies

SYLLUBUS:

I. IMMUNOLOGY

1. Demonstration of lymphoid organs (as per UGC guidelines)
2. Histological study of spleen, thymus and lymph nodes (through prepared slides)
3. Blood group determination
4. Demonstration of
   a. ELISA - Pregnancy Test and HBs Ag,
   b. Immunoelctrophoresis - Malarial parasite (cells) and VDRL

II. ANIMAL BIOTECHNOLOGY

1. Preparation of culture media.
2. DNA quantification using by agarosegel electrophoresis (by using Lambda DNA as standard) Method.
2. Techniques: Western Blot, Southern Hybridization,
3. study of the following techniques through
A. Paper chromatography
B. Thin layer chromatography.
4. Cleaning and sterilization of glass and plastic wares for cell culture.
5. Project work.

SUGGESTED MANUALS

1. Immunology Lab Biology 477 Lab Manual; Spring 2016 Dr. Julie Jameson
2. Practical Immunology A Laboratory Manual; LAP LAMBERT Academic Publishing
3. Manual of Laboratory Experiments in Cell Biology - Edward, G
4. Laboratory Techniques – Plummer

Course Delivery method: Face-to-face / Blended.
Course has focused on: skill development

CO CURRICULAR ACTIVITIES

- Charts on types of cells and organs of immune system
- Student study projects on aspects such as – identification of allergies among students (hypersensitivity), blood groups in the class (antigens and antibodies duly reported) etc., as per the creativity and vision of the lecturer and students
- Visit to research laboratory in any University as part of Zoological tour and exposure and/or hands-on training on animal cell culture.
- Visit to biotechnological laboratory in university or any central/state institutes and create awareness on PCR, DNA finger printing and blot techniques or Visit to a fermentation industry

WEBLINKS:

https://www.youtube.com/watch?v=Svoipyl6IRc
https://www.youtube.com/watch?v=I_CAmtiwmyQ
https://www.youtube.com/watch?v=LlGHHueBVVg
https://www.youtube.com/watch?v=4srp4ooLYNg
https://www.youtube.com/watch?v=_rp4mAHeYmE

D.A. Kiranmayee
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PAPER – IV

Title: Immunology and Animal Biotechnology

w.e.f.2022-23.

Time:3hrs *Model Question paper (External)*Max.Marks: 40 M.

Paper Code: ZOOP01

I. Analyse the given sample for HBs Ag/HIV/Malarial parasite/VDRL/Ra factor 8 M

Principle : 2M
Procedure : 4M
Result : 2M

III. Identify the sample using paper chromatography technique 10M

Principle : 3M
Procedure : 5M
Result : 2M

IV. Identify, draw labelled diagram and comment on 3x4=12 M

A. Lymphoid organ	Identification : 1M
B. Histology slide	Diagram : 1M
C. Glass ware for cell culture	Notes : 2M

V. Practical Record Book 5 M

VI. Viva 5 M

SKILL DEVELOPMENT COURSE OFFERED BY

THE DEPARTMENT OF ZOOLOGY

DURING -2022-2023

ADUSUMILLI GOPALAKRISHNAIAH & SUGAR CANE GROWERS SIDDHARTHA DEGREE COLLEGE OF ARTS & SCIENCE, VUYYURU-521165, KRISHNA Dt., A.P. (AUTONOMOUS).

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Title of the Paper:**Poultry Farming**

Semester: - II

Course Code	**SDCZOOT01**	Course Delivery Method	Class Room/Blended Mode - Both
Credits	2	CIA Marks	15
No. of Lecture Hours/ Week	2	Semester End Exam Marks	35
Total Number of Lecture Hours	08	Total Marks	50
Year of Introduction :	Year of Offering 2021-2022	Year of Revision – 2022-23	Percentage of Revision: 0%

SKILL DEVELOPMENT COURSE	Course code:SDCZOOT01	***2022-2023***	**I BA, MPCS, MSCS & MCCS, ABC&BZC,**

Learning Outcomes:

By successful completion of the course, students will be able to;

1. Understand the field level structure and functioning of insurance sector and its role in protecting the risks
2. Comprehend pertaining skills and their application for promoting insurance coverage
3. Prepare better for the Insurance Agent examination conducted by IRDA
4. Plan 'promoting insurance coverage practice' as one of the career options.

COURSE OUTCOMES

CO 1	Understand the basic concepts of poultry farming andapply the same in the management practices of poultry farming.
CO 2	Acquire knowledge in the preparation of project report for banking and insurance.
CO 3	Acquaint with the poultry feed management practices
CO 4	Understand the nutrient requirements for different stages of layers and broilers
CO 5	Gain knowledge in harvesting of eggs and recycling of poultry waste.

Syllabus

Course Details

Unit	Learning Units	Lecture Hours
I	**Section I (Introduction to Poultry Farming):** General introduction to poultry farming -Definition of Poultry; past and present scenario of poultry industry in India. Principles of poultry housing. Poultry houses, Systems of poultry farming. Management of chicks, growers and layers. Management of Broilers. Preparation of project report for banking and insurance	10
II	**Section II (Feed and Livestock Health Management):** Poultry feed management – Principles of feeding, Nutrient requirements for different stages of layers and broilers. Feed formulation and Methods of feeding. Poultry diseases – viral, bacterial, fungal and parasitic (two each); symptoms, control and management; Vaccination programme.	**10**
III	**Section III (Harvesting of Eggs and Sanitation):** Selection, care and handling of hatching eggs. Egg testing Methods of hatching. Brooding and rearing. Sexing of chicks. Farm and Water Hygiene, Recycling of poultry waste.	**10**

Co- Curricular Activities suggested: (4 Hrs)

1. Group discussion& SWOT analysis
2. Visit to a poultry farm
3. Invited Lectures by Concerned officers of government or private farms
4. Cheap and Healthy Feed preparation by students based on government standards
5. Market study and Survey (Monitoring of daily price hike in poultry market and analysis)
6. Online Swayam Moocs course on poultry farming (see reference 9 below)

Reference books:

1. Sreenivasaiah., P. V., 2015. Textbook of Poultry Science. 1st Edition. Write & Print Publications, New Delhi

2. 2. Jull A. Morley, 2007. Successful Poultry Management. 2nd Edition. Biotech Books, New Delhi"

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(Autonomous)

Semester –II
w.e.f. 2022-20223Time: 90 mins (Model question paper)
Title of the paper: Poultry Farming.Code – SDCZOOT01
Max.marks: 35

Section – A

Answer any **Three** questions. Each question carries **five** marks.***3 x 5= 15.***

1. Poultry house
2. Broilers
3. Methods of feeding
4. Any two bacterial diseases of poultry
5. Egg testing

Section – B

Answer any **TWO** questions. Each question carries **Ten** marks. ***2 x 10 =20***

1. Explain principles of poultry housing in detail, with examples.

2. Write an essay on viral diseases of poultry.

3. Give an account of fungal and bacterial diseases (any two each) of poultry

4.Write an essay on selection, handling and hatching of eggs.

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(AUTONOMOUS)

SEMESTER-II
SKILL DEVELOPMENT COURSE

Guide lines to the paper setter

Time: $1^{1/}_{2}$ hrs

Max.Marks:35

Paper Title: - Poultry Farming.

Paper Code: SDCZOOT01

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*Note:*1. Answer **any THREE** questions out offive in Part-A. Each question carries five marks.3X 5 = 15M.

2. Answer any**TWO**questions out of fourin Part-B. Each question carries 10 marks.2 X 10 = 20M.

	PART	Unit –I	Unit – II	Unit-III
5 Marks Questions	**A**	**2**	**2**	**1**
10 Marks Questions	**B**	**1**	**2**	**1**
Weightage		**20**	**30**	**15**

Note: 1. please provide the scheme of valuation for the paper.

2. Question paper should be both in English and Telugu media.