

PG & RESEARCH DEPARTMENT OF ZOOLOGY

ALLIED ZOOLOGY

(I B.SC CHEMISTRY)

2021 – 2022

| Semester | Paper | Title | Inst hrs | Credit | Exam hrs | Marks | | Total |
|-----------------|--------------|---|---------------------|---------------|---------------------|--------------|------------|--------------|
| | | | | | | I.A | U.E | |
| I | ZUA1 | Allied Course-I - Biology of Invertebrates and Chordates | 4 | 4 | 3 | 25 | 75 | 100 |
| | - | Allied Course –II - Allied Zoology Practical | 3 | - | - | - | - | - |
| II | ZUA2Y | Allied Course – II -Allied Zoology practical | 3 | 3 | 3 | 40 | 60 | 100 |
| | ZUA3 | Allied Course III – Entrepreneurial Zoology | 4 | 4 | 3 | 25 | 75 | 100 |
| | | | 14 | 11 | - | - | - | 300 |

**A.D.M COLLEGE FOR WOMEN (AUTONOMOUS),
Nagapattinam**

UG Programme – Allied Zoology

(For the candidates admitted from 2021 – 2022 onwards)

Bloom's Taxonomy Based Assessment Pattern

Knowledge Level

| | | | | | |
|-----------------------|---------------------------|----------------------|-----------------------|------------------------|----------------------|
| K1 – Recalling | K2 – Understanding | K3 – Applying | K4 – Analyzing | K5 – Evaluating | K6 – Creating |
|-----------------------|---------------------------|----------------------|-----------------------|------------------------|----------------------|

1. Part I, II and III

Theory (External + Internal = 75 + 25 = 100 marks)

| External/Internal | | | | | |
|--------------------------|-----------------------|--------------------|-------------|--------------|---------------------|
| Knowledge Level | Section | Marks | Hrs. | Total | Passing Mark |
| K1-K3 | A (Answer all) | $10 \times 2 = 20$ | 3 | 75 | 30 |
| K3-K6 | B (Either or pattern) | $5 \times 5 = 25$ | | | |
| K3-K6 | C (Answer 3 out of 5) | $3 \times 10 = 30$ | | | |

| | | |
|------------------------------------|--|-------------------|
| Semester-I / Allied Course-I(AC-I) | Biology of Invertebrates and Chordates | Course Code: ZUA1 |
| Instruction Hours: 4 | Credits: 4 | Exam Hours: 3 |
| Internal Marks:25 | External Marks:75 | Total Marks: 100 |

| | | |
|--------------------------|---|---------------------|
| Cognitive Level | K1 -Recalling K2 -Understanding K3 -Applying K4 - Analyzing K5 - Evaluating K6 - Creating | |
| Course Objectives | Course Aims: <ul style="list-style-type: none"> ➤ To understand the Organization and life history of Single cell Organism. ➤ To acquire knowledge on the characteristics and life history of helminthes. ➤ To learn the organization, life cycle and adaptations of prawn, Mussel and Earthworm.. ➤ To study the internal anatomy of Pisces, Amphibian and Reptiles. ➤ To understand the morphology and anatomy of Aves and Mammals | |
| UNIT | Content | No. of Hours |
| I | BIOLOGY OF INVERTEBRATES Organisation and life history Phylum Protozoa - Paramecium. Phylum Porifera - Ascon sponge Phylum Coelenterata - Obelia | 12 |
| II | Organisation and life history Phylum Platyhelminthes - Taenia solium Phylum Aschelminthes - Ascaris Phylum Annelida - Earthworm | 12 |
| III | Organisation and life history Phylum Arthropoda - Tiger Prawn Phylum Mollusca - Freshwater mussel Phylum Echinodermata - Star fish | 12 |

| | | |
|-----------|--|-----------|
| IV | BIOLOGY OF CHORDATES Pisces – Shark – External feature & Respiratory system Amphibia – Frog – External feature , Excretory & Circulatory system Reptilia – Calotes – External feature & Structure of Brain | 12 |
| V | Aves – Pigeon – External feature , Respiratory system & Flight adaptation Mammalia – Rabbit – Dentition, Digestive system and Urinogenital system | 12 |

Text Book:

1. Nair,N.C., Leelavathy, S., Soundarapandian, N., Murugan, T., and Arumugam, N. 2010.
2. A Text Book Of Invertebrates. Saras Publication, Nagercoil. 3rd Edition. ISBN: 978-81-89941-53-6.

Reference books:

1. Jordan,E.L., and Verma,P.S. 2014. Invertebrate Zoology. S.Chand Pub. New Delhi. ISBN:81-219-0367-X.
2. Prasad,S.N.,and Kashyap,V.,2011.A Text Book of Vertebrate Zoology,New age International (P) LTD., Publishers, New Delhi. 14th Edition – Pages:710.
3. Thangamani,A.,Prasannakumar.S.,Narayanan,L.M., and Arumugam,N.,2014. A Text Book of Chordates, Saras Publication, Nagercoil. 25th Edition – Pages: 956.

Web Resources:

1. <https://www.hhrc.ac.in/ePortal/Zoology/I.B.Sc-%20ZoologyEM-18UZ01-Dr.T.PRABU.pdf>
2. http://eclass.bsnyvgcollege.co.in/Admin/WebDoc/pdf/Econtent_Pdf_GeneralCharacterandClassificationofPisces.pdf

Course Outcome

On completion of the Course, Students should be able to

- Understood the Organization and .life history of Single cell Organism.
- Acquired knowledge on the characteristics and life history of helminthes.
- Learn the organization, life cycle and adaptations of prawn, Mussel and Earthworm..
- Study the internal anatomy of Pisces, Amphibian and Reptiles.
- Understand the morphology and anatomy of Aves and Mammals

Mapping of COs with POs & PSOs

| CO/PO | PO | | | | | PSO | | | | |
|-------|----|---|---|---|---|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| CO1 | S | S | S | S | M | S | S | S | S | S |
| CO2 | S | S | S | S | M | S | S | S | S | S |
| CO3 | S | S | S | S | S | S | S | S | S | S |
| CO4 | S | S | S | S | S | S | S | S | S | S |
| CO5 | S | S | S | S | S | S | S | S | S | S |

S- Strongly correlated

M-Moderately correlated

W-Weakly correlated

N-No Correlation

| | | |
|------------------------------------|--|---------------------------|
| Semester- II / Allied practical -I | Biology of Invertebrates and Chordates and Entrepreneur Zoology | Course Code: ZUA2Y |
| Instruction Hours: 6 | Credits: 3 | Exam Hours: 3 |
| Internal Marks:40 | External Marks:60 | Total Marks: 100 |

| | | |
|--------------------------|---|---------------------|
| Course Objectives | Course Aims: | |
| | <ul style="list-style-type: none"> ➤ To dissect the internal organs of Earthworm, Mussel and Fish. ➤ To mount the important body parts of earthworm, Cockroach, Honey bee, Mosquito and Shark. ➤ To know the taxonomic characters of invertebrates and chordate animals. ➤ To know the production of invertebrates and chordate animals ➤ To learn the byproducts of vermicompost, Silk, pearls, Egg and fish liver oil. | |
| UNIT | Content | No. of Hours |
| I | I DISSECTION 1. Earthworm- Digestive system and Nervous system 2. Freshwater Mussel- Alimentary canal 3. Fish – Digestive system | 18 |
| II | II MOUNTING 1. Earthworm - Body setae and Pineal setae 2. Mouthparts - Cockroach, Honey Bee and Mosquito 3. Shark - Placoid scales | 18 |
| III | III SPOTTERS Invertebrata <i>Paramecium caudatum</i> – Entire, Paramecium – Conjugation, <i>Obelia geniculata</i> - Entire <i>Taenia solium</i> – Entire, Scolex, Neries, Pila, Star fish Chordata Shark, Flying fish, Hyla, Bufo, Calotes, Cobra, Pigeon, Bat, Rabbit. | 18 |
| IV | Entrepreneurial Zoology 1.Earthworm, Honey Bee, Lac insect, Silk Insect, Catla, Rohu, Mirgal, Tiger Prawn, Pearl oyster and Hen | 18 |
| V | Products of Animal Vermicompost, Honey, Lac, Silk,Pearl , Hen egg, Fish liver oil A record of lab work should be maintained and submitted at the time of practical examination for valuation | 18 |

Text Books:

- 1.EKAMBARANATHA AYYAR M and ANANTHAKRISHNAN.T.N(1994)Manual of Zoology vol.I, S.Viswanathan pvt.Ltd.,Madras.
- 2.AYYAR E.M and ANANTHAKRISHNAN .T.N ,1992. Manual of zoology ,Vo.II(chordata), Viswanathan .S (Printers and Publishers), Pvt., Ltd., Madras 981pp.

Reference Books:

- 1.BARNES R.D.(1968)Invertebrate zoology W.B.,Saunders company, Philadephia.
- 2.CHENG (1964) Parasitology. W.B.company, Philadephia.
- 3.JORDON, E.L and VERMA .P.S. 1955. Chordate Zoology and Elements of Animal Physiology., S.Chand & Co.
- 4.KOPTAL , R.L(1997) Modern Text Book of Zoology Vertebrates, Rastogi Publications Meerut, India.
- 5.MAJUPURIA T.C., 1978. Introduction to Chordates, Pradeep Publications, Jullundur.
- 6.PARKER and HASEWELL .1964.Text book of zoology Vol.II (Chordata), A.Z.T.B.S Publishers and distributiors , New Delhi 110051m 952 pp

Web Resources:

Earthworm Dissection: <https://www.youtube.com/watch?v=aCnwF6vtE2g>
Fish placoid scales: <https://www.youtube.com/watch?v=RfBg3NuxcgM>

Course Outcome

On completion of the Course, Students should be able to

- Ability to dissect the internal organs of Earthworm, Mussel and Fish.
- Skill to mount the important body parts of earthworm, Cockroach, Honey bee, Mosquito and Shark.
- Understand the key taxonomic characters to identify invertebrates and chordate animals.
- Learn the commercial production of invertebrates and chordate animals
- Skill to produce the byproducts of vermicompost, Silk, pearls, Egg and fish liver oil.

Mapping of COs with POs & PSOs

| CO/PO | PO | | | | | PSO | | | | |
|-------|----|---|---|---|---|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| CO1 | S | S | S | S | M | S | S | S | S | M |
| CO2 | S | S | S | S | M | S | S | S | S | S |
| CO3 | S | S | M | S | S | S | S | S | S | M |
| CO4 | S | S | S | S | S | S | S | S | M | S |
| CO5 | S | M | S | S | S | M | S | S | S | S |

S- Strongly correlated

M-Moderately correlated

W-Weakly correlated

N-No Correlation

| | | |
|------------------------------------|-------------------------|-------------------|
| Semester-II / Allied Course-II(AC) | Entrepreneurial Zoology | Course Code: ZUA3 |
| Instruction Hours: 4 | Credits: 4 | Exam Hours: 3 |
| Internal Marks:25 | External Marks:75 | Total Marks: 100 |

| | |
|--------------------------|---|
| Cognitive Level | K1 -Recalling K2 -Understanding K3 -Applying K4 - Analyzing K5 - Evaluating K6 - Creating |
| Course Objectives | Course Aims: <ul style="list-style-type: none"> ➤ Acquired knowledge on the Earthworm and its economics. . ➤ To generate employments opportunity in Apiculture. ➤ To learn the biology and life cycle of lac culture and Sericulture. ➤ To motivate to become entrepreneurs in Aquaculture ➤ To develop skill in poultry farming. |

| UNIT | Content | No. of Hours |
|------------|---|--------------|
| I | Vermiculture -Types : <i>Eisenia fetida</i> , <i>Eudrilus ugenia</i> , and <i>Perionyx excavatus</i> Biology of Earthworm – Vermicomposting - Required Conditions – Methods (pit and heap) – Advantages – Economic importance of vermiculture | 12 |
| II | Apiculture – Species of Honey Bee, Types of Honey bee – Newton’s Bee hive – Care and Management – Honey extraction and Honey extracting equipments (Honey extractor, Smoker, Queen excluder, Drone excluder, Bee veil. – Nutritive and Medicinal value of Honey, Advantages –Economic importance of Apiculture. | 12 |
| III | Lac Culture – Life cycle of Lac insect - Economic importance of Lac. Sericulture: Life cycle of <i>Bombyx mori</i> – Economic importance of silk. | 12 |
| IV | Aquaculture – Construction and Management of Pond. Culture practices of Common Carp. Shrimp Culture – <i>Penaeus mondon</i> - Pearl culture | 12 |
| V | Poultry farming – Types of Poultry – Care and Management – Poultry nutrition – Diseases and their management – Composition and Nutritive value of egg- Economics of Poultry production | 12 |

Text Book

1. **Ramasamy,P.**, 1992. Diseases of Shrimps in aquaculture systems, Vanitha publication
2. **Arumugam, N.** Aquaculture Saras Publications.

Reference Book

3. **Shukla, G.S. and Upadhyay V.B.** (1997) Economics Zoology, Rastogi publications, Meerut.
4. **Morse, R.A. 1990.** The ABC and XYZ of Bee Culture 40th Edition A.I. Root & Co., Ohio. Manjuyadav.,(2003).Economic Zoology ,Discovery Publishing House. New Delhi.

Web Resources:

1. <https://www.iaszoology.com/vermiculture/>
2. <https://egov.uok.edu.in/elearning/tutorials/1011020512BR15103CR15Apiculture%20Lac%20culture%20and%20%20sericultureapiculture%20lac%20culture%20and%20%20sericulture%20upload.pdf>

Course Outcome

On completion of the Course, Students should be able to

- Know the vemicompost production and its economics. .
- Ability to generate employments opportunity in Apiculture.
- Learn the lac culture and Sericulture.
- Skill in Aquaculture production
- Skill in poultry farming.

Mapping of COs with POs & PSOs

| CO/PO | PO | | | | | PSO | | | | |
|-------|----|---|---|---|---|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| CO1 | S | S | S | S | S | S | S | S | S | S |
| CO2 | S | S | S | S | S | S | S | S | S | S |
| CO3 | S | S | S | S | S | S | S | S | S | S |
| CO4 | S | S | S | S | S | S | S | S | S | S |
| CO5 | S | S | S | S | S | S | S | S | S | S |

S- Strongly Correlated

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N-No Correlation