

ASD GOVT. DEGREE COLLEGE FOR WOMEN (A)

(Re- Accredited by NAAC with B Grade)

Jagannaickpur, Kakinada, East Godavari, AP – 533002

DEPARTMENT OF ZOOLOGY & AQUACULTURE TECHNOLOGY

ZOOLOGY

Bridge Course

Biology Stream



2023-2024

ASD GOVT DEGREE COLLEGE FOR WOMEN (A), KAKINADA

DEPARTMENT OF ZOOLOGY AND AQUACULTURE TECHNOLOGY

Bridge course 2023-2024

The Department of Zoology & Aquaculture Technology has conducted Bridge Course for Newly joined students of Biology Stream in the academic year 2023-2024. The course was conducted from 30/08/2023 to 09/09/2023.

Syllabus covered during the course:

- Basics in Zoology
- Scope and significance of Zoology
- Branches of Zoology
- Applied Zoology
- Career Opportunities in Zoology
- Recent trends in Zoology
- Role-of Human beings in protecting environment and biodiversity.

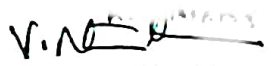
45 students were benefited from this course. This course was intended to bridge the gap between the knowledge they gained in their Intermediate and the knowledge required to begin their UG studies. A pre-bridge course test was conducted before the commencement of course to test the knowledge levels of students and a post- bridge course test was conducted after the completion of the course to assess the achievement of course objectives.

Ms. M.Vasantha Lakshmi- HoD of Zoology, Ms. S.Madhavi- Lecturer in Zoology and Ms. N.Veera Chanti -Guest Faculty in Aquaculture Technology have conducted this course.


Signature of Lecturer in- Charge

DEPARTMENT OF ZOOLOGY
A.S.D. GOVT. COLLEGE FOR WOMEN
KAKINADA
Signature of the Lecturers: 1.

2. 


Signature of the Principal

PRINCIPAL
A.S.D. GOVT. DEGREE COLLEGE
AUTONOMOUS
KAKINADA

Zoology - study of animals. Zoology, or "animal biology", is the branch of biology that relates to the animal kingdom, including the identification, structure, embryology, evolution, classification, habits, and distribution of all animals, both living and extinct, and how they interact with their ecosystems. The term is derived from Ancient Greek word ζῷον (*zōon*), i.e. "animal" and λόγος, (*logos*), i.e. "knowledge, study".^[1] To study the variety of animals that exist (or have existed), see *list of animals by common name* and *lists of animals*.

Branches of zoology

- Acarology - study of mites and ticks
- Arthropodology - study of arthropods as a whole
 - Carcinology - the study of crustaceans
 - Myriapodology - study of milli- and centipedes
 - Arachnology - study of spiders and related animals such as scorpions, pseudoscorpions, and harvestmen, collectively called arachnids
 - Entomology - study of insects
 - Coleopterology - study of beetles
 - Lepidopterology - study of butterflies
 - Melittology - study of bees
 - Myrmecology - study of ants
 - Orthopterology - study of grasshoppers
- Herpetology - study of amphibians and reptiles
 - Batrachology - study of amphibians including frogs and toads, salamanders, newts, and caecilians
 - Cheloniology - study of turtles and tortoises
 - Saurology - study of lizards
 - Serpentology - study of snakes
- Ichthyology - study of fish
- Malacology - study of mollusks
 - Conchology - study of shells
 - Teuthology - study of cephalopods
- Mammalogy - study of mammals
 - Cetology - study of cetaceans
 - Primatology - study of primates
- Ornithology - study of birds
- Parasitology - study of parasites, their hosts, and the relationship between them
 - Helminthology - study of parasitic worms (helminths)
- Planktology - study of plankton, various small drifting plants, animals and microorganisms that inhabit bodies of water
- Protozoology - study of protozoan, the "animal-like" (i.e., motile and heterotrophic) protists
- Nematology - study of nematodes (roundworms)

By nature of studies

Anthrozoology - study of interaction between humans and other animals

Behavioral ecology - study of environmental effects on animal behaviors

- Endocrinology - study of endocrine systems
- Ethology - study of animal behaviour, usually with a focus on behaviour under natural conditions, and viewing behaviour as an evolutionarily adaptive trait

- Neuroethology - study of animal behavior and its underlying mechanistic control by the nervous system
- Paleozoology - the branch of Paleontology that studies animal remains
- Zooarchaeology - study of animal remains in relation to ancient people
- Zoogeography - Zoogeography is the scientific study of geographical distribution of animal species (both historic and contemporary) in the world
- Zoography - Zoography is study of animals and their habitats (also known as descriptive zoology)
- Zoometry - is a sub-division of zoology that deals with measurements (length or size) of animal parts
- Zootomy - Human Anatomy is the study of the structure of humans and their various parts whereas Zootomy specifically refers to animal anatomy
- Zoomorphology - The morphology of animals

Career Opportunities in Zoology:

A zoology degree can lead to a variety of careers in the scientific, environmental, and agricultural industries. Some of the most common career paths for zoology graduates include:

- **Wildlife biologist:** Study and monitor animal populations in their natural habitats.
- **Conservationist:** Work with environmental groups and NGOs to protect endangered species and their habitats.
- **Zookeeper:** Care for and manage animals in zoos and wildlife parks.
- **Research scientist:** Conduct scientific research to expand knowledge about animals, their behavior, and healthy diets.
- **Environmental consultant:** Work with organizations to ensure compliance with environmental regulations.
- **Scientific technical writer:** Write and contribute to scientific documents and reports.

Other careers that a zoology degree can lead to include:

Animal behaviorist, Marine biologist, Ecologist, Animal physiotherapist, Field trials officer, Fisheries officer, Palaeontologist, Toxicologist, Veterinary nurse, and Veterinary surgeon.

Zoologists often need strong written communication skills to articulate their ideas clearly and effectively.

General trends

- Zoology has become animal biology—that is, the life sciences display a new unity, one that is founded on the common basis of all life, on the gene pool–species organization of organisms, and on the obligatory interacting of the components of ecosystems. Even as regards the specialized features of animals—involving physiology, development, or behaviour—the current emphasis is on elucidating the broad biological principles that identify animals as one aspect of nature. Zoology has thus given up its exclusive emphasis on animals—an emphasis maintained from Aristotle’s time well into the 19th century—in favour of a broader view of life. The successes in applying physical and chemical ideas and techniques to life processes have not only unified the life sciences but have also created bridges to other sciences

in a way only dimly foreseen by earlier workers. The practical and theoretical consequences of this trend have just begun to be realized.

- **Methods in zoology**

- Because the study of animals may be concentrated on widely different topics, such as ecosystems and their constituent populations, organisms, cells, and chemical reactions, specific techniques are needed for each kind of investigation. The emphasis on the molecular basis of genetics, development, physiology, behaviour, and ecology has placed increasing importance on those techniques involving cells and their many components. Microscopy, therefore, is a necessary technique in zoology, as are certain physicochemical methods for isolating and characterizing molecules. Computer technology also has a special role in the analysis of animal life. These newer techniques are used in addition to the many classical ones—measurement and experimentation at the tissue, organ, organ system, and organismic levels.

- **Microscopy**

- In addition to continuous improvements in the techniques of staining cells, so that their components can be seen clearly, the light used in microscopy can now be manipulated to make visible certain structures in living cells that are otherwise undetectable. The ability to observe living cells is an advantage of light microscopes over electron microscopes; the latter require the cells to be in an environment that kills them. The particular advantage of the electron microscope, however, is its great powers of magnification. Theoretically, it can resolve single atoms; in biology, however, magnifications of lesser magnitude are most useful in determining the nature of structures lying between whole cells and their constituent molecules.

- **Separation and purification techniques**

- The characterization of components of cellular systems is necessary for biochemical studies. The specific molecular composition of cellular organelles, for example, affects their shape and density (mass per unit volume); as a result, cellular components settle at different rates (and thus can be separated) when they are spun in a centrifuge.

- Other methods of purification rely on other physical properties. Molecules vary in their affinity for the positive or negative pole of an electrical field. Migration to or away from these poles, therefore, occurs at different rates for different molecules and allows their separation; the process is called electrophoresis. The separation of molecules by liquid solvents exploits the fact that the molecules differ in their solubility, and hence they migrate to various degrees as a solvent flows past them. This process, known as chromatography because of the colour used to identify the position of the migrating materials, yields samples of extraordinarily high purity.

- **Radioactive tracers**

- Radioactive compounds are especially useful in biochemical studies involving metabolic pathways of synthesis and degradation. Radioactive compounds are incorporated into cells in the same way as their nonradioactive counterparts. These compounds provide information on the sites of specific metabolic activities within cells and insights into the fates of these compounds in both organisms and the ecosystem.

- **Computers**

Computers process information using their own general language, which is able to complete calculations as complex and diverse as statistical analyses and determinations of enzymatically controlled reaction rates. Computers with access to extensive data files can select information associated with a specific problem and display it to aid the researcher in formulating possible solutions. They help perform routine examinations such as scanning chromosome preparations in order to identify abnormalities in number or shape. Test organisms can be electronically monitored with computers, so that adjustments can be made during experiments; this procedure

improves the quality of the data and allows experimental situations to be fully exploited. Computer simulation is important in analyzing complex problems; as many as 100 variables, for example, are involved in the management of salmon fisheries. Simulation makes possible the development of models that approach the complexities of conditions in nature, a procedure of great value in studying wildlife management and related ecological problems.

- **Applied zoology**

Animal-related industries produce food (meats and dairy products), hides, furs, wool, organic fertilizers, and miscellaneous chemical byproducts. There has been a dramatic increase in the productivity of animal husbandry since the 1870s, largely as a consequence of selective breeding and improved animal nutrition. The purpose of selective breeding is to develop livestock whose desirable traits have strong heritable components and can therefore be propagated. Heritable components are distinguished from environmental factors by determining the coefficient of heritability, which is defined as the ratio of variance in a gene-controlled character to total variance.

- Another aspect of food production is the control of pests. The serious side effects of some chemical pesticides make extremely important the development of effective and safe control mechanisms. Animal food resources include commercial fishing. The development of shellfish resources and fisheries management (*e.g.*, growth of fish in rice paddies in Asia) are important aspects of this industry.

Biodiversity or **biological diversity** is the variety and variability of life on Earth. Biodiversity is a measure of variation at the genetic (genetic variability), species (species diversity), and ecosystem (ecosystem diversity) level." The age of the Earth is about 4.54 billion years. The earliest undisputed evidence of life dates at least from 3.7 billion years ago, during the Eoarchean era after a geological crust started to solidify following the earlier molten Hadean eon. There are microbial mat fossils found in 3.48 billion-year-old sandstone discovered in Western Australia. Other early physical evidence of a biogenic substance is graphite in 3.7 billion-year-old meta-sedimentary rocks discovered in Western Greenland. More recently, in 2015, "remains of biotic life" were found in 4.1 billion-year-old rocks in Western Australia. According to one of the researchers, "If life arose relatively quickly on Earth...then it could be common in the universe."

"Biodiversity" is most commonly used to replace the more clearly-defined and long-established terms, species diversity and species richness.^[13] Biologists most often define biodiversity as the "totality of genes, species and ecosystems of a region".^{[14][15]} An advantage of this definition is that it presents a unified view of the traditional types of biological variety previously identified:

- taxonomic diversity (usually measured at the species diversity level)^[16]
- ecological diversity (often viewed from the perspective of ecosystem diversity)^[16]
- morphological diversity (which stems from genetic diversity and molecular diversity)^[17]
- functional diversity (which is a measure of the number of functionally disparate species within a population (*e.g.* different feeding mechanism, different motility, predator vs prey, etc.)^[18]). This multilevel construct is consistent with Datman and Lovejoy

Forest biological biodiversity [edit]

Forest biological diversity is a broad term that refers to all life forms found within forested areas and the ecological roles they perform. As such, forest biological diversity encompasses not just trees, but the multitude of plants, animals and microorganisms that inhabit forest areas and their associated genetic diversity. Forest biological diversity can be considered at different levels, including ecosystem, landscape, species, population and genetic. Complex interactions can occur within and between these levels. In biologically diverse forests, this complexity allows organisms to adapt to continually changing environmental conditions and to maintain ecosystem functions.

Biodiversity Hotspot

A biodiversity hotspot is a region with a high level of endemic species that have experienced great habitat loss.^[47] The term hotspot was introduced in 1988 by Norman Myers.^{[48][49][50][51]} While hotspots are spread all over the world, the majority are forest areas and most are located in the tropics.

Brazil's Atlantic Forest is considered one such hotspot, containing roughly 20,000 plant species, 1,350 vertebrates and millions of insects, about half of which occur nowhere else.^{[52][53]} The island of Madagascar and India are also particularly notable

Role of an individual in conservation of natural resources –

Conservation of energy:

1. Switch off light, fan and other appliances when not in use.
2. Use solar system heater for cooking.
3. Dry the cloth in the sunlight instead of driers.
4. Use always pressure cookers.

Conservation of water:

1. Use minimum water for all domestic purposes.
2. Use drip irrigation.
3. A rainwater harvesting system should be installed in all the houses.
4. Sewage treatment plants may be installed in all industries and institutions.

Conservation of soil:

1. Grow different types of plants i.e. trees, herbs, and shrubs.
2. In the irrigation process, using a strong flow of water should be avoided.

Conservation of forest:

1. Use non-timber products.
2. Plant more trees.
3. Minimize the use of paper and fuel.
4. Avoid the construction of dam, road in the forest areas.

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Department of Zoology and Aquaculture Technology

Zoology Bridge course Pre-Test questionnaire 2023-2024

1. In Greek "Zoo" means ()
A) Animal B) Ant C) Plant D) Life
2. Branch of Zoology that deals with classification of animals ()
A) Anatomy B) Taxonomy C) Morphology D) Ecology
3. Who is the father of Zoology? ()
A) Aristotle B) Goldfuss C) Haeckel D) Linnaeus
4. Group of cells performing same function is called ()
A) Tissue B) Organ C) System D) Metabolism
5. Largest Phylum among Animalia ()
A) Annelida B) Insecta C) Arthropoda D) Mollusca
6. Bat is a ()
A) Bird B) Mammal C) Dragon D) Fox
7. The cell organelle that helps in amoeboid movement ()
A) Cilia B) Pseudopodium C) Flagella D) Myonemes
8. A zoologist who studies the behavior of animals in their natural habitat is called as ()
A) Ethologist B) Anatomist C) Taxonomist D) Physiologist
9. Apiculture is culturing of ()
A) Fishes B) Birds C) Bees D) Apple
10. Father of Genetics ()
A) Gregor John Mendel B) Hugo devries C) Bateson D) Morghan
11. A zoologist working in a zoo or aquarium is primarily responsible for ()
A) Animal care and conservation B) Financial management
C) Marketing and advertising D) Legal affairs
12. The term biodiversity hotspot was introduced by ()
A). Bateson B). Norman Mayer C). Linnaeus D). Robert Hooke
13. Study of birds is called as ()
A).Entomology B).Ornithology C). Saurology D). Ichthyology

14. Distribution of variable number of species on biosphere is called ()
A). Biodiversity B). Ethology C). Geography D). Zoogeography
15. Study of Cancer is called as ()
A). Radiology B). Carcinology C). Oncology D). Conchology
16. Global warming is due to which gas ()
A). O₂ B). H₂ C). CO₂ D) O₃
17. study of fossils ()
A) Geography B) Palaeontology C) Ethology D) Gerontology
18. Which of the following is a major challenge facing zoological research today? ()
A) Climate change B) Habitat loss C) Pollution D) All of the above
19. The simple microscope was invented by ()
A). Robert Brown B). Robert Hooke C). Linnaeus D) Darwin
20. Environmental protection act was enacted in the year ()
A). 1985 B). 1986 C). 1987 D). 1988

Key: 1).A, 2)B, 3).A, 4).A, 5).C, 6) B, 7).B, 8).A, 9).C, 10).A, 11).A, 12)B, 13).B, 14)D, 15).C, 16)C, 17).B, 18).D, 19).B, 20).B

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Zoology Bridge course Post-Test questionnaire 2023-2024

1. Branch of Zoology that deals with animal habitat ()
A) Anatomy B) Taxonomy C) Morphology D) Ecology
2. Different tissues organize to perform the same function is called ()
A) Tissue B) Organ C) System D) Metabolism
3. Largest class among Animalia ()
A) Sarcodina B) Insecta C) Gastropoda D) Astroidea
4. Largest Animal ()
A) Elephant B) Dinosaur C) Blue whale D) Ostrich
5. Which of the following organizations primarily focuses on wildlife conservation and research? ()
A) World Health Organization (WHO) B) World Wildlife Fund (WWF)
C) International Monetary Fund (IMF) D) United Nations (UN)
6. Find the the radio active element among the following ()
A).C14 B).H1 C). N14 D) O16
7. Which of the following is a potential career path for a zoologist with advanced education and research experience? ()
A) High school science teacher B) University professor
C) Veterinary technician D) Wildlife photographer
8. A zoologist working in a government agency might be involved in: ()
A) Environmental impact assessment B) Food safety inspection
C) Industrial design D) Financial analysis
9. Study of insects is called as ()
A).Entomology B).Ornithology C). Saurology D). Ichthyology
10. Study of animal behaviour is called ()
A). Biodiversity B). Ethology C).Geography D). Zoogeography
11. Study of molluscans is called as ()
A). Radiology B).Carcinology C). Oncology D). Conchology
12. Project dolphin was enacted in the year ()

- A). 2020 B).2021 C).2022 D).2023

13. What is the primary focus of conservation genomics? ()

- A) Studying the genetic diversity of endangered species
B) Using genetic information to inform conservation strategies
C) Developing genetically modified organisms for conservation purposes
D) All of the above

14. What is the role of zoological research in addressing global health challenges? ()

- A) Studying animal diseases can help to identify potential threats to human health
B) Understanding the ecology of disease-carrying organisms can help to prevent outbreaks
C) Developing new vaccines and treatments based on animal models
D) All of the above

15. Who is the father of Human Genetics? ()

- A) Aristotle B) Morghan C) Haeckel D) Linnaeus

16. Aquaculture is culturing of ()

- A) Fishes B) Birds C) Bees D) Apple

17. What is the best way to reduce plastic pollution? ()

- A) Burn all plastic waste B) Reuse and recycle plastics
C) Increase plastic production D) Throw plastic in open areas

18. which of the following actions contributes to sustainable living? ()

- A) Using renewable energy sources B) Over consuming resources
C) Avoiding recycling D) Excessive deforestation

19. What is the role of humans in combating climate change? ()

- A) Reducing carbon footprint B) Ignoring renewable technologies
C) Increasing deforestation D) Promoting wasteful consumption

20. What is a major reason for the loss of biodiversity? ()

- A) Habitat destruction due to human activities B) Creation of national parks
C) Promotion of renewable energy D) Sustainable agriculture practices

Key: 1).B, 2).B, 3).B, 4).C, 5).B, 6) A, 7).B, 8).A, 9).A, 10).B, 11).B, 12)A, 13).B, 14)D, 15).B, 16)A, 17).B, 18).A, 19).A, 20).B

Bridge course attendance 2023-2024

S.No	Name of the Student	30/8/23	31/8/23	01/9/23	02/9/23	04/9/23	05/9/23	06/9/23	07/9/23	08/9/23	09/9/23	Signature of the Student
1.	Boddu Siri Maha Lakshmi	P	P	a	P	a	P	P	a	P	P	B. Siri maha Lakshmi
2.	Boddu Lakshmi Alekhya	P	a	P	P	P	a	a	P	P	P	B.L. Alekhya
3.	Lanka Suvarna Kumari	P	P	a	P	P	P	P	P	a	P	L. Suvarna Kumari
4.	Lanke Archana	P	a	P	P	P	P	P	P	P	a	L. Archana
5.	Vasavi Vanka	P	P	a	P	P	a	P	P	P	P	V. Vasavi
6.	Kandrakota Archana	P	P	P	a	a	P	P	P	a	P	L. Archana
7.	Putta Satya Vani	a	a	a	P	P	P	P	P	P	P	P. satya vani
8.	Guttula Devi Sri	P	P	P	P	a	P	P	P	P	P	G. Devi Sri
9.	Jakki Anitha	P	P	P	P	P	a	P	P	P	P	J. Anitha
10.	Jetla Anupama	P	P	P	P	P	a	P	P	P	P	J. Anupama
11.	Barangi Maithili	P	P	P	P	P	P	a	P	P	P	B. Maithili
12.	Mailapilli Soudaryavathi	P	P	P	P	a	a	P	a	P	P	H. Soudaryavathi
13.	Kukkala Aakanksha	P	a	P	a	P	P	P	P	a	P	K. Aakanksha
14.	Oleti Ramya Sri	P	P	P	P	P	P	P	P	P	a	O. Ramya Sri
15.	Sadhanala Chandana	P	P	P	P	P	a	P	P	a	P	S. Chandana
16.	Seru Sri MahaLakshmi Saranya	P	P	a	P	a	a	P	P	P	P	Saranya
17.	Tadi Sowmya Lakshmi	P	P	P	P	a	P	P	P	P	P	T. Sowmya
18.	Vasupilli Satyaveni	P	P	P	a	P	P	P	P	P	P	V. Satya Veni
19.	Yanamala Tejaswini	P	P	a	P	P	a	P	P	P	P	Y. Tejaswini
20.	Alli Pravallika	P	P	P	P	P	P	P	P	P	P	Y. Tejaswini
21.	Bokka Ishika	P	P	P	P	P	P	a	P	P	P	Y. Tejaswini
22.	Dulapalli Sandhya	P	P	a	P	P	a	P	P	P	P	D. Sandhya
23.	Geddani Manoharshitha	P	P	P	P	P	P	P	P	P	P	G. Manoharshitha
24.	Kollu Jubeda	P	P	P	P	P	P	P	P	P	P	K. Jubeda
25.	Paramata Satya Priya	P	P	P	P	P	P	P	P	a	P	P. Satya Priya

26	Karri Sri Veera Pravallika	P	P	P	P	P	P	a	P	P	P	K. Sri Veera Pravallika
27	Patnala Vyshnavi	a	P	a	P	P	a	P	a	a	P	P. Vyshnavi
28	Pirla Devi Sailaja	P	a	P	P	a	P	P	P	P	P	
29	Mailapalli Navya	P	a	P	P	P	P	P	P	P	P	M. Navya
30	Viparthy Deepika	P	P	P	a	a	P	P	P	P	P	V. Deepika
31	Tamarapu Harini Sai Sri	P	P	P	P	P	P	a	P	P	P	T. Harini Sai Sri

Pre and Post Bridge Course Test Marks

S.No	Name of Student	Pre-Bridge course test marks	Post- Bridge course test marks
1	Boddu Sri Maha Lakshmi	6	20
2	Boddu Lakshmi Alekhya	7	20
3	Lanka Suvarna Kumari	12	16
4	Lanke Archana	12	20
5	Vasavi Vanka	17	17
6	Kandrakota Archana	11	16
7	Putta Satya Vani	12	18
8	Guttula Devi Sri	7	16
9	Jakki Anitha	15	19
10	Jetla Anupama	9	13
11	Barangi Maithili	16	20
12	Mailapilli Soudaryavathi	10	20
13	Kukkala Aakanksha	4	19
14	Oleti Ramya Sri	11	20
15	Sadhanala Chandana	10	19
16	Seru Sri MahaLakshmi Saranya	7	19
17	Tadi Sowmya Lakshmi	6	19
18	Vasupilli Satyaveni	17	18
19	Yanamala Tejaswini	15	20
20	Alli Pravallika	15	20
21	Bokka Ishika	8	20
22	Dulapalli Sandhya	15	20
23	Geddam Manoharshitha	9	17
24	Kollu Jubeda	9	19
25	Paramata Satya Priya	10	19
26	Karri Sri Veera Pravallika	6	19
27	Patnala Vyshnavi	4	16
28	Pirla Devi Sailaja	8	20
29	Mailapalli Navya	13	16
30	Viparathi Deepika	15	20

31	Tamarapu Harini Sai Sri	10	20

M. S. Sai Sri

Signature of the Lecturer Incharge

Lecturer-in-Charge
DEPARTMENT OF ZOOLOGY
A. S. B. GOVT. COLLEGE FOR WOMEN
KAKINADA-2

V. V. V.

Principal

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