



Government of West Bengal
GOVERNMENT GENERAL DEGREE COLLEGE, KHARAGPUR-II
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Department of Zoology

Programme & Course Outcome for (ZOOLOGY) Undergraduate Programme (Choice Based Credit system)

Introduction:

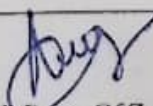
Zoology is the study of all animal life; from primitive microscopic malaria-causing protozoa to large advanced mammals like humans. In order to understand the surroundings, it is important to understand our relationships with animals. For betterment of human being, we need to understand the interconnectedness between man & the animals in the environment. The scope of this subject is wide starting from gaining knowledge about environment, its components to the molecular mechanisms involved in running the machinery of a living body. Without knowing the structure & function of animals it would have not been possible to develop any new medicine/ vaccines for animals including human. No matter what our relation with the animals is, we need to understand their behaviour, population dynamics, physiology and the way they interact with other species and their environments. A student at B.Sc. level in Zoology can be a specialist in immunology, ornithology, animal behaviour, entomology, ecology, apiculture, sericulture & many more.


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Course Structure for Bachelor's Programme in Zoology with details

Name of the Programme	Senmester	Courses Offered
B.Sc. Honours in Zoology	I	CC-1: Non-Chordates CC-2: Ecology
	II	CC-3: Non-Chordates II CC-4: Cell Biology
	III	CC-5: Chordates CC-6: Animal Physiology : Controlling & Coordinating Systems. CC-7: Fundamentals of Biochemist SEC-1: Apiculture GE-3 (Interdisciplinary for other department): Aquatic Biology
	IV	CC-8: Comparative Anatomy of Vertebrates. CC-9: Animal Physiology: Life Sustaining Systems. CC-10: Immunology SEC-2: Sericulture GE-4(Interdisciplinary for other Department): Environment & Pub Health
	V	CC-11: Molecular Biology CC-12: Genetics DSE-1: Reproductive Biology DSE-2: Microbiology
	VI	CC-13: Developmental Biology CC-14: Evolutionary Biology DSE-3: Endocrinology DSE-4: Wildlife Conservation & Management


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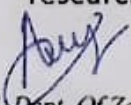
B.Sc. General in Zoology	I	DSC-1A (CC-1): Animal Diversity
	II	DSC-1B (CC-2): Comparative Anatomy & Developmental Biology of Vertebrates.
	III	DSC-1C (CC-3): Physiology & Biochemistry SEC-1: Apiculture
	IV	DSC-1D (CC-4): Genetics & Evolutionary Biology SEC-2: Aquarium Fish Keeping
	V	DSE-1: Aquatic Biology SEC-3: Medical Diagnostics
	VI	DSE-2: Reproductive Biology

Name of the Programme -B.Sc. Honours in Zoology

Programme Outcome (PO)

After completing this programme students will be able:

1. To get comprehensive knowledge about animals & their relationships with humans.
2. To gain understanding of animal diversity in order to appreciate the variety & variability of animals.
3. To gain insight about anatomy & physiology of animals including human beings.
4. To acquire complete knowledge about biology of animals.
5. To get competitive advantage in pursuing higher education.
6. To get required knowledge that will help them to seek jobs in academia, research or companies.




7. To describe different ecological, economic & medical significance of various animals in human life.
8. To getfield knowledge that will help to take up wildlife photography or wildlife conservation as a career options.
9. To acquire practical skills in biochemistry, biotechnology, immunology & molecular biology that can be used in pursuing career as a scientist in drug development industry.
- 10.To acquire basic experimental skills in microbiology, genetics, sectioning, staining, biochemistry that will provide edge to students in higher studies.
- 11.To gain skills that will be helpful in designing different public health strategies for social welfare.
- 12.To contribute as policy makers in wildlife conservation, environment protection & preservation.
- 13.To gain expertise in identifying key factors of wildlife management conservation.
- 14.To develop knowledge & skills in field of apiculture & sericulture.

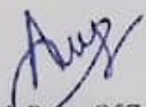
Course Outcomes of this Programme are as follows: -

Name of the Course: Non-Chordatas

Course Outcomes:

After completing this course students will be able to:-

1. To learn about the existence of single-celled animals.
2. To know about the diversity of non-chordates & their difference from humans.
3. To understand the morphology & anatomy of different popular animals of various phyla of non-chordates.


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4. To gain knowledge about the structural organization of different representatives of non-chordates.
5. To learn about economic, ecological & medical significance of various animals in human life.
6. To learn about the importance of taxonomy & systematics in classifying organisms.
7. To witness the diversity of non-chordates in diverse habit & habitats.
8. To identify different disease-causing pathogens.

Name of the Course: CC-2: Ecology

Course Outcomes:

After completing this course students will be able to:-

1. To learn the paramount role & importance of Nature & the different ecosystem services.
2. To gain knowledge of key concepts in ecology like historical perspective, role of physical factors, concept of limiting factors.
3. To develop concept of population: characteristics, dynamics, growth models & interactions.
4. To understand the community characteristics, ecosystem development & climax theories.
5. To gain knowledge about the types of ecosystems, food chains, food webs, energy models & ecological efficiencies.
6. To apply basic principles of ecology in wildlife conservation & management.
7. To demonstrate skills to plot curves, evaluate experimental design, read graphs.
8. To determine concentration of dissolved oxygen, free carbon dioxide, alkalinity etc.
9. To study biodiversity in field.

Name of the Course: Non-Chordates II

Course Outcomes:

After completing this course students will be able to:-

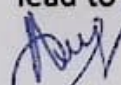
1. To know about the diversity of non-chordates & their difference from humans.
2. To understand the morphology & anatomy of different popular animals of various phyla of non-chordates.
3. To gain knowledge about the structural organization of different representatives of non-chordates.
4. To learn about economic, ecological & medical significance of various animals in human life.
5. To learn about the importance of taxonomy & systematics in classifying organisms.
6. To dissect & display different systems of representative of non-chordate.

Name of the Course: Cell Biology

Course Outcomes:

After completing this course students will be able:-

1. To understand the structure & function of cell.
2. To know how cells carries out regular cellular functions.
3. To understand the differences between prokaryotic & eukaryotic cells.
4. To explain structure & function of cell organelles.
5. To know about cell division, cell survival, cell death.
6. To learn about cell signaling.
7. To gain insights about how defects proper functioning of cell organelles can lead to diseases.


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8. To know the principle & use of microscopy.
9. To learn about cytochemical techniques to study various components of cell.
10. To prepare various stages of meiosis.

Name of the Course: Chordates

Course Outcomes:

After completing this course students will be able:-

1. To know about basic concepts of origin of chordates.
2. To understand the distinguishing features of chordates.
3. To classify chordates into different classes.
4. To understand the similarities & dissimilarities in life functions among various groups of animals in Phylum Chordata.
5. To learn about the different physiological systems of Chordates.
6. To prepare key for identification of poisonous & non-poisonous snakes.
7. To dissect & display different systems in fish.

Name of the Course: Animal Physiology: Controlling & Coordinating Systems.

Course Outcomes:

After completing this course students will be able:-

1. To know about how our body systems work
2. To learn about how homeostasis is maintained in the body.
3. To get an idea about healthy life style practices.

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4. To develop knowledge on role of regulatory systems i.e. endocrine & nervous system & their interplay in maintaining various physiological processes.
5. To demonstrate reflex action.
6. To fix & stain histological sections of mammalian tissues.
7. To identify different histological sections of tissue by studying their characteristic features.

Name of the Paper: Fundamentals of Biochemistry

Course Outcomes:

After completing this course students will be able:-

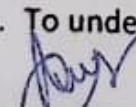
1. To learn the fundamental principles of chemistry in governing the biological systems.
2. To study about the various processes used in industries.
3. To gain foundational knowledge in carbohydrate, protein, lipids, nucleic acids synthesis & metabolism.
4. To know the classical laboratory techniques.
5. To learn about the uses of modern instruments in biochemistry.
6. To understand the nature & actions of enzymes required to carry out various physiological processes.
7. To carry out qualitative test of different biochemicals.
8. To perform quantitative test for different biochemicals.

Name of the Course: SEC-1: Apiculture

Course Outcomes:

After completing this course students will be able:-

1. To understand the biology & behaviour of bees.


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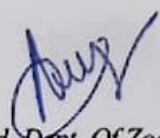
2. To learn about the various species of honey bees in India, their social organization & importance.
3. To learn about the different techniques used in honey bee rearing, optimization of techniques based on climate & geographical regions.
4. To gain knowledge about extraction process of honey from honey bees.
5. To know about the various products obtained from beekeeping farm.
6. To get familiarize with the necessary skills for self-employment in beekeeping industry.
7. To explore the various prospects of apiculture.

Name of the Course: GE-3: Aquatic Biology

Course Outcomes:

After completing this course students will be able:-

1. To know about physico-chemical environment & its role in aquatic system.
2. To gain knowledge of all life forms in the water.
3. To learn about freshwater animals.
4. To learn about saline water animals.
5. To be aware of how human activities influence the physicochemical environment of water bodies.
6. To apply relevant scientific principles in the area of aquatic biology .
7. To educate others or work to conserve natural resources.
8. To gain field knowledge on treatment of sewage, marine bioreserves, fishery.



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Name of the Course: -CC-8: Comparative Anatomy of Vertebrates

Course Outcomes:

After completing this course students will be able:-

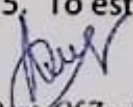
1. To gain knowledge about structural details & comparative account of the different organ systems of the body from lower to higher vertebrates including protochordates.
2. To understand the evolutionary basis of morphological & anatomical differences as well as similarities that occur among vertebrates.
3. To know about the structural modifications of digestive, circulatory, respiratory & skeletal system in relation to the distribution of animals in different habitats.
4. To identify different types of scales.
5. To identify disarticulated skeleton of vertebrates.
6. To differentiate between carapace & plastron by observing them in lab.
7. To dissect & display different systems of vertebrates.

Name of the Course: - Animal Physiology: Life Sustaining Systems.

Course Outcomes:

After completing this course students will be able:-

1. To develop a holistic understanding of the complex physiological systems of the body.
2. To acquire knowledge about core concepts of physiology.
3. To recognize how physiological systems work in unison to maintain homeostasis.
4. To determine blood group of human.
5. To estimate haemoglobin.


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6. To prepare haemin crystals.
7. To record blood pressure of human.
8. To examine sections of different organs of mammals.

Name of the Course: CC-10: Immunology

Course Outcomes:

After completing this course students will be able:-

1. To understand the working of the immune system in normal health.
2. To describe the basic mechanism, differences & functional interplay of innate & adaptive immunity.
3. To define the cellular & molecular pathways of cell mediated & humoral immune responses.
4. To understand the role Major Histocompatibility Complex.
5. To explain the molecular basis of complex, humoral & cellular processes involved in inflammation & immunity.
6. To use the fundamentals of immunology in understanding the basis of vaccination, autoimmunity, immunodeficiency, hypersensitivity & tolerance.
7. To demonstrate lymphoid organs.
8. To determine blood group of human.
9. To count cell by performing cell viability assay.
10. To know principle & basic principle of ELISA Technique by observing the process being done.

Name of the Course:- SEC-2: Sericulture

Course Outcomes:

After completing this course students will be able:-

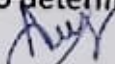
1. To learn about the history of sericulture & silk route.
2. To recognize the various species of silk moths in India, & exotic & indigenous races.
3. To get to know the methods of rearing of silkworm & how silk is obtained from these silkworms.
4. To know about different diseases & predators of silkworm.
5. To get familiarized with the skills necessary for self-employment in mulberry & seed production.
6. To be aware of the opportunities & employment in sericulture industry.

Name of the Course: -GE-4: Environment & Public

Course Outcomes:

After completing this course students will be able:-

1. To familiarize the students with various aspects of environment risks & hazards.
2. To sensitize the students about the climate change due to human activities.
3. To create awareness about various impacts of environmental degradation on human health.
4. To know about the prevention strategies of environmental degradation.
5. To learn about chemical disasters & nuclear disasters & their effects.
6. To acquire knowledge about various waste management technologies & their utility.
7. To diagnose various diseases & know the possible ways of preventing them.
8. To determine pH, Cl, sulphate & nitrate of soil & water samples.


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Name of the Course: - CC-11: Molecular Biology

Course Outcomes:

After completing this course students will be able:-

1. To learn about the structure & synthesis of deoxyribonucleic & ribonucleic acids.
2. To gain knowledge on the machinery & mechanism of DNA replication in prokaryotes & eukaryotes.
3. To compare & contrast the process of DNA replication in prokaryotes & eukaryotes.
4. To elucidate the molecular machinery & mechanism of transfer of genetic information from DNA to RNA i.e. transcription.
5. To understand the need of post-transcriptional modifications for eukaryotic RNAs & also the underlying processes.
6. To learn about the mechanism of final step of transfer of genetic information from RNA to protein i.e. translation.
7. To acquire knowledge on regulation process of transcription in prokaryotes by studying structure & function of lactose & tryptophan metabolism operon.
8. To get an overview on regulation of gene expression in eukaryotes.
9. To explain the mechanism & significance of DNA repair in controlling DNA damage.
10. To understand the role of RNAs in gene expression regulation.
11. To know about giant chromosomes.
12. To gain practical knowledge on how DNA is isolated, quantified & visualized.

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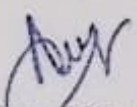
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Name of the Course: - CC-12: Genetics

Course Outcomes:

After completing this course students will be able:-

1. To get an overview of the work of Mendel in genetics.
2. To understand the deviations from Mendel's laws of genetics.
3. To learn about causes of variation in animals, phenomena of linkage & crossing-over.
4. To get a detailed understanding of different types of mutations & the syndromes associated with this.
5. To draw chromosome maps by applying the knowledge of linkage & recombination.
6. To be aware about the harmful impact of various chemicals & drugs used in our daily life.
7. To make people aware of the deleterious effects of such chemicals.
8. To gain understanding of the existence of two sexes in fruit fly & man & also the mechanisms involved in sex determination of fruit fly & man.
9. To acquire knowledge on genetic recombination in bacteria.
10. To get an idea of extra-chromosomal inheritance.
11. To get basic understanding of transposable genetic elements.
12. To describe & analyze pedigree for understanding the pattern of inheritance of several genetic disorders.
13. To apply non-parametric chi-square test in different problems of genetics.
14. To draw linkage maps based on conjugation.


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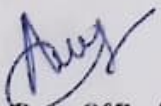
15. To identify different chromosomal abnormalities from human karyotype & also know about their causes & symptoms.

Name of the Course: - DSE-1: Reproductive Biology

Course Outcomes:

After completing this course students will be able:-

1. To gain in-depth knowledge of morphology, anatomy & histology of male & female reproductive system.
2. To obtain knowledge of different processes in reproduction starting from germ cell formation to fertilization, pregnancy, parturition & lactation.
3. To acquire knowledge on interplay of various hormones in functioning & regulation of male & female reproductive systems.
4. To gain knowledge of the diagnosis & management of infertility & to know latest technologies in assisted reproduction.
5. To acquire practical knowledge on animal house set up.
6. To compare estrous cycle with that of menstrual cycle by studying it from vaginal smear of rats.
7. To gain practical understanding of modern methods in contraception & their use in family planning strategies.
8. To identify different histological sections of male & female reproductive organs.
9. To carry out sperm count & sperm motility.
10. To learn about different surgical techniques like ovariectomy, hysterectomy, vasectomy & castration etc.


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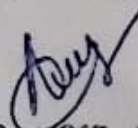
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Name of the Course: - DSE-2: Microbiology

Course Outcomes:

After completing this course students will be able:-

1. To know about different prokaryotic & eukaryotic microscopic pathogens.
2. To get an understanding of taxonomy of bacteria.
3. To acquire knowledge on morphology of bacteria & virus.
4. To learn about the distribution of normal flora in the body, their beneficial as well as their harmful effects.
5. To understand the mechanism of bacterial pathogenesis.
6. To know in details about communicable, non-communicable diseases & also about their spread of infection.
7. To learn about the culture techniques of bacteria.
8. To develop knowledge on genetic recombination in bacteria.
9. To know about the causes, symptoms, pathogenesis, mode of action & preventive measures of different common microbial diseases which will help them to spread awareness about these amongst the masses.
10. To differentiate Gram positive & Gram negative bacteria by performing Gram staining process.
11. To undergo biochemical test for characterization of microbes.
12. To carry out microbiological examination of milk.
13. To perform sugar fermentation test.
14. To spread awareness to people about different good & bad effects of our invisible friend & foe i.e. microbes.


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Name of the Course: - CC-13: Developmental Biology

Course Outcomes:

After completing this course students will be able:-

1. To understand the most fascinating aspect of development of how a single cell can give rise to a adult human being.
2. To learn about basic principles & concepts underlying developmental processes at the cellular & molecular level.
3. To understand the process of formation of an organized body by studying model organisms.
4. To understand basic steps of development starting from gametogenesis to organogenesis.
5. To learn about process of increase in cell number from single celled zygote.
6. To acquire knowledge about different types cell movements which occurs during development & and its necessity.
7. To understand how gastrulation leads to formation of germ layers.
8. To know the process of formation of placenta & and its types in different mammals.
9. To learn the formation & importance of extra-embryonic membranes in birds.
10. To know in detail how implantation occur in humans.
11. To acquire fundamental knowledge of brain formation, eye formation, metamorphosis, regeneration.
12. To relate to the errors that occur during development leading to congenital disorders.

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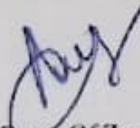
13. To get familiarized with the techniques of IVF, stem cell therapy, amniocentesis, tissue engineering, regenerative medicine etc.
14. To study different developmental stages of chick through permanent slides.
15. To study the life-cycle & developmental stages of fruit fly.
16. To able to identify different sections of placenta.

Name of the Course: - CC-14: Evolutionary Biology

Course Outcomes:

After completing this course students will be able:-

1. To learn about the process & pattern of biological evolution.
2. To gather evidences from fossil records & molecular data & to use them in establishing phylogenetic relationships of species.
3. To get motivated to work towards mitigating climate change so that well adapted species do not face extinctions as a result of sudden drastic changes in environment.
4. To gain knowledge about variations, genetic drift & how these could be applied to ensure that conservation efforts are carried out properly for small threatened populations.
5. To predict the practical implications of various evolutionary forces acting on the human population.
6. To understand the different causes of loss of biodiversity.
7. To learn about phylogeny of *Homo sapiens*.
8. To understand homology & analogy with regard to evolution.


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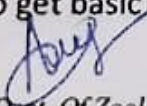
9. To verify Hardy-Weinberg Law using chi-square analysis.
10. To graphically present data of different attributes of a sample.

Name of the Course: - DSE-3: Endocrinology

Course Outcomes:

After completing this course students will be able:-

1. To understand the basics of human endocrine glands, neuroendocrine glands , their structure , function, signaling pathways.
2. To learn about influence of biological rhythm on hormones action.
3. To acquire knowledge on biosynthesis & biochemistry of hormones.
4. To understand the importance of maintenance of homeostasis by the hormones.
5. To know the consequences of hyposecretion, hypersecretion & absence of hormones leading to various diseases & metabolic disorders.
6. To understand the basic properties of hormones.
7. To know about the interplay of nervous system & endocrine system in maintaining homeostasis.
8. To learn about the molecular mechanism of hormone action.
9. To get demonstration on ELISA technique.
10. To study different histological sections of endocrine glands.
11. To witness different endocrine glands in rat.
12. To get basic understanding of fixation, staining of different endocrine glands.


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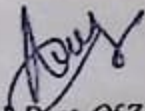
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Name of the Course: - DSE-4: Wildlife Conservation & Management

Course Outcomes:

After completing this course students will be able:-

1. To develop awareness about importance of wildlife in general, its conservation & management in particular.
2. To apply the principles of ecology & animal behaviour to formulate strategies for the management of wildlife populations & their habitats.
3. To understand the management practices needed to achieve healthy ecosystem for wildlife.
4. To know about the key factors for loss of wildlife & important strategies of in-situ & ex-situ wildlife conservation.
5. To understand the techniques for estimation, remote sensing & GPS for wildlife.
6. To get awareness about wildlife diseases & the quarantine policies.
7. To identify different flora fauna of a place.
8. To know about basic equipment needed in wildlife studies.
9. To get familiarized with animal evidences in field.
10. To know different field techniques to study flora & fauna.


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Name of the Programme -B.Sc. General in Zoology

Programme Outcome (PO)

After completing this programme students will be able:

1. To gain understanding of animal diversity in order to appreciate the variety & variability of animals.
2. To gain insight about anatomy & physiology of animals including human beings.
3. To get competitive advantage in pursuing higher education.
4. To get ready for cracking competitive examinations for jobs requiring basic knowledge in Zoology.
5. To describe different ecological, economic & medical significance of various animals in human life.
6. To gain skills that will be helpful in designing different public health strategies for social welfare.
7. To apply for jobs related to forest services, pharmaceutical companies, biological equipment manufacturing companies.

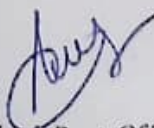
Course Outcomes of this Programme are as follows: -

Name of the Course: - DSC-1A (CC-1): Animal Diversity

Course Outcomes:

After completing this course students will be able:-

1. To know about the diversity of non-chordates & their difference from humans.
2. To understand the morphology & anatomy of different popular animals of various phyla of non-chordates.


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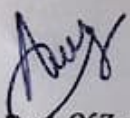
3. To gain knowledge about the structural organization of different representatives of non-chordates.
4. To understand the distinguishing features of chordates.
5. To classify chordates into different classes.
6. To understand the similarities & dissimilarities in life functions among various groups of animals in Phylum Chordata.
7. To learn about the different physiological systems of Chordates.

Name of the Course: - DSC-1B (CC-2): Comparative Anatomy & Developmental Biology of Vertebrates

Course Outcomes:

After completing this course students will be able:-

1. To gain knowledge about structural details & comparative account of the different organ systems of the body from lower to higher vertebrates including protochordates.
2. To understand the evolutionary basis of morphological & anatomical differences as well as similarities that occur among vertebrates.
3. To know about the structural modifications of digestive, circulatory, respiratory & skeletal system in relation to the distribution of animals in different habitats.
4. To identify disarticulated skeleton of vertebrates.
5. To understand the most fascinating aspect of development of how a single cell can give rise to an adult human being.
6. To understand basic steps of development starting from gametogenesis to organogenesis.


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7. To know the process of formation of placenta & and its types in different mammals.
8. To know how implantation occur in humans.
9. To learn about the fundamental processes involved in development.
10. To get knowledge of metamorphosis in frog & different developmental stages of frog development.

Name of the Course: - DSC-1C (CC-3): Physiology & Biochemistry

Course Outcomes:

After completing this course students will be able:-

1. To learn about different physiological processes like digestion, respiration, excretion, cardiovascular process, muscle contraction, electrical coordination, reproduction, endocrine functions etc.
2. To learn the fundamental principles of chemistry in governing the biological systems.
3. To gain foundational knowledge in carbohydrate, protein , lipids, nucleic acids synthesis & metabolism.
4. To acquire knowledge on how enzymes work to control major physiology of body.
6. To prepare haemin crystals.
7. To examine sections of different organs of mammals.

Name of the Course: - SEC-1: Apiculture

Course Outcomes:

After completing this course students will be able:-

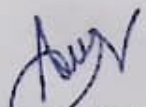
1. To understand the biology & behaviour of bees.
2. To learn about the various species of honey bees in India, their social organization & importance.
3. To learn about the different techniques used in honey bee rearing, optimization of techniques based on climate & geographical regions.
4. To gain knowledge about extraction process of honey from honey bees.
5. To know about the various products obtained from beekeeping farm.
6. To get familiarize with the necessary skills for self-employment in beekeeping industry.
7. To explore the various prospects of apiculture.

Name of the Course: - DSC-1D (CC-4): Genetics & Evolutionary Biology

Course Outcomes:

After completing this course students will be able:-

1. To get an overview of the work of Mendel in genetics.
2. To understand the deviations from Mendel's laws of genetics.
3. To learn about causes of variation in animals, phenomena of linkage & crossing-over.
4. To get a detailed understanding of different types of mutations & the syndromes associated with this.


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5. To draw chromosome maps by applying the knowledge of linkage & recombination.
6. To gain understanding of the existence of two sexes in fruit fly & man & also the mechanisms involved in sex determination of fruit fly & man.
7. To learn about the process & pattern of biological evolution.
2. To gather evidences from fossil records & molecular data & to use them in establishing phylogenetic relationships of species.
3. To get motivated to work towards mitigating climate change so that well adapted species do not face extinctions as a result of sudden drastic changes in environment.
4. To gain knowledge about variations, genetic drift & how these could be applied to ensure that conservation efforts are carried out properly for small threatened populations.
5. To predict the practical implications of various evolutionary forces acting on the human population.
6. To understand the different causes of loss of biodiversity.
7. To learn about phylogeny of *Homo sapiens*.
8. To understand homology & analogy with regard to evolution.
9. To apply non-parametric chi-square test in different problems of genetics.
14. To draw chromosome maps based on linkage & recombination.
15. To identify different chromosomal abnormalities from human karyotype & also know about their causes & symptoms.
16. To get field knowledge by visiting Natural History Museum.

Name of the Course: - SEC-2: Aquarium Fish Keeping

Course Outcomes:

After completing this course students will be able:-

1. To gain basic knowledge about ornamental fish industry.
2. To get scope for career development as an Aquaculturist.
3. To get clear understanding of habits & biology of aquarium fishes which will help them to take up ornamental fish keeping at least at household level.
4. To acquire knowledge of different kinds of fishes & their compatibility in aquarium.
5. To develop awareness of aquarium as commercial, decorative & scientific studies.
6. To gain personal skill development in maintenance of aquarium.
7. To get comprehensive understanding of basic needs of an aquarium like dechlorinated water, reflector, filters, scavengers, aquatic plants, etc.
8. To get overall knowledge on setting of an aquarium in a cost effective manner.

Name of the Course: - DSE-1: Aquatic Biology

Course Outcomes:

After completing this course students will be able:-

1. To know about physico-chemical environment & its role in aquatic system.
2. To gain knowledge of all life forms in the water.
3. To learn about freshwater animals.
4. To learn about saline water animals.

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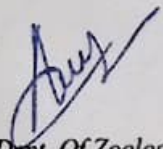
5. To be aware of how human activities influence the physicochemical environment of water bodies.
6. To apply relevant scientific principles in the area of aquatic biology .
7. To educate others or work to conserve natural resources.
8. To gain field knowledge on treatment of sewage, marine bioreserves, fishery.


Name of the Course: - SEC-3: Medical Diagnostics

Course Outcomes:

After completing this course students will be able:-

1. To understand how doctors or clinicians arrive at a conclusion regarding disease prediction, prevention, diagnosis & optimal treatment regimens.
2. To learn about multiple diagnostic tools, techniques & technologies use in medical practices.
3. To gain knowledge about various infections, non-infectious & life-style diseases, tumors & their diagnosis.
4. To know the use of histology & biochemistry of clinical diagnostics.
5. To develop skills in various types of tests & staining procedure involved in hematology, clinical biochemistry & will know the basics of instrument handling.
6. To acquire knowledge on different techniques that are used in the clinical laboratories to investigate various diseases.
7. To gain knowledge about common imaging techniques & their uses in diagnosis of particular disease.


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Name of the Course: - DSE-2: Reproductive Biology

Course Outcomes:

After completing this course students will be able:-

1. To gain in-depth knowledge of morphology, anatomy & histology of male & female reproductive system.
2. To obtain knowledge of different processes in reproduction starting from germ cell formation to fertilization, pregnancy, parturition & lactation.
3. To acquire knowledge on interplay of various hormones in functioning & regulation of male & female reproductive systems.
4. To gain knowledge of the diagnosis & management of infertility & to know latest technologies in assisted reproduction.
5. To acquire practical knowledge on animal house set up.
6. To compare estrous cycle with that of menstrual cycle by studying it from vaginal smear of rats.
7. To gain practical understanding of modern methods in contraception & their use in family planning strategies.
8. To identify different histological sections of male & female reproductive organs.
9. To carry out sperm count & sperm motility.
10. To learn about different surgical techniques like ovariectomy, hysterectomy, vasectomy & castration etc.



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