

**UNIVERSITY COLLEGE FOR WOMEN,
KOTI, HYDERABAD.**

DEPARTMENT OF ZOOLOGY,

B.Sc. SYLLABUS – CBCS

Semester- I and II, Paper- I & II

(With effect from 2019-2020) – Batch
Onwards

DEPARTMENT OF ZOOLOGY
UNIVERSITY COLLEGE FOR WOMEN, KOTI, HYDERABAD
Structure of Syllabus-B.Sc. I year U.G with effect from 2019-20 onwards

S. No	Year/ Sem	Code	Title of the paper		No. of Periods		No. of Credits	Marks
1.	B.Sc I yr/ Sem I	CC/Z/01/101	I	Animal Diversity - Invertebrates Theory	Theory 4	Practicals	4	100
				Animal Diversity - Invertebrates Practicals				
3.	B.Sc I yr/ Sem II	CC/Z/02/102	II	Animal Diversity - Vertebrates Theory	4		4	100
				Animal Diversity - Vertebrates Practicals		1	1	50

Practical class duration is - 3 hrs

Theory-Internal assessment 20 marks (Average of Two)

External Examination - 80 Marks

Practicals -Internal Assessment-10marks, External examination -40 marks , Total -50 Marks

S.S.

Vankar

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15/7

Heenakshi
18.7.19

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B. Venkatesh
18/7/19

K.Y. Chitra
18.7.2019

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DEPARTMENT OF ZOOLOGY, UCW, KOTI, HYDERABAD.

(with effect from 2019-20 Academic year)

SYLLABUS

Course: B.Sc.

Subject code: CC/Z/01/101

Semester: I

No. Of hrs allotted 4hrs/week

Part-III: Core subject(DSC)-Paper-I

No of credits: 4

Periods : 60

Max. Marks: 100

Title of the Paper: ANIMAL DIVERSITY-INVERTEBRATES

Objectives:

To understand the biodiversity adaptation organization and taxonomic status of invertebrates.

To explain the basic aspects of classification, structural and functional details of the invertebrate groups

UNIT – I PROTOZOA AND PORIFERA

(15Hrs)

- 1.1 Kingdom Animalia and Brief history of Invertebrates
- 1.2 General characters & Classification of each phyla up to orders with examples
- 1.3 Type study – *Elphidium*
- 1.4 Locomotion and Reproduction in Protozoa
- 1.5 Luminiscence in protozoa (Radiolarians)
- 1.6 Protozoan diseases: Amoebiasis, Giardiasis, Leishmaniasis and Malaria
- 1.7 Type study – *Sycon*
- 1.8 Canal system in sponges and spicules

UNIT-II COLEENTERATA AND HELMINTHES

(15Hrs)

- 2.1 General Characters And Classification of each phyla upto orders with examples
- 2.2 Type study – *Obelia*
- 2.3 Polymorphism in Siphonophora
- 2.4 Corals and coral reef formation
- 2.5 Type study – *Schistosoma*
- 2.6 Type study – *Dracunculus*
- 2.7 Parasitic adaptation in Helminthes
- 2.8 Phytonematodes- *Meloidogyne, Heterodera.*

UNIT –III ANNELIDA AND ARTHROPODA

(15Hrs)

- 3.1 General Characters and classification of each phyla upto orders with examples
- 3.2 Type study – *Hirudinaria granulosa*
- 3.3 Evolutionary significance of Coelom and Coelomoducts and Metamerism
- 3.4 Type study – *Prawn*
- 3.5 Crustacean Larva
- 3.6 Useful and Harmful insects
- 3.7 Insect Metamorphosis
- 3.8 Peripatus – Structure and affinities

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DEPARTMENT OF ZOOLOGY, UCW, KOTI, HYDERABAD.

(with effect from 2019-20 Academic year)

SYLLABUS

UNIT – IV MOLLUSCA & ECHINODERMATA

(15 Hrs)

- 4.1 General characters of each phyla up to orders with examples
- 4.2 Type study – *Pila*
- 4.3 Pearl formation
- 4.4 Torsion and Detorsion in Gastropoda
- 4.5 Type Study – *Asterias*
- 4.6 Water Vascular system in Echinodermata
- 4.7 Echinoderm Larvae and their evolutionary significance
- 4.8 Regeneration in Echinodermata.

Suggested Reading:

1. H.Hyman 'The Invertebrates' Vol I, II and V- M.C Graw Hill Company Ltd.
2. Kotpal, R.L. 1988 -1982 Protozoa, porifera, colenterata, Helminthes, Arthropoda, Mollusca, Echinodermata, Rastogi Publications, Meerut.
3. E.L. Jordan and P.S. Verma 'Invertebrate Zoology' S.Chand and Company
4. Barnes, R.D. (1982), Invertebrate Zoology, V. Edition
5. Parker, T.J. and Haswell 'A Text book of Zoology' by W.A. Mac Millan co. London.
6. P.S Dhami and J.k Dhami invertebrate zoology, S.Chand and co. New Delhi.

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DEPARTMENT OF ZOOLOGY, UCW, KOTI, HYDERABAD.

(with effect from 2019-20 Academic year)

SYLLABUS

B.SC –SEM-I PAPER-I PRACTICALS

Title of the Paper: ANIMAL DIVERSITY-INVERTEBRATES

Max.Marks :50

Number of hours -3hrs/week

Credits =1

I. Study of Slides /specimens /Models (Classification of Animals upto Orders)

- 1. PROTOZOA:** *Amoeba, Paramecium, Paramecium* Binaryfission and conjugation, *Vorticella, Entamoeba histolytica, Euglena, Noctiluca, Trichomonas, Giardia, Elphidium, Monocystis, Stentor, Opalina, Balantidium Plasmodium.*
- 2. PORIFERA:** *Sycon, Spongilla, Euspongia, Euplectella, Hyalonema* Sycon – T.S and L.S, Spicules, Gemmule.
- 3. COELENTERATA:** *Millepora, Halistemma, Obelia* colony and Medusa, *Aurelia, Physalia, Velella, Porpita, Rhizostoma, Tubipora, Alcyonium, Metridium, Adamsia Meandrina Madrepora, Fungia, Aurelia* developmental stages, *Corallium, Gorgonia, Pennatula*
- 4. PLATYHELMINTHES:** *Planaria, Fasciola hepatica, Fasciola* Larval forms- *Miracidium, Sporocyst, Redia, Cercaria, Metacercaria, Echinococcus granulosus, Taenia solium Schistosoma haematobium.*
- 5. NEMATHELMINTHES:** *Ascaris*(Male and female), *Dracunculus, Strongyloides, Enterobius, Oxyuris, Ancylostoma, Wucheraria*
- 6. ANNELIDA:** *Neries, Heteroneries, Aphrodite, Chaetopterus, Hirudinaria, Sipunculus* Trocophore larva, *Nephridium, body setae, T.S of Leech.*
- 7. ARTHROPODA:** *Cancer, Paleomon, Scorpion, Sacculina, Galeodus, Lepsima, Mantis, Locust, Squilla, Buthus, Daphnia, Cyclops, Limulus, Mysis, Lepas, Paleomon, Scolopendra, Julus, peripatus.* Larval forms of Arthropoda *Zoea, Nauplius metazoea* Mouthparts of male and female *Anopheles and Culex* mosquito, Mouthparts of housefly and butterfly
- 8. MOLLUSCA :** *Chiton, Dentalium, Patella, Limax, Helix, Unio, Pecten, Pinctada, Octopus, Pila, Pteredo, Murex, Sepia, Loligo, Nautilus, Glochidium Larva.*
- 9. ECHINODERMATA:** *Asterias, Ophiothrix, Echinus, Clypeaster, Cucumaria, Antedon, Larval forms of Echinoderms.*
- 10. Prepare the Album containing photograph of two examples for each phyla with appropriate write up**

II. DISSECTIONS:

Prawn –Appendages, Digestive system, Nervous system, mounting of statocyst.

Insect Mouthparts –cockroach.

III, Permanent slide preparation- Paramecium, spicules of Sycon, Obelia colony, Cyclops and Daphnia.

IV. Lab record and Album to be submitted at the time of practical Examination.

Suggested Reading;

- 1. Practical Zoology- Invertebrates- S.S.Lal**
- 2. Practical Zoology- Invertebrates- P.S.Verma**
- 3. Practical Zoology- Invertebrates –K.P.Kurl**

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DEPARTMENT OF ZOOLOGY, UCW, KOTI, HYDERABAD.

(with effect from 2019-20 Academic year)

SYLLABUS

Course: B.Sc

Subject code: CC/Z/02/102

Semester: II

No. Of hrs allotted 4hrs/week

Part-III: Core subject(DSC)-Paper-II

No of credits: 4

Periods :60

Max.Marks: 100

Title of the Paper: ANIMAL DIVERSITY -VERTEBRATES

Objectives:

To understand the general organization of Vertebrates and their classification.

To impart knowledge about the comparative anatomy of different systems in the vertebrate group.

UNIT-1 PROTOCHORDATES, CYCLOSTOMES and CHORDATES

- 1.1 General Characters & Classification of Hemichordata upto classes with examples
- 1.2 *Balanoglossus* structure and affinities
- 1.3 General characters and classification of Urochordates and Cephalochordates
- 1.4 Structure and Life history of an *Ascidian* with emphasis on Retrogressive Metamorphosis
- 1.5 Salient features and affinities of Cephalochordates(*Amphioxus*)
- 1.6 General characters of Cyclostomes, Comparison between *Petromyzon* and *Myxine*

UNIT -II COMPARATIVE ACCOUNT OF PISCES, AMPHIBIA, REPTILIA,

AVES, MAMMALS-I

(15Hrs)

- 2.1 General Characters & Classification of Chordata upto order with examples
- 2.2 General Characters & Classification of Anamniotes
- 2.3 General Characters & Classification of Amniotes
- 2.4 Digestive system
- 2.5 Respiratory system
- 2.6 Circulatory system

UNIT -III COMPARATIVE ACCOUNT OF PISCES, AMPHIBIA, REPTILIA, AVES, MAMMALS-II

- 3.1 Nervous system
- 3.2 Sense Organs
- 3.3 Excretory System
- 3.4 Reproductive system
- 3.5 Jaws & Jaw suspension

UNIT -IV GENERAL ACCOUNT OF VERTEBRATES

(15 Hrs)

- 4.1 Migration of Fishes
- 4.2 Parental care in Pisces Amphibia, Reptilia, Neoteny and Paedogenesis
- 4.3 Temporal fossae in Reptiles and its evolutionary significance
- 4.4 Migration Flight Adaptation in Birds
- 4.5 Dentition in Mammals
- 4.6 Aquatic adaptation in Mammals

Suggested reading:

1. E.L. Jordan and P.S Verma 'Chordate Zoology'- S.Chand publications
2. Mohan P.Arora'Chordata-I, Himalaya Publishing house Pvt Limited
3. Marshal,Parker and Haswell 'TextBook of Vertebrates' ELBS and Mc millan, England.
4. Harvey pough F, Christine M Janis, B. Heiser, Vertebrate Life, Pearson, 6th Ed. Pearson education Inc 2002
5. J.W.Young, The Life of Vertebrates, 3rd ed, Oxford University press

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DEPARTMENT OF ZOOLOGY, UCW, KOTI, HYDERABAD.

(with effect from 2019-20 Academic year)

SYLLABUS

B.SC -SEM-II PAPER-II PRACTICALS

Title of the Paper: :ANIMAL DIVERSITY -VERTEBRATES

Max.Marks :50

No. Of hours allotted; 3 hrs /week

Credits :1

Study of Museum slides/ specimen/ models

1. HEMICHORDATA : *Balanoglossus, Tornaria larva*
2. PROTOCHORDATA: *Herdmania, Amphioxus, T.s through pharynx*
3. CYCLOSTOMATA: *Petromyzon, Myxine and Ammocoetus Larva*
4. PISCES: *Sphyrna ,Scoliodon ,Torpedo, Pristis, Chimera. Channa, Labeo, Clarius, Anguilla, Pleuronectus, Exocoetus ,Hippocampus, Protopterus, Echieneis,Catla .Scales- Placoid, Ganoid , Cycloid. Fins*
5. AMPHIBIA: *Ichthyophis, Ambylostoma, Siren, Hyla, Rachophorus ,Bufo, Rana, Axolotyl larva*
6. REPTILIA : *Draco, Chameleon, Gecko, Uromastix,Testudo , Trionyx, Russels, Viper,Typhlops,Naja, Ptyas ,Bungarus, Enhydrina, Crocodile, Alligator, Gavialis*
7. AVES: *Passer, Psittacula, Bubo, Alcedo, Columbia, Corvus, Pavo, Indian Roller(Pala pitta), Archeopteryx, Eudynamus. Types of Feathers and Beaks, Feet/claw modification, pecten slide.*
8. MAMMALIA : *Ornithorhynchus, Tachyglossus, Macropus, Erinaceus, Pteropus, Manis, Funambulus, Loris, Hedgehog.*
9. Prepare the Album containing photograph of two examples for each phyla with appropriate write up

HISTOLOGY : V.S.of Skin, T.S. of Liver, Pancreas, Kidney, Stomach, Intestine,Lungs, Artery, Vein, bone T.S, spinal cord, Spleen, Cartilage, Blood smear, Testis and ovary

OSTEOLOGY : Appendicular skeleton(Girdles and Limb bones) of Reptiles , Aves and Mammals

DISSECTIONS : Labeo/ Tilapia fish

1. Cranial Nerves
2. Brain, Weberian ossicles
3. Digestive System

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**UNIVERSITY COLLEGE FOR WOMEN,
KOTI, HYDERABAD.**

DEPARTMENT OF ZOOLOGY,

B.Sc. SYLLABUS – CBCS

Semester- III and IV, Paper- III & IV

(With effect from 20 -202, onwards)

onwards

DEPARTMENT OF ZOOLOGY
UNIVERSITY COLLEGE FOR WOMEN, KOTI, HYDERABAD
 Structure of Syllabus-B.Sc.II year U.G with effect from 2019-20 onwards

S. No	Year/ Sem	Code	Title of the paper	No. of Periods		No. of Credits	Marks
				Theory	Practicals		
1.	B.Sc II yr/ Sem III	CC/Z/03/201	<u>Animal Physiology and Animal Behaviour Theory</u>	4		4	100
			<u>Animal Physiology and Animal Behaviour Practicals</u>		1	1	50
		Skill Enhancement Courses	SEC-1 Sericulture SEC-2 Medical Diagnostics	2			50
2.	B.Sc II yr/ Sem IV	CC/Z/03/202	<u>Cell Biology, Genetics and Developmental Biology Theory</u>	4		4	100
			<u>Cell Biology, Genetics and Developmental Biology Practicals</u>		1	1	50
		Skill Enhancement Courses	SEC-3 Vector Biology SEC-4 Biomaterials from Animals sources	2			50

Practical class duration is - 3 hrs

Theory-Internal assessment 20 marks (Average of Two)

External Examination - 80 Marks

Practicals -Internal Assessment-10marks, External examination -40 marks, Total -50 Marks

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B.Sc. ZOOLOGY SYLLABUS UNDER CBCS 2019-20
UNIVERSITY COLLEGE FOR WOMEN, KOTI

Year	Semester	Paper		Title of the Paper	No. of Credits	Exam Hrs.	Max. Marks		
							I.A	End Exam	Total
I	I	Paper - I	Core-I Theory	Animal Diversity- Invertebrates	4	2	20	80	100
			Core-I Practical	Animal Diversity- Invertebrates	1	2	10	40	50
	II	Paper - II	Core-II Theory	Animal Diversity- Vertebrates	4	2	20	80	100
			Core-II Practical	Animal Diversity- Vertebrates	1	2	10	40	50
II	III	Paper - III	Core-III Theory	Animal Physiology and Animal Behaviour	4	2	20	80	100
			Core-III Practical	Animal Physiology and Animal Behaviour	1	2	10	40	50
			SEC-1	Sericulture	2	2	10	40	50
			SEC-2	Medical Diagnostics	2	2	10	40	50
	IV	Paper - IV	Core-IV Theory	Cell Biology, Genetics, and Developmental Biology	4	2	20	80	100
			Core-IV Practical	Cell Biology, Genetics, and Developmental Biology	1	2	10	40	50
			SEC-3	Vector Biology	2	2	10	40	50
			SEC-4	Biomaterials from Animals sources	2	2	10	40	50
III	V	Paper - V	DSE-I Theory	Immunology and Animal Biotechnology	4	2	20	80	100
			DSE -I Practical	Immunology and Animal Biotechnology	1	2	10	40	50
			GE - I Theory	Preventive Medicine	4	2	20	80	100
	VI	Paper - VI	DSE-II Theory	Ecology, Zoogeography and Evolution	4	2	20	80	100
			DSE-II Practical	Ecology, Zoogeography and Evolution	1	2	10	40	50
				Tools and Techniques in Biology	4	2	20	80	100
					16	36	260	1040	1300

DSC – Discipline Specific Core; DSE – Discipline Specific Elective; SEC – Skill enhancement Course; GE- Generic Elective (Open streams)

*Practical one credit equal to 3 hours of instruction

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DEPARTMENT OF ZOOLOGY, UCW, KOTI, HYDERABAD.

B.Sc. Zoology Syllabus under CBSC with effect from 2020-21 onwards Academic year

Course: B.Sc

Subject code: CC/Z/03/203

Semester: III

No. of hrs. allotted 4hrs/week

Part-III: Core subject(DSC)-Paper-III

No of credits: 4

Periods: 60

Max.Marks: 100

Title of the Paper: ANIMAL PHYSIOLOGY and ANIMAL BEHAVIOUR

Objectives:

To study the basic principles of animal physiology, chemical and physical properties of living matter.

To understand the physiology of various organs and organ systems.

To know about the importance of digestive enzymes and their role in digestion.

To study the basic structure and physiological role of excretory, circulatory, respiratory and coordination systems in animals.

To learn about the hormones and hormonal regulations and their defects in Man.

To study the inherent morphological and physiological basis of behavioural pattern exhibited by animals.

UNIT - I

1.1 Digestion

(15Hrs)

1.1.1 Enzymes: Definition, classification, inhibition, regulation, Enzymes in the process of digestion

1.1.2 Digestion- Types of Digestion, Digestion of carbohydrates, proteins, lipids and Cellulose

1.1.3 Absorption, assimilation of digested food

1.1.4 Role of gastrointestinal hormones in digestion

1.2 Excretion

1.2.1 Classification of animals on the basis of excretory products -Ammonotelic, Uricotelic and Ureotelic

1.2.2 Structure and function of nephron and kidney

1.2.3 Urine formation, counter current mechanism, Urea cycle

1.3 Osmoregulation

1.3.1 Osmoregulation in man.

1.3.2 Water and ionic regulation by fresh water, Brackish water and marine water animals

UNIT - II

(15Hrs)

2.1 Homeostasis

2.1.1 Concept of homeostasis with three illustrations viz-Hormonal control of glucose levels-, Thermoregulation, glucose regulation

2.1.2 Mechanism of homeostasis, Temperature regulation in man

2.2 Respiration

2.2. Definition of respiration, respiratory mechanism, external, internal and Cellular Respiration

2.2.1 Respiratory pigments, transport of oxygen, oxygen dissociation curves, Bohr's effect, transport of carbondioxide, chloride shift (Hamburger's phenomena)

2.2.2 Regulation of respiration: nervous and chemical mechanism

2.3 Circulation

2.3.1 Types of circulation: open and closed: Structure of mammalian heart

2.3.2 Types of hearts: neurogenic and myogenic

2.3.3 Heart functions, conduction and regulation of heartbeat, regulation of heart rate

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DEPARTMENT OF ZOOLOGY, UCW, KOTI, HYDERABAD.

B.Sc. Zoology Syllabus under CBSC with effect from 2020-21 onwards Academic year

2.3.4 Tachycardia, bradycardia: blood clotting mechanism, Coagulation and theories of coagulation, ECG

UNIT –III

(15Hrs)

3.1 Muscle contraction (Muscle Physiology)

- 3.1.1 Types of muscles
- 3.1.2 Ultrastructure of skeletal muscle fibre
- 3.1.3 Sliding filament theory of muscle contraction mechanism and energetics
- 3.1.4 Twitch, tetanus, summation, Treppe fatigue

3.2 Nerves (Nerve Physiology)

- 3.2.1 Structure of neuron
- 3.2.2 Resting potential, Threshold potential, Action potential, Conduction of nerve impulse
- 3.2.3 Transmission of nerve impulse
- 3.2.4 Synapse, synaptic transmission, Electrical and Chemical Transmission, neurotransmitters, EPSP, IPSP

3.3 Endocrine systems

- 3.3.1 Endocrine glands- structure, secretion, function of Pituitary, Thyroid, parathyroid, Adrenal gland and pancreas, relationship between hypothalamus and pituitary.
- 3.3.2 Hormone action and concept of secondary messengers
- 3.3.3 Male and female hormones, hormonal control of menstrual cycle in human beings

UNIT – IV

(15Hrs)

4.1 Animal behaviour

- 4.1.1 Types of behaviour: innate, acquired, instinctive and motivated behavior Altruism aggressive and territorial behaviour
- 4.1.2 Taxes, reflexes tropisms

4.2 Learning and memory

- 4.2.1 Types of learning, trial and error learning, imprinting, habituation
- 4.2.2 Conditioning: Classical conditioning, instrumental conditioning, examples of conditioning, Pavlov's experiment

4.3 Social behaviour and communication

- 4.3.1 Social behaviour, communication – Avoiding the predators and finding food, Evolution of Reproductive behaviour (Courtship and mating), Pheromones and Game theory, Colonial existence of bees and termites, pheromones

4.4 Biological rhythms

- 4.4.1 Biological clocks, circadian rhythms, circumlunar rhythms, circannual rhythms,

Outcome of the paper:

Students acquire the knowledge about various organs and organ systems in man and they can get the knowledge about various common problems, or modifications of a particular physiological system to function under diverse conditions and also acquainted with different types of behavioural patterns with relation to external environment.

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B.Sc. Zoology Syllabus under CBSC with effect from 2020-21 onwards Academic year

Suggested Readings:

1. **Generad 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, 22ed, 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 Schmidt-Nielsen**, Animal Physiology, 5thed, Cambridge Low price Edition.
7. **Roger Eckert and Randal**, Animal Physiology, 4thed, Freeman Co, New York.
8. **Singh. H.R.**, Text Book of Animal Physiology and Biochemistry
9. **Nagabhushanam**, Comparative Animal physiology
10. **Veer Bal Rastogi**, Text Book of Animal Physiology.

B.SC –SEM-III PAPER-III PRACTICALS

Title of the Paper: ANIMAL PHYSIOLOGY and ANIMAL BEHAVIOUR

Max.Marks:50

No. of hours allotted: 3 hrs. /week

No. of Credits: 1

1. Qualitative test of identification of carbohydrates, proteins and lipids.
2. Qualitative test of identification of ammonia, urea, uric acid (nitrogenous excretory products).
3. Zonation of gut in cockroaches.
4. Effect of pH and temperature on salivary amylase activity.
5. Study of permanent histological sections of Mammalian Endocrine glands Thyroid, Pancreas, Adrenal gland, Pituitary gland.
6. Estimation of haemoglobin by Sahil's method.
7. Estimation of blood clotting time.
8. Estimation of total protein by Biuret's method.
9. Estimation of Unit oxygen consumption of fish.
10. Loss and Gain of salts in crab in hetero- osmotic media.
11. Geo taxis of earth worm and cockroaches.
12. Observe the response of invertebrates to the Light.

- Laboratory Record work shall be submitted at the time of practical examination
- Computer aided techniques should be adopted as per UGC guide lines.

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DEPARTMENT OF ZOOLOGY, UCW, KOTI, HYDERABAD.

B.Sc. Zoology Syllabus under CBSC with effect from 2020-21 onwards Academic year

Course: B.Sc
Semester: III
SEC- 1:
Periods: 30

Subject code:
No. of hrs. allotted 2hrs/week
No of credits: 2
Max.Marks: 50

Title of the Paper: SERICULTURE

UNIT – I

(15Hrs)

- 1.1 History and economic importance of sericulture-types of silkworm –mulberry and non- Mulberry (Tassar,Eri and Muga)
- 1.2 Systematic position of Bombyx and Life Cycle – Morphology of silk gland.
- 1.3 Horticulture – mulberry cultivation – environmental conditions for mulberry cultivation- soil, climatic factors, preparation of land.
- 1.4 Intercultivation – pruning methods – harvesting
- 1.5 Diseases and pests of mulberry and control methods.

UNIT – II

(15Hrs)

- 2.1 Silkworm rearing – general principles of silkworm rearing – primary requisite for successful rearing.
- 2.2 Feeding of silkworm, bed cleaning, sparing, moulting, late age silkworms – Moulting and Harvesting economics of silkworm.
- 2.3 Diseases and pests of silkworm.
- 2.4 Reeling –reeling appliances and process of reeling cocoons.
- 2.5 Sericulture as cottage industry.

References :

1. Handbook of sericulture – S.R.Ullal and M.N. Varasimhanna .
2. An introduction to sericulture – G.Ganga, J. Sulochana Chetty .
3. Manual of sericulture – FA O Volumes.
4. Handbook of Practical Sericulture: Ullal, S.R. and narasimhanna, M.N. (1987), Central Silk Board Publication, Bangalore.
5. FAO Mauals on Sericulture : Anonymous (1972),Vol-I-IV.
6. Sericulture for Rural Development : Hanumappa (1978), Himalaya Publication.
7. The Silkworm, an important Laboratory Tool : Tazima, y. (1978), Kodanasha Publications, Tokyo.
8. Control of Silkworm Reproduction, Development & Sex: Strunnikov, V.A. (1983),MIR Publications, Mascow.
9. Ericulture in india Sarkar, D.C. (1988), CSB, Bangalore.
10. Silkworm Rearing : Wupang- Chun and Chen Da-Chung (1988),Pub, By FAO.
11. Handbook of Silkworm Rearing: Anonymou (1972), Agriculture and Technical manual-1, Fuzi Pub Co Ltd, Tokyo, Japan.
12. Improved Method of Rearing Young age silkworm : Krishnaswamy (1986), CSB Publication, Bangalore.

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DEPARTMENT OF ZOOLOGY, UCW, KOTI, HYDERABAD.

B.Sc. Zoology Syllabus under CBSC with effect from 2020-21 onwards Academic year

Course: B.Sc
Semester: III
SEC- 2:
Periods: 30

Subject code:
No. of hrs. allotted 2hrs/week
No of credits: 2
Max.Marks:50

Title of the Paper: MEDICAL DIAGNOSTICS

UNIT – I

(15Hrs)

- 1.1 Introduction to medical diagnostic and its importance ✓
- 1.2 Diagnostic methods used for analysis of Blood composition smear preparation . Differential leucocytes count (DLC). Cell counting –RBC, WBC platelet, ESS (Erythrocyte sedimentation Rate), PVC (Packed cell volume) Haemoglobin estimation, Bleeding clotting time. Blood grouping and Rh typing.
- 1.3 Bone marrow study, Haemopoiesis, Blood coagulation and anticoagulants, Blood banking blood transfusion.
- 1.4 Clinical biochemistry – blood glucose, serum protein, LFT (Liver Function Test) Lipid profile LDL, VDL, HDL, cholesterol, creatine kinase, LDH, SGPT, SGOT, Amylase, Bile pigments.
- 1.5 Histopathological techniques, Autopsy and Biopsy FNAC technique.

UNIT – II

(15Hrs)

- 2.1 Urine analysis Physical chemical, Microscopic dialysis analysis of body fluids (CSF Synovial fluid, pleural, pericardial, peritoneal Fluids). Sputum and faecal matter for infection.
- 2.2 ✓ Clinical diagnosis of diseases – bacterial (Tuberculosis and Typhoid) antibiotic sensitivity test, viral –hepatitis, AIDS, Polio, Protozoan malaria, Amoebiasis, Helminthes – Ascaris, Taenia solium, Wucheria.
- 2.3 Clinical diagnosis of non infection diseases – Diabetes, Hypertension, Asthama, Stroke, Arthritis, Heart attack, Cancer –benign, malignant metastasis.
- 2.4 Concept of Edema, Hyperaemia, Haemorrhage, Hemostasis, Thrombosis, Cellular responses-Hyperplasia, Hypertrappy, Metaplasia, Atropy Necrosis, Apoptosis.
- 2.5 Medical Imaging – X-ray, PET (Positron emission tomography), MRI (Magnetic Resonance Imaging), CT Scan ECG, EEG, Echo tests.

Suggested Readings :

1. Cheese brough M.A. Laboratory Manual for Rural Tropical Hospitals, A basis for training course.
2. Kania Mukherjee, Medical Laboratory Techniques Vol-I,II,III, - Tata MC Graw Hill Publishing company.
3. Dr. K.N. Sachdev, Jaypee Brothers, (1988) Clinical Pthology and bacterial and medical publisher.
4. Ramnik Sood, Medical laboratory Techniques – Jaypee Brothers.
5. Prakash, G.Lab Manual on Blood Analysis and Medical Diagnostics, S.Chand and Co.Ltd.
6. Robbions and Cortra, Pathology –I Basis of Disease, VIII Edition, Saunders.
7. Guton A.C and Hall J.E textbook of Medical Physiology, saunders.
8. Park, K. Preventive and social medicine, B.B. Publishers.

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DEPARTMENT OF ZOOLOGY, UCW, KOTI, HYDERABAD.

B.Sc. Zoology Syllabus under CBSC with effect from 2020-21 onwards Academic year

Course: B.Sc
Semester: IV
Part-IV: Core subject (DSC)-Paper-IV
Periods: 60

Subject code: CC/Z/04/204
No. Of hrs allotted 4hrs/week
No. of credits: 4
Max.Marks:100

Title of the Paper: CELL BIOLOGY, GENETICS and DEVELOPMENTAL BIOLOGY

Objectives:

- To analyse the ultra-structure of Prokaryotic and Eukaryotic cell
- To understand the nature replication and modification of genetic material
- To obtain broad concept of gene expression and regulation
- To impart the knowledge on genetic engineering and cloning
- To acquire the knowledge of scope and importance of developmental biology

UNIT-I:

(15Hrs)

1. Cell Biology

- 1.1 Ultra structure of animal cell (Prokaryotic and Eukaryotic), Cell theory.
- 1.2 Structure and function of plasma membrane proteins.
- 1.3 Structure and Function of cell organelles-Endoplasmic reticulum, Golgi body, Ribosomes, Lysosomes, centrosomes, Mitochondria and Nucleus
- 1.4 Chromosome-Structure, types Polytene chromosomes, Lampbrush chromosomes, giant chromosomes
- 1.5 Cell division (Mitosis and Meiosis)- Cell cycle and regulation, Mitotic spindle and Mitotic apparatus, chromosomes movement, cell division and check points.

UNIT-II:

(15Hrs)

2. Molecular Biology

- 2.1 DNA (Deoxyribo Nucleic Acid) - Structure and RNA (Ribo Nucleic Acid)-Structure, types
- 2.2 DNA Replication in Prokaryotes and Eukaryotes
- 2.3 Protein Synthesis – Transcription and Translation
- 2.4 Gene Expression – Genetic Code; Operon concept, Wobble concept
- 2.5 Molecular Biology Techniques- Polymerase chain reaction , Electrophoresis, gene cloning strategies and genetic engineering

UNIT-III:

(15Hrs)

3. Genetics

- 3.1 Mendel's laws of inheritance and Non-Mendelian inheritance, Extra chromosomal inheritance
- 3.2 Linkage, Crossing over and Recombination
- 3.3 Sex determination and Sex-linked and Sex influenced inheritance
- 3.4 Chromosomal Mutations-Deletion, Duplication, Inversion, Translocation, Aneuploidy and Polyploidy; Gene mutations-Induced versus Spontaneous mutations, Interaction of Genes: Lethal genes, Complementary genes, Supplementary genes, Duplicate genes, Epistasis.
- Inborn errors of metabolism

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DEPARTMENT OF ZOOLOGY, UCW, KOTI, HYDERABAD.
B.Sc. Zoology Syllabus under CBSC with effect from 2020-21 onwards Academic year

UNIT-IV:

(15Hrs)

4. Developmental Biology and Embryology

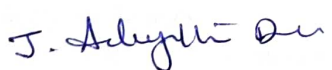
- 4.1 Gametogenesis (Spermatogenesis and Oogenesis) Fertilization, types of eggs, polarity, symmetry, fate maps, Type of cleavages and Gastrulation.
- 4.2 Development of Frog and Chick upto formation of primary germ layers
- 4.3 Formation of Foetal membranes in chick embryo and their functions
- 4.4 Types and functions of Placenta in mammals
- 4.5 Regeneration in and Metamorphosis


Suggested reading:

1. Lodish, Berk, Zipursky, Matsudaria, Baltimore, Darnell 'Molecular Cell Biology' W.H. Free man and company New York.
2. Gardner, E.J. Simmons, M.J., Snustad, D.P. (2008). Principles of Genetics, VIII Edition. Wiley India.
3. Snustad, D.P. Simmons, D.P. (2008) Principles of Genetics, V Edition. John Wiley and Sons Inc.
4. Klug, W.S., Cummings, M.R., Spencer, C.A. (2012). Concepts of Genetics. X Edition. Benjamin Cummings.
5. Russell, P.J. (2009). Genetics – A Molecular Approach. III Edition. Benjamin Cummings.
6. Griffiths, A.J.F., Wessler, S.R. Lewontin, R.C. and Carroll, S.B. Introduction to Genetic Analysis IX Edition. W.H. Freeman and Co.
7. Gupta P.K. 'Genetics'
8. Developmental Biology by Beryll
9. Developmental Biology S. Gilbert
10. Developmental Biology – patterns, problems and principles by W. Saunders Jr.

Outcome of the paper:

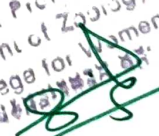
Students acquire the knowledge about basic concepts of Cell biology, Genetics, Molecular biology and developmental biology and they can also get the knowledge about the importance of genetic engineering and biotechnology in relation with human prospective.

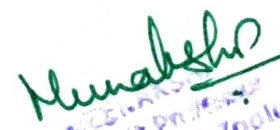

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DEPARTMENT OF ZOOLOGY, UCW, KOTI, HYDERABAD.

B.Sc. Zoology Syllabus under CBSC with effect from 2020-21 onwards Academic year

B.SC-SEM-IV PAPER-IV PRACTICALS

Title of the Paper: CELL BIOLOGY, GENETICS and DEVELOPMENTAL BIOLOGY

Max.Marks:50

No. of hours allotted: 3 hrs /week

No. of Credits: 1

I. Cytology

1. Preparation and identification of slides of Mitotic divisions with onion root tips
2. Preparation and identification of different stages of Meiosis in Grasshopper Testes
3. Identification and study of the following slides
 - i) Different stages of Mitosis and Meiosis
 - ii) Lamp brush and Polytene chromosomes

II. Genetics

1. Problems on Genetics- Mendelian inheritance, Non-Mendelian inheritance, Linkage and crossing over, Sexlinked inheritance, Pedigree Analysis.
2. Estimation of DNA by diphenylamine (DPA) method, localization of DNA by Methyl green and Pyronine –Y method.
3. Estimation of RNA by orcinol method.

III. Embryology

1. Study of T.S. of Testis and Ovary of a mammal
2. Study of different stages of cleavages (2, 4, 8, 16 cell stages); Morula, Blastula, Gastrula
3. Study of chick embryos 18 hours, 24 hours, 33 hours, 48 hours, 72 hours, and 96 hours of incubation.

An "Album" containing photographs, cut outs, with appropriate write-up about Genetics and Evolution

- Laboratory Record work shall be submitted at the time of practical examination
- Computer aided techniques should be adopted as per UGC guide lines.

Suggested Manuals

1. Manual of Laboratory experiments in cell biology Edward, G.
2. Freeman & Bracegirdle, An atlas of embryology

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DEPARTMENT OF ZOOLOGY, UCW, KOTI, HYDERABAD.

B.Sc. Zoology Syllabus under CBSC with effect from 2020-21 onwards Academic year

Course: B.Sc
Semester: IV
SEC- 3:
Periods: 30

Subject code:
No. of hrs. allotted 2hrs/week
No of credits: 2
Max.Marks: 50

Title of the Paper: VECTOR BIOLOGY

UNIT – I: Vector Biology of Public Health Importance

(15Hrs)

- 1.1 Introduction to vectors and vectors of human diseases – Public health nuisance.
- 1.2 Salient features and Life cycle of important Mosquito vector species – Anopheles, Aedes, Culex and Mansonia.
- 1.3 Salient features and life cycle of important other Dipteran vectors of public health importance: Sandflies, Black flies, Houseflies and Myiasis causing flies..
- 1.4 Life cycle and public health importance of – Fleas and lice
- 1.5 Life cycle and public health importance of – Ticks and Mites.

UNIT – II : Basic sanitation and Public Health

(15Hrs)

- 2.1 Basic sanitation – Hygiene and personal protection – Human wastes and Health- Solid waste and Waste water management.
- 2.2 Distinguishing characters of different species of human malarial parasites Life cycle and host Parasite interactions.
- 2.3 Distinguishing characters of different species of human Filarial parasites Life cycle and host Parasite interactions.
- 2.4 Distinguishing characters of different arboviral diseases and their mode of transmission .
- 2.5 Control Measures – Source reduction.

References :

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B.Sc. Zoology Syllabus under CBSC with effect from 2020-21 onwards Academic year

Course: B.Sc
Semester: IV
SEC - 4:
Periods: 30

Subject code:
No. of hrs. allotted 2hrs/week
No of credits: 2
Max.Marks: 50

Title of the Paper: BIOMATERIALS FROM ANIMALS SOURCES

UNIT – I: Biomaterials Introduction

(15Hrs)

- 1.1 Introduction classification, Chemistry and characterization to biomaterial, biocompatibility with medical devices.
- 1.2 Types of biomaterials degradable and reabsorbable materials, hydro gels and natural materials.
- 1.3 Metallic biomaterial, ceramic biomaterials, composite for biomedical applications.
- 1.4 Biomaterials and its applications – muscular skeletal systems.
- 1.5 Delivery of drugs: for tissue engineering and regenerative medicine.

UNIT – II: Biomaterials and their applications

(15Hrs)

- 2.1 Collagen Definition, Types of Collagen, Structure of Collagen, Collagen Sources from Animal Origin such as Bovine, Porcine, Marine and Fishes: Applications in A pharmaceutical, Tissue Engineering and Biomedical Industries.
- 2.2 Introduction to silk biomaterials: Silk fibroin and silk sericin proteins, molecular structure. Properties of silk fibroin : mechanical strength and biocompatibility, Spider dragline silk structure and properties, production from glands, spinning mechanism, Chemical composition and Applications.
- 2.3 Structural Properties, Isolation and Processing Methods, Conversion of Chitin to Chitosan, Chemical and Biological properties; Bio Medical Applications.
- 2.4 Physico Chemical properties, Structure, Synthesis Methods, Mechanism of Action, Physiological Function, wound and Skin Repairs, Receptors of Hyaluronic Acid and Biomedical Applications.
- 2.5 Introduction, elastin- structure, properties, Production from Various sources, Biological Function and Biomedical Applications.

Suggested Readings :

1. Biomaterial science: An Introduction to materials in medicine, Buddy D.Rathner, et.al., Elsevier academic press 3rd edition.
2. Biomaterial compositor by Luigi Ambroio 210 CRC press.
3. Styata V.Bhat. Biomaterial 2nd edition, Naros Publishing House, New Delhi.
4. Biological materials Science, Biological materials, Bioinspired materials, and Biomaterials; Marc Andre Meyers, Po-Yu Chen.
5. Biomaterials, Medical Devices, and Combination Products; Biocompatibility Testing and Safety Assessment; Shanyne Cox Gad, Samantha Gad- McDonald.
6. Biologically Responsive Biomaterials for Tissue Engineering. Iulian Antoniac.

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B.Sc. SYLLABUS – CBCS

Semester- V & VI, Paper- V & VI
(With effect from 2021 -2022 onwards)

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UNIVERSITY COLLEGE FOR WOMEN, KOTI, HYDERABAD
 Structure of Syllabus-B.Sc.III year U.G with effect from 2021-22 onwards

S. No	Year/ Sem	Code	Title of the paper		No.of Periods		No.of Credits	Marks
1.	B.Sc III yr/ Sem V	CC/Z/05/303	I	IMMUNOLOGY AND ANIMAL BIOTECHNOLOGY Theory	4	Practicals	4	100
				IMMUNOLOGY AND ANIMAL BIOTECHNOLOGY Practicals			1	1
		General Elective - I		Preventive Medicine	4			
2.	B.Sc III yr/ Sem VI	CC/Z/05/304	II	ECOLOGY, ZOOGEOGRAPHY AND EVOLUTION Theory	4		4	100
				ECOLOGY, ZOOGEOGRAPHY AND EVOLUTION Practicals		1	1	50
		PROJECT		PROJECT	4			

Practical class duration is - 3 hrs

Theory-Internal assessment 20 marks (Average of Two)


External Examination - 80 Marks


Practicals -Internal Assessment-10marks, External examination -40 marks , Total -50 Marks.


Project: 40 pages Hard Bound Thesis to be submitted during the practical examination


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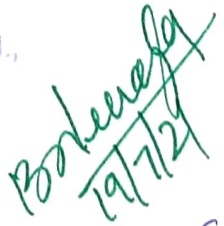
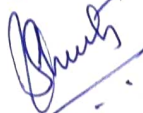

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B.Sc. ZOOLOGY-III YEAR-SEMESTER-V
PAPER-V (DSE-1): IMMUNOLOGY AND ANIMAL BIOTECHNOLOGY

Instructions: 4hr per week
No. of period: 60
No. of credits: 4

UNIT-I: Basics of Immune system:

(15 Periods)

- 1.1 Cells of the immune system- Granulocytes, Dendritic cells, Nk- Cells, APC's, Phagocytes, and the lymphoid organs (Primary and secondary).
- 1.2 First line of defenses-Physical and chemical barriers; second line of defenses-Inflammation and Phagocytosis.
- 1.3 Types of immunity- Inherent(Active and passive) and Acquired immunity(Active and passive), Humoral and Cell-mediated immunity.
- 1.4 Major histocompatibility complex-(MHC)-structure and function of class-I and class-II Proteins, Significance of MHC in organ transplantation, MHC restriction.
- 1.5 Complement System: An Elementary approach

UNIT-II: Antibodies and Antigens and Immune system diseases:

(15 Periods)

- 2.1 Antibodies/Immunoglobulins-structure, functions and classification, antibody diversity, Monoclonal antibodies and applications.
- 2.2 Antigens structure, antigenic determinants/epitopes, haptens, adjuvants and antigenicity.
- 2.3 Antigen-antibody reactions-agglutination, precipitation, opsonization, cytotoxicity.
- 2.4 Hypersensitivity reactions-Type-I, Type-II, Type-III and Type-IV.
- 2.5 Auto immunity and Immuno deficiency diseases.

UNIT-III: Animal Biotechnology and Genetically modified organisms:

(15Periods)

- 3.1 Concept and Scope of Animal Biotechnology.
- 3.2 Cloning vectors-Plasmids, Cosmids and shuttle vectors; Recombinant DNA technology and its applications. Cloning methods (Cell, Animal and Gene cloning).
- 3.3 *In vitro* fertilization and embryo transfer
- 3.4 Transgenesis- Methods of Transgenesis
- 3.5 Production of Transgenic animals- sheep and fish.

UNIT-IV: Applications of Biotechnology:

(15 Periods)

- 4.1 Hybridoma technology- concepts and applications.
- 4.2 Stem cells- Types and their applications.
- 4.3 Animal cell culture-Equipments and materials and Applications
- 4.4 Biopesticides: *Bacillus thuringensis*- Mode of action of toxin.
- 4.5 Animal Bioreactors-concepts and applications.

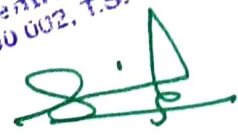

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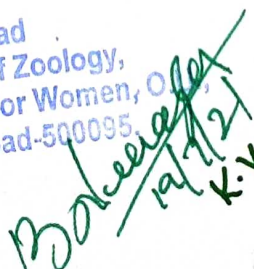
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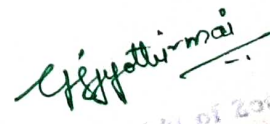

Meenakshi
19/7/21

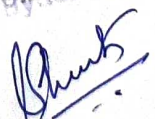

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Chair Person


Reference Books:

1. Text book of immunology- Ivan Riott
2. Text book of immunology- CV.Rao
3. Text book of immunology- Nandini shetty
4. Text book of immunology- Kubey
5. Culture of Animal cells-R.Ian Freshney, WileyLiss.
6. Biotechnology- S.Mitra.
7. Animal Cell culture- Practical Approach- Ed.John RW Masters, Oxford.
8. Biotechnology-B.D.Singh

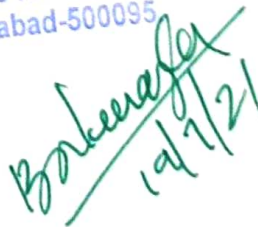

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Dhruv

B.Sc. ZOOLOGY III YEAR PRACTICALS SYLLABUS
SEMESTER-V
PAPER-V (DSE-1): IMMUNOLOGY AND ANIMAL BIOTECHNOLOGY

Instructions: 3hr per week

No. of credits: 1

I. Immunology:

1. Demonstration of agglutination (ABO-blood grouping/Widal test) using kit.
2. Demonstration of precipitation (VDRL/RPR test) using kit.
3. Radial immuno diffusion using kit.
4. Histology of lymphoid organs-Spleen, Thymus, Lymph node, Bone marrow.
5. ELISA/Virtual Lab

II. Animal Biotechnology:

1. Study the following techniques through photographs/virtual lab

- a. Identification of Vectors
- b. Identification of Transgenic animals
- c. DNA sequencing (Sanger's method)
- d. DNA finger printing
- e. Southern blotting
- f. Western blotting

2. PCR demonstration/virtual lab

3. Electrophoresis


4. Visit to CCMB & IICT / Industrial Trip.


- Laboratory Record work shall be submitted at the time of practical examination
- Computer aided techniques should be adopted as per UGC guidelines.


Reference Books:

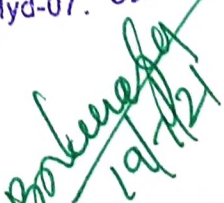
1. A hand book of practical immunology-Ivan Riott
2. Animal Biotechnology-PK Gupta



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B.Sc. ZOOLOGY -III Year
SEMESTER-V
PAPER - V (GE-I): PREVENTIVE MEDICINE

Instructions: 4hr per week
No. of period: 60
No. of credits: 4

UNIT-I: -Man and Medicine: Health for all

(15 periods)

- 1.1. Antiquity medicine, types of medicine.
- 1.2. Dawn of scientific medicine, modern medicine — curative medicine, preventive medicine and social medicine
- 1.3. Definition of health, dimensions of health — Physical, Mental, Social Spiritual, Emotional and Vocational health,
- 1.4. Determinants of health — Biological, Behavioural, Environmental, Socio-economic and Health services
- 1.5. Concept of well being — Standard of living, Level of living and quality of life.

UNIT-11: Principles of Epidemiology

(15 Periods)

- 2.1. Definition of epidemiology, measurements in epidemiology- rates, ratio and proportion.
- 2.2. Epidemiologic methods- observational and experimental studies.
- 2.3. Uses of epidemiology and definitions of infectious disease epidemiology.
- 2.4. Dynamics of disease transmission — source and reservoirs, modes of disease transmission — direct and indirect.
- 2.5. Epidemiological triad, Study of viral epidemiology in context of pandemics

UNIT-IN: Concept of Disease causation

(15 Periods)

- 3.1. Germ theory of Diseases
- 3.2. Disinfection- types of disinfection
- 3.3. Immunity- Active Immunity, Passive immunity, Herd immunity- Zero disease concept by chemoprophylaxis, immunizing agents.
- 3.4. Nutrition and Health — Classification of foods; Nutritional requirements.
- 3.5. Screening of disease — uses of screening, types of screening.


UNIT-IV: Concepts of control & prevention


(15 Periods)

- 4.1. Health care of the community — health care systems, levels of health care.
- 4.2. Modes of health interventions: Health Promotion, Specific Protection, Early Diagnosis and Treatment, Disability Limitations, and Rehabilitations.
- 4.3. Concepts of control - Monitoring and Surveillance.
- 4.4. Concepts of Prevention- Primary, Secondary & Tertiary.
- 4.5. Health programmes in India. Types of Vaccines and immunization.

References:

1. Park's Textbook of Preventive and Social Medicine.

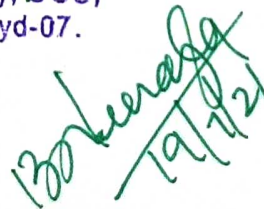

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B.Sc. ZOOLOGY SYLLABUS UNDER CBCS 2021-2022

B.Sc. ZOOLOGY III YEAR
SEMESTER-VI
PAPER-VI (DSE-II): ECOLOGY, ZOOGEOGRAPHY AND
EVOLUTION

Instructions: 4hr per week

No. of period: 60

No. of credits: 4

UNIT - I: Ecology-1

(15 Periods)

- 1.1 Ecosystem structure and functions. Types of Ecosystems - Aquatic and Terrestrial.
- 1.2 Biogeochemical cycles - Nitrogen, Carbon, Phosphorus and Water.
- 1.3 Energy flow in ecosystem, Food chain, food web and ecological pyramids.
- 1.4 Ecological Adaptations.
- 1.5 Animal Associations - Mutualism, commensalism, parasitism, competition, predation, Symbiosis.

UNIT- II: Ecology-2

(15 Periods)

- 2.1 Concept of Species, Population dynamics-Natality, mortality, biotic potential, carrying capacity and Growth curves.
- 2.2 Community Structure and dynamics, Ecotone and edge effect and Ecological Succession.
- 2.3 Environmental Pollution — Sources, Effect and Control measures of Air, Water, Soil and Noise Pollution.
- 2.4 Acid rains, Green house effect and Ozone depletion.
- 2.5. Eutrophication in lakes, Biological Indicators.

UNIT - III: Zoogeography

(15 Periods)

- 3.1 Zoogeographical regions - Palaearctic, Nearctic, Neotropical, Oriental, Australian and Ethiopian regions - their Climatic and faunal peculiarities.
- 3.2 Wallace line, Discontinuous distribution
- 3.3 Continental Drift.
- 3.4 Biodiversity and hotspots of Biodiversity in India.
- 3.5 Wildlife conservation - National parks and Sanctuaries of India, Endangered species. RED data book, Principles of Conservation - *In situ and Ex situ*

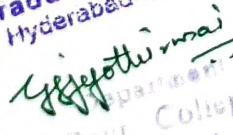
UNIT — IV: Evolution

(15 Periods)

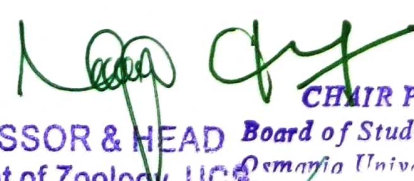
- 4.1 Theories of origin of life, Theories of evolution - Lamarckism and Neo-Lamarckism, Darwinism and Neo-Darwinism, Modern synthetic theory.
- 4.2 Patterns of Evolution, Evidences of Evolution. Causes and Role of Extinction in Evolution.
- 4.3 Forces of Evolution - mutation, gene flow, genetic drift, and natural selection. Hardy Weinberg Law.
- 4.4 Isolation – and isolating mechanisms
- 4.5 Speciation: Modes of speciation – Allopatric, Sympatric, Parapatric and Peripatric.



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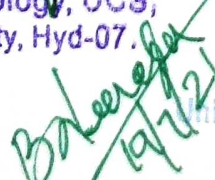
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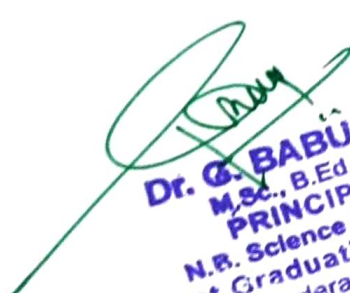
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Suggested Readings:


1. M.P.Arora, 'Ecology' Himalaya Publishing company.
2. P.D.Sharma, 'Environmental Biology'.
3. P.R.Trivedi and Gurdeep Raj, 'Environmental Ecology'
4. BuddhadevSarma and Tej Kumar, 'Indian Wildlife Threats and Preservation'
5. Chapman J.L. and Reiss M.J, 'Ecology Principles and Applications', Second Ed., Cambridge University Press, London.
7. Benny Joseph, 'Environmental Studies', TATA McGraw Hill Company, New Delhi.
8. Eugene P. Odum, 'Fundamentals of Ecology' Third Ed., Nataraj Publishers, Dehradun.
9. Veer BalaRastogi, "Ecology and Animal Distribution"
10. P.X. Gupta, "Text Book of Ecology and Environment"
11. Bhatnagar and Bansal, "Ecology and Wildlife biology"
12. Ridley, M. (2004). 'Evolution'. III Edition. Blackwell Publishing
13. Douglas, J. Futuyma (1997). 'Evolutionary Biology'. Sinauer Associates.
14. Minkoff, E. (1983). 'Evolutionary Biology'. Addison-Wesley.
15. Jan M. Savage. 'Evolution', 2nd ed, Oxford and IBH Publishing Co., New Delhi.



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B.Sc. ZOOLOGY SYLLABUS UNDER CBCS-2021-22

**B.Sc. ZOOLOGY-III YEAR PRACTICAL SYLLABUS SEMESTER- VI
PAPER-VI (DSE-II): ECOLOGY, ZOOGEOGRAPHY AND EVOLUTION**


Instructions: 3hr per week No. of credits: 1

1. Determination of pH of Soil and Water
2. Estimation of salinity (chlorides) of water in given samples.
3. Estimation of Carbonates and bicarbonates in the given water samples.
4. Estimation of dissolved oxygen of pond water, sewage water and effluents.
5. Identification of Zooplankton from a nearby water body.
6. Study of Pond Ecosystem / local polluted site - Report submission
7. Study of atleast 3 endangered or threatened wild animals of India through photographs / specimens / models
8. Field visit to Zoo Park to study the management, behavior and enumeration of wild animals.
9. Identification of Zoogeographical realms from the Map and identify specific fauna of respective regions.
10. Museum Study of Fossil animals: Peripatus, Coelacanth Fish, Dipnoi fishes, Sphenodon, Archeopteryx.
11. Study of homology and analogy from suitable specimens and pictures
12. Problems on Hardy-Weinberg Law
13. Macroevolution using Darwin finches (pictures)

Laboratory record work shall be submitted at the time of practical examination, Computer aided techniques should be adopted as per UGC guide lines.

Suggested manuals:


1. Robert Desharnais, Jeffrey Bell, 'Ecology Student Lab Manual, Biology Labs'
2. Darrell S Vodopich, 'Ecology Lab Manual'


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