গড়গাঁও মহাবিদ্যালয়
GARGAON COLLEGE

Course Distribution
Department of Zoology
2021-22

DEPARTMENT OF ZOOLOGY, GARGAON COLLEGE

COURSE DISTRIBUTION OF THE SYLLABUS (2021-2022)

Odd Semester (1st, 3rd, and 5th)

Ist Semester			
Faculty name	**Core course I**	**Core course II**	**Generic I**
Dr.Rina Handique	Unit 1: Protista, Parazoa and Metazoa		
	Practicals		
	1. Study of whole mount of *Euglena, Amoeba* and *Paramecium,* Binary fission and Conjugation in *Paramecium* 2. Examination of pond water collected from different places for diversity in Animal protista (Protozoa)		
Pimily Langthasa	Unit 2: Porifera Unit 3: Cnidaria Unit 4: Ctenophora Unit 5: Platyhelminthes	Unit 5: Applied Ecology	Unit 1. Protista Unit 2. Porifera Unit 3. Radiata Unit 4. Aceolomates Unit 5. Pseudo-coelomates
	Practicals		
	3. 3. Study of *Sycon* (T.S. and L.S.), *Hyalonema, Euplectella, Spongilla* *4.* 4. Identification of museum specimen: *Obelia, Physalia, Millepora, Aurelia, Tubipora, Corallium, Alcyonium, Gorgonia, Metridium, Pennatula, Fungia, Meandrina, Madrepora*and One specimen/slide of anyctenophore	2.Determination of population densityin a natural/hypothetical community by quadrate method and calculation of Shannon-Weiner diversity index for the same community. 4.Report on a visit to National Park/Biodiversity Park/Wild life sanctuary/Reserved forest.	1.Study of following specimens: **Non Chordates:** *Euglena, Noctiluca, Paramecium, Sycon, ,Physalia, Tubipora, Metridium, Taenia, Ascaris, Nereis, Aphrodite, Leech, Peripatus, Limulus, ,* Hermitcrab, *Daphnia,* Millipede, Centipede, Beetle, *Chiton, Dentalium, Octopus, Asterias, and Antedon.* **Chordates***: Balanoglossus, Amphioxus, Petromyzon, Pristis,*

			Hippocampus, Labeo, Icthyophis/Uraeotyphlus, Salamander, Rhacophorus Draco, Uromastix, Naja, Viper, model of Archaeopteryx, any three common birds- (*Crow, duck, Owl*), Squirrel and Bat.
Dr. Rashmi Dutta	Unit 6: Nemathelminthes	Unit 1: Introduction to Ecology Unit 2: Population Unit 3: Community Unit 4: Ecosystem	Unit 6. Coelomate Protostomes Unit 7. Arthropoda Unit 8. Mollusca Unit 9. Coelomate Deuterostomes Unit 10. Proto-chordata Unit 11. Pisces Unit 12. Amphibia Unit 12. Amphibia Unit 13. Amniotes Unit 14. Aves Unit 15. Mammalia
	Practicals		
	5. 5. Study of adult *Fasciola hepatica*, *Taenia solium*and their life cycles (Slides/micro- photographs) 6. 6. Study of adult *Ascaris lumbricoides* and its life stages(Slides/micro-photographs)	1. Study of life tables and plotting of survivorship curves of different types from the hypothetical/real data provided 3.Study of an aquatic ecosystem: Phytoplankton and zooplankton, Measurement of area, temperature, turbidity/penetration of light, determination of	2. Study of following Permanent Slides: Cross section of Sycon, Sea anemone and *Ascaris* (male and female). T. S. of Earthworm passing through pharynx, gizzard, and typhlosolar intestine. Bipinnaria and Pluteus larva. 3. Temporary mounts of: Septal & pharyngeal nephridia of earthworm. Unstained mounts of Placoid, cycloid and ctenoid scales. 4. Dissections of

			pH, and Dissolved Oxygen content (Winkler's method) and free CO_2. 4.Report on a visit to National Park/Biodiversity Park/Wild life sanctuary/Reserved forest.	Digestive and nervous system of Cockroach.
IIIrd Semester				
	Core course V	**Core Course VI**	**Core Course VII**	**Generic III**
Dr. Rina Handique	Unit 5: Pisces	Unit 6: Endocrine System		
	Identification: *Balanoglossus, Herdmania, Branchiostoma,* Colonial UrochordataSections of *Balanoglossus* through proboscis and branchiogenital regions, Sections of *Amphioxus* through pharyngeal, intestinal and caudal regions. Permanent slide of *Herdmania*spicules **i. Agnatha** *Petromyzon, Myxine* ***ii.*** **Fishes** *Scoliodon, Sphyrna, Pristis, Torpedo, Chimaera, Mystus, Heteropneustes, Labeo, Exocoetus,*	1.Recording of simple muscle twitch with electrical stimulation (or Virtual)		

	Echeneis, Anguilla, Hippocampus, Tetrodon/ Diodon, Anabas, Flat fish			
Pimily Langthasa	Unit10: Zoogeography	Unit 1: Tissues Unit 2: Bone and Cartilage Unit 3: Nervous System Unit 4: Muscle Unit 5: Reproductive System	Unit 3: Proteins Unit 4: Nucleic Acids	Unit 2: Functioning of Excitable Tissue (Nerve and Muscle) Unit 4: Renal Physiology Unit 6: Endocrine and Reproductive Physiology
	Practicals			
	i. **Amphibia** *Ichthyophis/Ureotyphlus, Necturus, Bufo, Hyla, Alytes, Salamandra* ***ii.*** **Reptilia** *Chelone, Trionyx, Hemidactylus, Varanus, Uromastix, Chamaeleon, Ophiosaurus, Draco, Bungarus, Vipera, Naja, Hydrophis, Zamenis, Crocodylus* Key for Identification of poisonous and non-poisonous snakes	2. Demonstration of the unconditioned reflex action (Deep tendon reflex such as knee jerk reflex). 3. Preparation of temporary mounts: Squamous epithelium, Striated muscle fibres and nerve cells	1. Qualitative tests of functional groups in carbohydrates, proteins and lipids 2. Paper chromatography of amino acids.	3. Estimation of haemoglobin using Sahli'shaemoglobinometer. 4. Study of permanent histological sections of mammalian oesophagus, stomach, duodenum, rectum, lung, kidney, thyroid, pancreas, adrenal, testis, ovary and nerve cells
Dr. Rashmi Dutta	Unit 1: Introduction to Chordates Unit 2: Proto-chordata Unit 3: Origin of Chordata Unit 4: Agnatha Unit 6: Amphibia		Unit 1: Carbo-hydrates Unit 2: Lipids Unit 5: Enzymes	Unit 1: Digestion and Absorption of Food Unit 3: Respiratory Physiology Unit 5: Cardio-vascular Physiology Unit 6: Endocrine and Reproductive Physiology

	Unit 7: Reptilia Unit 8: Aves Unit 9: Mammals			
		Study of permanent slides of Mammalian skin, Cartilage, Bone, Spinal cord, Nerve cell, Pituitary, Pancreas, Testis, Ovary, Adrenal, Thyroid and Parathyroid 5. Microtomy: Preparation of permanent slide of any five mammalian (Goat/white rat) tissues	3. Action of salivary amylase under optimum conditions. 4. Effect of pH, temperature and inhibitors on the action of salivary amylase. 5. Demonstration of proteins separation by SDS-PAGE (theoretically).	1. Preparation of temporary mount of Bloodfilm 2.Preparation of haemin and haemochromogencry stals
Vth Semester				
	Core course XI (Molecular Biology)	Core course XII (Principles of Genetics)	DSE-1 (Animal Behaviour)	DSE-2 (Animal Biotechnology)
Dr.Rina Handique				
Pimily Langthasa	Unit 1: Nucleic Acids Unit 2: DNA Replication Unit 3: Transcription Unit 4: Translation Unit 5: Post Transcriptional Modifications and Processing of Eukaryotic RNA Unit 6: Gene Regulation	Unit 4: Sex Determination	Unit 1: Introduction to Animal Behavior Unit 2: Patterns of Behaviour Unit 3: Social and Sexual Behaviour	Unit 1: Introduction Unit 2: Modern Techniques in Gene Manipulation Unit 3. Genetically Modified Organisms Unit 4. Culture Techniques and Applications
	Practicals			

	1. Study of Polytene chromosomes from Chironomous / Drosophila larvae. 2.Preparation of liquid culture medium (LB) and inoculation 3.Preparation of solid culture medium (LB) and growth of *E. coli* by spreading and streaking 5.Quantitative estimation of RNA using Orcinol reaction	5. Study of human karyotype (normal and abnormal) based on data.	3.To study geotaxis behaviour inearthworm. 4.To study the phototaxis behaviour in insectlarvae.	Genomic DNA isolation from *E.coli* Plasmid DNA isolation (pUC 18/19) from *E.coli* Restriction digestion of DNA. Construction of circular and linear restriction map from the data provided. Calculation of transformation efficiency from the dataprovided. Project report on animal cell culture
Dr. Rashmi Dutta	Unit 7: DNA Repair Mechanisms Unit 8: Regulatory RNAs	Unit 1: Mendelian Genetics and its Extension Unit 2: Linkage, Crossing Over and Chromosomal Mapping Unit 5: Extra-chromosomal Inheritance Unit 6: Polygenic Inheritance Unit 7: Recombination in Bacteria and Viruses Unit 8: Transposable Genetic Elements	Unit 4: Introduction to Chronobiology Unit 5: Biological Rhythm Unit 6: Biological Clocks	
	Practicals			
	4.Quantitative estimation of salmon sperm/calf thymus DNA using colorimeter (Diphenylamine reagent)	1.To study the Mendelian laws and gene interactions (based on theory) 2.Chi-square analyses using	1.To study nests and nesting habits of the birds and socialinsects. 2.To study the behavioural responses of	To study following techniques through photographs Southern blotting, PCR, DNA Fingerprinting

	6.Study and interpretation of electron micrographs/ photograph showing DNA Replication, Split genes and Transcription	seeds/beads/*Drosophila*. 3.Linkage maps based on data from conjugation, transformation and transduction. 4. Linkage maps based on data from *Drosophila* crosses. 6. Pedigree analysis of some human inherited traits.	wood lice to dry and humid conditions. 5.Visit to Forest/ Wild life Sanctuary/Biodiversity Park/Zoological Park to study behavioral activities of animals and prepare a short report. 6.Study of circadian functions in humans (daily eating, sleep and temperature patterns).	

EVEN SEMESTER (2ND, 4TH AND 6TH)

IInd Semester				
	Core course III		Core course IV	Generic II
Dr. Rashmi Dutta	Unit 1: Introduction to Coelomates Unit 2: Annelida Unit 3: Arthropoda Unit 4: Onychophora Unit 5: Mollusca Unit 6: Echinodermata			Unit 1: Introduction to Insects Unit II: Concept of Vectors Unit III: Insects as Vectors Unit IV: Dipteran as Disease Vectors Unit IV: Siphonaptera as Disease Vectors Unit V: Siphunculata as Disease Vectors Unit VI: Hempitera as Disease Vectors
PimilyLangthasa			Unit 1: Overview of Cells Unit 2: Plasma Membrane Unit 3: Endomembrane System Unit 4: Mitochondria and Peroxisomes Unit 5: Cytoskeleton Unit 6: Nucleus Unit 7: Cell Division Unit 8: Cell Signaling	
IVth Semester				
	Core course VIII	Core Course IX	Core Course X	Generic IV

Dr. Rina Handique		Unit 5: Physiology of Heart		
PimilyLangthasa		Unit 2: Physiology of Respiration Unit 3: Renal Physiology	Unit 4: Protein Metabolism Unit 5: Oxidative Phosphorylation	Unit 1: Introduction Unit II Climate Change Unit III Pollution
Dr. Rashmi Dutta	Unit1:Integumentary System Unit 2: Skeletal System Unit 3: Digestive System Unit 4: Respiratory System Unit 5: Circulatory System Unit 6: Urinogenital System Unit 7: Nervous System Unit 8: Sense Organs	Unit 1: Physiology of Digestion Unit 4: Blood	Unit 1: Overview of Metabolism Unit2: Carbohydrate Metabolism Unit 3: Lipid Metabolism	Unit IV Waste Management Technologies Unit 5 Diseases
VI Semester				
	Core course XIII	Core Course XIV	DSE-7	DSE-8
Dr. Rina Handique			Unit 4: Aquaculture	
PimilyLangthasa	Unit 1: Introduction Unit 2: Early Embryonic Development Unit 3: Late Embryonic Development Unit 4: Post Embryonic Development	Unit 1: Unit 2 Unit 3 Unit 4 Unit 5		Unit 1: Overview of Immune System Unit 2: Innate and Adaptive Immunity
Dr. Rashmi Dutta	Unit 5: Implications of Developmental Biology	Unit 6 Unit 7 Unit 8 Unit 9	Unit 1: Introduction and Classification Unit 2: Morphology and Physiology	Unit 3: Antigens Unit 4: ImmunoglobulinsUnit 5: Major Histocompatibility Complex

			Unit 3: Fisheries Unit 5: Fish in research	Unit 6: Cytokines Unit 7: Complement System Unit 8: Vaccines

HIGHER SECONDARY (2021-2022)

Teacher's name	Units
PimilyLangthasa	**Unit-VI: Reproduction:**
	3:Human reproduction: (i) The Male Reproductive System; (ii) The Female Reproductive System; (iii) Gametogenesis; (iv) Menstrual Cycle; (v) Fertilization and Implantation; (vi) Pregnancy and Embryonic Development; (vii) Parturition and Lactation. 4: Reproductive Health: (i) Reproductive Health-Problems and Strategies; (ii) Population Explosion and Birth Control; (iii) Medical Termination of Pregnancy; (iv) Sexually Transmitted Diseases; (v) Infertility.
	Unit-VII: Genetics and Evolution
	Chapter 5: Principles of Inheritance and Variation: (i) Mendel's Laws of Inheritance; (ii) Inheritance of One Gene; (iii) Inheritance of Two Genes; (iv) Sex Determination; (v) Mutation; (vi) Genetic Disorders.
Dr. Rashmi Dutta	**Unit-VIII: Biology in Human Welfare**
	7: Evolution: (i) Origin of Life; (ii) Evolution of Life Forms- A Theory; (iii) Evidences for Evolution; (iv) Adaptive Radiation; (v) Biological Evolution; (vi) Mechanism of Evolution; (vii) HardyWeinberg Principle; (viii) A Brief account of Evolution; (ix) Origin and Evolution of Man Chapter 8: Human Health and Diseases: (i) Common Diseases in Humans; (ii) Immunity; (iii) AIDS; (vi) Cancer; (v) Drugs and Alcohol Abuse.
	9: Strategies for Enhancement in Food Production : (i) Animal Husbandry; (ii) Plant Breeding; (iii) Single Cell Protein; (iv) Tissue Culture
	10: Microbes in Human Welfare: (i) Microbes in Household Products; (ii) Microbes in Industrial Products; (iii) Microbes in Sewage Treatment; (iv) Microbes in Production of Biogas; (v) Microbes as Biocontrol Agents; (vi) Microbes as Biofertilisers
PimilyLangthasa	**Unit-IX: Biotechnology**
	Chapter 11: Biotechnology; Principles and Processes: (i) Principles of Biotechnology; (ii) Tools of recombinant DNA Technology; (iii) Processes of Recombinant DNA Technology. 12: Biotechnology and its Application: (i) Biotechnological Applications in Agriculture; (ii) Biotechnological Applications in Medicine; (iii) Transgenic Animals; (iv) Ethical Issues.

Dr. Rashmi Dutta	**Unit-X: Ecology**
	Chapter 13: Organisms and Populations: (i) Organism and its Environment; (ii) Populations. 14: Ecosystems: (i) Ecosystem- Structure and Function; (ii) Productivity; (iii) Decomposition; (iv) Energy Flow; (v) Ecological Pyramids; (vi) Ecological Succession; (vii) Nutrient Cycling; (viii) Ecosystem Services. 15: Biodiversity and Conservation: (i) Biodiversity; (ii) Biodiversity Conservation; (iii) National Park and Sanctuaries of Assam with special reference to conservation of endangered species. 16: Bioresources of Assam: (i) Medicinal and Timber Yielding Plants; (ii) Sericogenic Resources (Muga and Eri) 17: Environmental Issues: (i) Air Pollution and its Control; (ii) Water Pollution and its Control; (iii) Solid Wastes; (iv) Agro-chemicals and their effects; (v) Radioactive Wastes; (vi) Greenhouse Effect and Global Warming; (vii) Ozone Depletion in the Stratosphere; (viii) Degradation by Improper Resource Utilization and Maintenance; (ix) Deforestation.