

TEACHING PLAN for NON CBCS (Year 2018-19)

Department of Zoology

SBMS COLLEGE, SUALKUCHI

Teaching technique:

- The classroom transaction of all the papers will be done through lectures, assignments, group discussion, practical demonstration, projects, etc.
- To make the teaching learning process more interactive and interesting ICT enabled classes will also be taken.
- Practical experiments will be done in departmental laboratories under guidance of respective teacher. Necessary instruction will be followed. To develop an understanding quality few experiments will be incorporated outside the laboratory (within college campus)
- To gain practical knowledge, field study, educational excursion, institutional visit etc. will also be planned according to demand of course content.
- At least two class tests will be conducted per semester among the major students.
- For knowledge upliftment, observation of Days of importance, poster presentation competition, photography (Zoology related) competition will also be organized time to time.
- Invited lecture/ popular talk/ workshop/ departmental seminars etc. will also be arranged for boosting the knowledge/ ideas among the students.

NB:

- Sessional Examinations are conducted by the College Examination Cell in the middle part of each semester.
- End Semester Examinations are generally held in Nov- Dec and May- Jun.
- Summer Vacation (generally starts from 1st Jul to 31st Jul)
- Winter Break (generally starts from 1st Jan to 19th Jan)

Odd Semester

Semester	TDC I Semester	Course	Major
Credit	06	Marks:	60+15=75
Paper Name	Biosystematics and Taxonomy	Paper No:	M-101

Unit	Course Content	Allotted to	Hours	Month	Remarks
1	• Definition, basic concept and importance of systematics and taxonomy	Dr Kakali Talukdar	02	Aug	
2	• Concepts of different conventional and newer aspects of biosystematics- a) chemotaxonomy, b) cytotoxonomy, c) molecular taxonomy		04	Aug	
3	• Taxonomic procedures- taxonomic collection, preservation, methods of identification, taxonomic keys- different types of keys	Dr Sikha Rani Kalita	07	Aug	
4	• Concepts of taxonomic terms	Dr Kakali Talukdar	01	Aug	
5	• Importance of classification		01	Aug	
6	• Theories of biological classification: essentialism, nominalism, empiricism, cladism and evolutionary classification, their merits and demerits		03	Sep	
7	• Concept of species	Dr Sikha Rani Kalita	03	Aug	
8	• Process of typification and different zoological types		03	Aug	
9	• International Code of Zoological Nomenclature (ICZN): Basic Concepts	Bandana Deka	05	Aug	
10	• Binomial Nomenclature and Trinomial Nomenclature		04	Aug	

Semester	TDC I Semester	Course	Major
Credit	06	Marks:	60+15=75
Paper Name	Animal Diversity- I (Non-Chordates)	Paper No:	M-102

Unit	Course Content	Allotted to	Hours	Month	Remarks
1	• Classification of Animal kingdom major and minor phyla	Dr Sikha Rani Kalita	02	Sep	
2	• Protozoa: General Characters and classification upto orders with examples. • Nutrition, locomotion and reproduction in protozoa		07	Sep	
3	• Porifera: General Characters and classification upto orders with examples. • Canal system in Porifera		04	Oct, Nov	
4	• Coelenterata: General Characters and classification upto orders with examples. • Polymorphism in siphonophore, • Coral and coral reef formation		07	Nov, Dec	
5	• Platyhelminthes: General Characters and classification upto orders with examples. • Morphology and life history of Fasciola	Dr Kakali Talukdar	02	Sep	
6	• Aschelminthes: General Characters and classification upto orders with examples. • Morphology and life history of Ascaris. • Life cycle and pathogenicity of parasites of man (Plasmodium, taenia, Ancylostoma, Wuchereria), Parasitic adaptation in helminthes.		04	Sep	
7	• Annelida: General Characters and classification upto orders with examples. • Coelom, coelomoduct and nephridia of Annelida, • Structure and significance of trochophore larva		04	Oct	
8	• ARTHROPODA: General Characters and classification		10	Aug,	

	upto orders with examples. • Appendages and digestive system of Prawn. • Significance of <i>Peripatus</i> in evolution	Bandana Deka		Sep	
9	• MOLLUSCA: General Characters and classification upto orders with examples. • Digestive and Nervous System of Pila. Torsion in Gastropoda		09	Sep, Oct	
10	• ECHINODERMATA: General Characters and classification upto orders with examples. • Water Vascular System in Echinodermata. • Larvae of Echinodermata.		10	Oct, Nov & Dec	

Semester	TDC I Semester	Course	Major
Credit	04	Marks:	40+10=50
Paper Name	Practical	Paper No:	M-103

Unit	Course Content	Allotted to	Hours	Month	Remarks
1	• Dissection- Nervous system and reproductive system of Cockroach	Dr Kakali Talukdar	04	Nov	
2	• Slide preparation- Temporary	Dr Sikha Rani Kalita	04	Dec	
3.1	• Slide preparation- Permanent		02	Dec	
3.2	• Identification of prepared slide	Dr Kakali Talukdar	02	Nov	
4	• Study of Museum Specimen	Bandana Deka	12	Sep, Oct	

Semester	TDC I Semester	Course	General
Credit	06	Marks:	60+15=75
Paper Name	Biosystematics, Taxonomy, wildlife Conservation and Management	Paper No:	E-101

Unit	Course Content	Allotted to	Hours	Month	Remarks
1	• Definition, basic concept and importance of systematics and taxonomy	Dr Sikha Rani Kalita	02	Aug	
2	• History of systematics	Dr Kakali Talukdar	01	Aug	
3	• Importance and application of systematics in biology		02	Aug	
4	• Trends in biosystematics-Concepts of different conventional and newer aspects of biosystematics- • a) chemotaxonomy, b) cytotaxonomy, c) molecular taxonomy		07	Aug, Sep	
5	• Taxonomic procedures- taxonomic collection, preservation, methods of identification,	Dr Sikha Rani Kalita	04	Aug Sep	
6	• Taxonomic keys- different types of keys		02	Sep	
7	• Concepts of taxonomic terms	Dr Kakali Talukdar	02	Oct, Nov	
8	• Systems of classification		02	Nov, Dec	
9	• International Code of Zoological Nomenclature (ICZN): Basic Concepts	Bandana Deka	02	Aug	
10	• Binomial Nomenclature and Trinomial Nomenclature		02	Sep	
2.1	• Definition of wild life- Wild life Act.1972.	Dr Sikha Rani Kalita	02	Oct	
2.2	• Principles of wild life conservation and management.		02	Nov	
2.3	• Wild life sanctuaries and National Parks of N.E. Region with special reference to Kaziranga National Park and Manas National Park.	Bandana Deka	02	Oct	
2.4	• Conservation of Wildlife and importance of biodiversity		02	Nov	

Semester	TDC III Semester	Course	Major
Credit	06	Marks:	60+15=75
Paper Name	Comparative Anatomy and Histology	Paper No:	M-301

Unit	Course Content	Allotted to	Hours	Month	Remarks
1.1	• Integument and its derivatives in vertebrates	Bandana Deka	05	Aug	
1.2	• Comparative anatomy of heart, Aortic arches and succession of kidney in vertebrates		10	Aug	
1.3	• Organs of hearing and balancing in vertebrates		06	Sep	
1.4	• Comparative anatomy of thyroid		05	Sep	
1.5	• Comparative anatomy of respiratory system in vertebrates		7	Oct	
1.6	• Comparative anatomy of brain in vertebrates		7	Nov	
2.1	• Differentiation and organization of cells and maintenance of tissues.	Dr Sikha Rani Kalita	02	Aug	
2.2	• Animal tissues—Types, structure and their functions: Epithelial, Muscular, Connective tissues (cartilage, bone, blood, lymph, areolar, adipose, reticular) and Nervous tissue.		15	Aug, Sep	
2.3	• Basic principles of fixation and staining.		02	Oct	
2.4	• Classification, Composition and Properties of dye.		02	Oct	
2.5	• Use of mordants and metachromatic dyes.		02	Nov	
2.6	• Principle and procedure of histological staining of carbohydrates, amino acids, proteins, lipids and nucleic acids.		03	Nov	

Semester	TDC III Semester	Course	Major
Credit	06	Marks:	60+15=75
Paper Name	Cell Biology	Paper No:	M-302

Unit	Course Content	Allotted to	Hours	Month	Remarks
1	• Diversity of cell size and shape	Dr Kakali Talukdar	01	Aug	
2	• Cell theory		01	Aug	
3	• Structure of prokaryotic and eukaryotic cell		01	Aug	
4	• Physical and chemical properties of protoplasm		02	Aug	
5	• Structure of plasma membrane, its modifications and function		03	Aug	
6	• Chromosome -Structure and function		02	Aug	
7	• Cell division- cell division cycles, Mechanism of cell cycle. • Membrane transport of small molecules and ionic basis of membrane excitability, Intracellular organisation of the cell. • Ultra structure and function of mitochondria, Golgi bodies, Endoplasmic reticulum, ribosome, Lysosome, exo and endocytosis		10	Aug, Sep	
8	• Cellular energy transaction- role of mitochondria and Chloroplast		03	Sep	
9	• Cytoskeleton: structure and function of centriole, microtubule and microfilaments- structure and dynamics. Mitotic apparatus and chromosome movement		03	Sep	
10	• Cilia and flagella- Structure and function		02	Sep	

Semester	TDC III Semester	Course	Major
Credit	04	Marks:	40+10=50
Paper Name	Practical	Paper No:	M-303

Unit	Course Content	Allotted to	Hours	Month	Remarks
1	• Study of different types of cells (prokaryotic and eukaryotic)	Bandana Deka	04	Aug	
2	• Staining techniques of nucleus and nucleolus	Dr Kakali Talukdar	02	Oct	
3	• Preparation of physiological solution- buffers, fixatives, stains,		04	Oct	
4	• Preparation of histological slides from tissues as liver, lung, stomach, intestine, kidney, pancreas, testis and ovary		08	Nov	
5	• Study of different tissue through Permanent slides	Bandana Deka & Dr Sikha Rani Kalita	04 + 08	Sep	

Semester	TDC III Semester	Course	General
Credit	04	Marks:	40+10=50
Paper Name	Animal Diversity-I (NON-CHORDATES)	Paper No:	E-301

Unit	Course Content	Allotted to	Hours	Month	Remarks
1	• Introduction to Animal kingdom	Dr Sikha Rani Kalita	01		
2	• Protozoa: General Characters and classification upto orders with examples. • Structure, Nutrition, locomotion and reproduction of <i>Paramecium</i>		06	Aug	
3	• Porifera: General Characters and classification upto orders		04	Aug	

	with examples. • Anatomical structure and function with special reference to Canal system in <i>Sycon</i>				
4	• Coelenterata: General Characters and classification upto orders with examples. • Anatomical structure and function of <i>Obelia</i>		03	Sep	
5	• Platyhelminthes: General Characters and classification upto orders with examples. • Structure and life history of Fasciola	Dr Kakali Talukdar	03	Aug	
6	• Aschelminthes: General Characters and classification upto orders with examples. • Anatomical structure and life history of Ascaris.		03	Aug	
7	• Annelida: General Characters and classification upto orders with examples. • Anatomical structure and function of <i>Leech</i>		03	Sep	
8	• ARTHROPODA: General Characters and classification upto orders with examples. • Anatomical structure and appendages of prawn • Mouth parts, life history of mosquito and housefly and their roles as vector	Bandana Deka	06	Aug	
9	• MOLLUSCA: General Characters and classification upto orders with examples. • Anatomical structure and function of pila		04	Sep	
10	• ECHINODERMATA: General Characters and classification upto orders with examples. • Anatomical structure and function of starfish with special reference to Water Vascular System.		04	Oct, Nov	

Semester	TDC III Semester	Course	General
Credit	04	Marks:	40+10=50
Paper Name	Practical	Paper No:	E-302

Unit	Course Content	Allotted to	Hours	Month	Remarks
1	Dissection- • Nervous system and Digestive system of cockroach	Dr Kakali Talukdar	04	Sep	
	• Urinogenital system of leech	Bandana Deka	02	Oct	
	• Digestive system of Pila	Dr Sikha Rani Kalita	02	Oct	
2	• Slide preparation- Temporary	Dr Kakali Talukdar Dr Sikha Rani Kalita	02+02	Oct	
3	• Slide preparation- Permanent	Dr Sikha Rani Kalita	04	Nov	
4	• Identification of prepared slide	Dr Kakali Talukdar	04	Nov	
5	• Study of Museum Specimen	Bandana Deka	08	Aug, Sep	

Semester	TDC V Semester	Course	Major
Credit	06	Marks:	60+15=75
Paper Name	Animal Physiology	Paper No:	M-501

Unit	Course Content	Allotted to	Hours	Month	Remarks
1	• Nutrition: Nutritional requirements, Digestion and absorption of dietary components (Carbohydrates, fats, proteins, vitamins, and minerals), Co-ordination and control of digestive activity (nervous and hormonal regulation)	Dr Kakali Talukdar	03	Aug	
2	• Respiration: Types of respiration-anaerobic and aerobic, Properties and function of respiratory pigments, Exchange of gases, Breathing, O ₂ dissociation curve, control of breathing		08	Aug	

3	• Body fluids: Type of body fluids, composition and function of different body fluids, haemopoiesis, Buffer system in blood, chloride shift, blood group and transfusion, Blood clotting mechanism	Bandana Deka	09	Aug	
4	• Heart and circulation: Types of heart-myogenic and neurogenic, origin, conduction and regulation of heart beat, cardiac cycle, blood pressure		07	Aug, Sep	
5	• Excretion: Types of nitrogenous wastes- ammonotelic, ureotelic and uricotelic. Physiology of urine formation. Regulation of urine formation	Dr Sikha Rani Kalita	05	Aug	
6	• Nerve physiology: Initiation and conduction of nerve impulse, Synapse and synaptic transmission through myelinated and non- myelinated nerve fibre, Neuromuscular co-ordination		05	Aug	
7	• Muscle protein, chemistry of muscle contraction		02	Aug	
8	• Osmoregulation in vertebrates		02	Aug	

Semester	TDC V Semester	Course	Major
Credit	06	Marks:	60+15=75
Paper Name	Biochemistry and bioenergetics	Paper No:	M-502

Unit	Course Content	Allotted to	Hours	Month	Remarks
1.1	• Chemical foundation of biology- pH, pK, acids, bases, buffers free energy, isomerisation	Dr Kakali Talukdar	03	Aug	
1.2	• Classification and biological significance of carbohydrate, protein and lipid		03	Aug	
1.3	• Assembly of macromolecular complexes, ribosome chromatin and plasma membrane		03	Aug	
1.4	• Enzymes nature and classification- Mechanism of	Dr Sikha Rani Kalita	02	Aug	

	enzyme action • Enzyme kinetics				
1.5	• Ornithine cycle		01	Aug	
1.6	• Oxidation and biosynthesis of fatty acids	Bandana Deka	04	Sep	
2.1	• First and second laws of thermodynamics	Dr Kakali Talukdar	02	Aug	
2.2	• Oxidation- reduction potential with special reference to mitochondrial electron transport system. • ATP in metabolism and in free energy production		03	Aug	
2.3	• Theories of oxidative phosphorylation		03	Aug	

Semester	TDC V Semester	Course	Major
Credit	06	Marks:	60+15=75
Paper Name	Endocrinology and Immunology	Paper No:	M-503

Unit	Course Content	Allotted to	Hours	Month	Remarks
1.1	• Brief account of structural features, historical structure and function of endocrine glands-Pituitary, Thyroid, Pancreas, Adrenal and Gonads	Bandana Deka	06	Sep	
1.2	• Hypothalamo-hypophysial axis		02	Sep	
1.3	• Classification of hormone		03	Sep	
1.4	• Mechanism of hormone action		03	Oct	
1.5	• Synthesis of thyroxin		02	Oct	
1.6	• Pancreatic hormones and metabolic regulation, physiological action of insulin and glucagon		03	Oct	
1.7	• Hormonal control of calcium homeostasis, chemistry and control of secretion of parathormone	Dr Sikha Rani Kalita	02	Sep	
2.1	• Basic immunological concept		01	Sep	
2.2	• Innate and acquired immunity		02	Sep	

2.3	• Components of immune system	Dr Kakali Talukdar	01	Sep	
2.4	• Cell mediated and humoral immune system		01	Sep	
2.5	• Structure and function of antibodies		03	Aug	
2.6	• Antigen antibody interaction		02	Sep	
2.7	• Immunization		02	Sep	
2.8	• Hyper immunity (allergy, immune deficiency, autoimmunity, Basic concept)		02	Sep	

Semester	TDC V Semester	Course	Major
Credit	06	Marks:	60+15=75
Paper Name	Biological techniques and Biostatistics	Paper No:	M-504

Unit	Course Content	Allotted to	Hours	Month	Remarks
1.1	• Principle and uses of analytical instruments: pH meter, colorimeter, spectrophotometer, ultra centrifuge	Dr Kakali Talukdar	03	Sep	
1.2	• Microscopy- Working principle of light, electron phase contrast and fluorescence microscopy		03	Sep	
1.3	• Separation techniques in biology- elementary knowledge of chromatography and electrophoresis		02	Oct	
1.4	• Microtomy		02	Oct	
1.5	• Cryopreservation of eggs and sperms		01	Nov	
1.6	• Use of radioisotope in biology, Autoradiography		01	Nov	
2.1	• Statistics in Biology	Dr Sikha Rani Kalita	02	Sep	
2.2	• Sampling techniques-sample units and their selection		01	Sep	
2.3	• Correlation and regression analysis- linear		01	Sep	
2.4	• Analysis of variene, t-test		03	Oct	
2.5	• Chi Square test (XY)		02	Oct	

2.6	• Use of computers in biology, computer application- data processing, language		05	Nov	
2.7	• Utility of biostatistics	Bandana Deka	01	Nov	
2.8	• Mean-Arithmetic, Geometric and Harmonic mean. Median and Mode		03	Nov	
2.9	• Standard deviation, standard error of mean		02	Nov	
2.10	• Graphic representation of data- histogram, bar diagram, Pie diagram and O-give		01	Nov	

Semester	TDC V Semester	Course	Major
Credit	04	Marks:	40+10=50
Paper Name	Physiology (Practical)	Paper No:	M-505

Unit	Course Content	Allotted to	Hours	Month	Remarks
1	• Demonstration of Osmosis	Dr Sikha Rani Kalita	02	Aug	
2	• Effect of isotonic, hypertonic and hypotonic solution, acid and alkali on RBC		02	Sep	
3	• Haemoglobin estimation	Bandana Deka	02	Oct	
4	• Human blood grouping, ABO and Rh factor		02	Sep	
5	• Total count of RBC and WBC		06	Sep	
6	• Differential count of WBC		02	Sep	
7	• Preparation of haemin crystal from blood		02	Oct	
8	• Study of cardiac cycle in frog/rat using Kymograph	Dr Sikha Rani Kalita	02	Sep	
9	• Normal and abnormal constituents of urine (glucose and albumin)	Dr Kakali Talukdar	02	Sep	

Semester	TDC V Semester	Course	Major
Credit	04	Marks:	40+10=50
Paper Name	Biochemistry and Endocrinology (Practical)	Paper No:	M-506

Unit	Course Content	Allotted to	Hours	Month	Remarks
1.1	• Biochemical estimation of glucose, total soluble proteins and total lipids.	Dr Kakali Talukdar	02	Sep	
1.2.	• Detection of enzyme activity-salivary amylase, pepsin		02	Oct	
1.3	• Separation of amino acids by paper/thin layer chromatography	Bandana Deka	06	Nov	
1.4	• Estimation of ascorbic acid in lemon	Dr Kakali Talukdar	02	Nov	
1.5	• Detection of presence of vitamin A		02	Nov	
1.6	• Detection of mono, di, and polysaccharides		02	Nov	
2.1	• Dissection and localisation of selected endocrine glands: thyroid, pituitary, pancreas, adrenal, testis, ovary in frog/rat/rabbit	Dr Sikha Rani Kalita	10	Oct, Nov	
2.2	• Histological study of endocrine glands: thyroid, pancreas, adrenal, testis, ovary (through prepared slides)		04	Nov	

Semester	TDC V Semester	Course	General
Credit	08	Marks:	80+20=100
Paper Name	Cell biology, Genetics and Developmental Biology	Paper No:	E-501

Unit	Course Content	Allotted to	Hours	Month	Remarks
1.1	• Structure of prokaryotic and eukaryotic cell		01	Aug	
1.2	• Virus- structure and assembly		01	Aug	

1.3	• Cell Theory	Dr Kakali Talukdar	01	Aug	
1.4	• Structure and function of plasma membrane, Membrane transport		03	Aug	
1.5	• Cell reproduction and mitosis		03	Sep	
1.6	• Ultra structure and function of mitochondria, Golgi bodies, Endoplasmic reticulum, and ribosome,		03	Sep	
1.7	• Chromosome -Ultrastructure and organization, Giant Chromosomes- Types and significance		02	Sep	
2.1	• Linkage- its mechanism and significance	Dr Sikha Rani Kalita	01	Aug	
2.2	• Crossing over- its types, mechanism, and significance		02	Aug	
2.3	• Sex linkage, Sex linked inheritance		02	Aug	
2.4	• Chromosomal sex determination		01	Aug	
2.5	• Varieties of gene expression-multiple alleles, lethal genes, pleotropic genes, epistasis		03	Sep	
2.6	• Mutation- a) Chromosomal aberration b) Gene mutation, c) Harmful and beneficial effects of mutation		04	Oct, Nov	
3.1	• Gametogenesis: Spermatogenesis, Oogenesis,	Bandana Deka	02	Aug	
3.2	• Fertilization: Sperm-egg interaction, activation of egg, Gaete fusion in Sea urchin		03	Aug	
3.3	• Types of animal eggs.		01	Aug	
3.4	• Concept of Organizer and Induction		02	Sep	
3.5	• Extra embryonic membranes in bird and mammal.		02	Oct	
3.6	• Reproductive cycles in vertebrates		01	Oct	
3.7	• Regeneration in vertebrates and invertebrates		02	Nov	
3.8	• Parthenogenesis.		01	Nov	

Semester	TDC V Semester	Course	General
Credit	08	Marks:	80+20=100
Paper Name	Cell biology, Genetics and Developmental Biology (Practical)	Paper No:	E-502

Unit	Course Content	Allotted to	Hours	Month	Remarks
1	• Study of different types of cells (prokaryotic and eukaryotic)	Bandana Deka	04	Aug	
2	• Staining techniques of nucleus and neucleolus	Dr Kakali Talukdar	02	Aug	
3	• Study of mitosis in onion root tip/tadpole larve		02	Sep	
4	• Study of meosis in Grasshopper/ <i>Grylotalpa</i>		02	Sep	
5	• Study of different tissue through Permanent slides	Dr Sikha Rani Kalita	04	Oct	
6	• Staining of Barr body from buccal epithelium		02	Nov	
7	• Study of slides of blastula, gastrula, and morula of Amphioxus and Frog/Toad	Bandana Deka	02	Sep	
8	• Study of specific stages of development of chick embryo through prepared slides		02	Oct	

Even Semester

Course content

Semester	TDC II Semester	Course	Major
Credit	06	Marks:	60+15=75
Paper Name	Animal Diversity- II (Chordates)	Paper No:	M-201

Unit	Course Content	Allotted to	Hours	Month	Remarks
1	•PROTOCHORDATES: General characters, classification of protochordates up to suborder with examples.	Dr Kakali Talukdar	01	Feb	
2	•HEMICHORDATA: Morphology and affinity of <i>Balanoglossus</i> .		01	Feb	
3	•UROCHORDATA: Structure and retrogressive metamorphosis of Urochordata.		01	Mar	
4	•CEPHALOCHORDATA: Structure and affinities if <i>Amphioxus</i> .		01	Mar	
5	•AGNATHOSTOMATA: Distinctive characters and classification, Amocoete larva-- its importance in evolution, Differences between Lampry Hagfish.		03	Mar	
6	•PISCES: General characters, classification up to order with examples. Circulatory system, Nervous System and Sense organ of Scoliodon. Accessary respiratory organ and swim bladder in fish. Migration of fishes.	Dr Sikha Rani Kalita	11	Feb	
7	•AMPHIBIA: General characters, classification up to order with examples. Respiration in Amphibia, Parental care in Amphibia.		06	Mar	
8	•REPTILIA: General characters, classification up to order with examples. Anatomical peculiarites and affinities of <i>Sphenodon</i> . Biting mechanism of poisonous snake		06	Mar	

9	•AVES: Distinctive characters, classification up to order with examples. Air sacs- significance and importance, Flight and perching mechanisms in birds, Migration of bird.	Bandana Deka	06	Feb	
10	•MAMMALIA: Distinctive characters, classification up to order with examples. General organization and affinities Monotremata and Marsupialia. Receptor and sense organs in Mammals. Dentition in Mammals		07	Feb	

Semester	TDC II Semester	Course	Major
Credit	06	Marks:	60+15=75
Paper Name	Ecology, Wild life Conservation and Management	Paper No:	M-202

Unit	Course Content	Allotted to	Hours	Month	Remarks
1.1	•Definition, Aim and scope of Ecology.	Dr Kakali Talukdar	01	Mar	
1.2	•Ecological niche, habitat, biosphere, biome and ecotone.		01	Mar	
1.3	•Ecosystem—Types: Aquatic and Terrestrial, Food chain and ecosystem energetics.		03	Apr	
1.4	•Biotic factors		01	Apr	
1.5	•Biogeochemical cycles—Nitrogen and Phosphorus.		01	Apr	
1.6	•Pollution—Air, water, soil and noise.		03	Apr	
2.1	•Definition of wild life- Wild life Act.1972.	Dr Sikha Rani Kalita	02	Mar	
2.2	•Principles of wild life conservation and management.		02	Apr	
2.3	•Wild life sanctuaries and National Parks of N.E. Region with special reference to Kaziranga National Park and Manas National Park.		03	Apr	
2.4	•Conservation strategies of endangered species.		02	Apr	

2.5	•IUCN Red list categories. Endangered mammalian species of NE India.		02	Apr	
2.6	•Concept of Biosphere Reserve programmes	Bandana Deka	02	Mar	
2.7	•Ethology of Pigmy Hog and Golden langur		04	Apr	
2.8	•Carrying capacity and its impact on wildlife population		03	Apr	
2.9	•Protective behaviour family ties in primates.		03	Apr	

Semester	TDC II Semester	Course	Major
Credit	04	Marks:	40+10=50
Paper Name	Practical	Paper No:	M-203

Unit	Course Content	Allotted to	Hours	Month	Remarks
1	• Dissection- Afferent and efferent branchial system, Internal ear and IX th and X th cranial nerves of Scoliodon	Bandana Deka	04	Apr	
2	• Slide preparation- Temporary	Dr Kakali Talukdar	02	Feb	
3	• Slide preparation- Permanent	Dr Sikha Rani Kalita	04	Feb	
4	• Study of Bones	Dr Sikha Rani Kalita	02	Mar	
5	• Study of Museum Specimen	Bandana Deka	08	Mar	
6	• Estimation of dissolved O ₂ in water	Dr Kakali Talukdar	04	Mar	
7	• Estimation of free CO ₂ in water		04	Apr	
8	• Measurement of temperature, pH of water sample (by meter/ Lovibund disc comparator)	Dr Sikha Rani Kalita	02	Apr	
9	• Relative humidity by wet and dry bulb thermometer		02	Apr	

Semester	TDC II Semester	Course	General
Credit	06	Marks:	60+15=75
Paper Name	Ecology, Evolution and Adaptation	Paper No:	E-201

Unit	Course Content	Allotted to	Hours	Month	Remarks
1.1	• Definition, Aim and scope of Ecology.	Dr Kakali Talukdar	02	Feb	
1.2	• Subdivision of Ecology- a) Autecology b) Synecology		02	Feb	
1.3	• Ecosystem—concept, and ecosystem energetics.		02	Mar	
1.4	• Ecological succession		02	Mar	
1.5	• Pollution—Air, water, soil and noise.		02	Apr	
2.1	• Concept of Evolution, micro, and macro evolution	Dr Sikha Rani Kalita	03	Feb	
2.2	• Origin of life-Spontaneous generation, formation of organic compound, sources of energy and food		03	Feb, Mar	
2.3	• Evidences of organic evolution: Embryological, paleontological and biochemical evidences		04	Mar	
2.4	• Darwinism and Neo-Darwinism		01	Apr	
2.5	• Lamarckism and Neo Lamarckism		01	Apr	
2.6	• Evolution of Man		02	Apr	
3.1	• Principles of adaptation	Bandana Deka	01	Feb	
3.2	• Types of adaptation-		02	Feb	
3.3	• Aquatic, and Volant adaptation		03	Mar	
3.4	• Cryptic and warning coloration, Mimicry.		03	Apr	

Semester	TDC IV Semester	Course	Major
Credit	06	Marks:	60+15=75
Paper Name	Developmental Biology	Paper No:	M-401

Unit	Course Content	Allotted to	Hours	Month	Remarks
1	• Developmental biology- aim and scope	Dr Sikha Rani Kalita	02	Feb	
2	• Gametogenesis: Spermatogenesis, Oogenesis, Vitellogenesis, egg membrane.		03	Feb	
3	• Fertilization: Sperm-egg interaction, biochemical events, post- fertilizations events.		02	Feb	
4	• Parthenogenesis- Natural haploid, diploid and cyclic parthenogenesis. Artificial stimulus for parthenogenesis and its significance.		02	Mar	
5	• Types of animal eggs.		02	Mar	
6	• Cellular dynamics in development		02	Mar	
7	• Organizer and Induction	Bandana Deka	04	Feb	
8	• Fate map construction in frog and chick.		06	Feb	
9	• Organogenesis: Development of heart and eye in vertebrates.		08	Mar	
10	• Development of chick embryo up to three germ layer formation.		06	Mar, Apr	
11	• Extra embryonic membranes in bird and mammal.		07	Apr, May	
12	• Placenta- different types, function and physiology.		04	May	

Semester	TDC IV Semester	Course	Major
Credit	06	Marks:	60+15=75
Paper Name	Genetics	Paper No:	M-402

Unit	Course Content	Allotted to	Hours	Month	Remarks
1	• Back cross and test cross.	Bandana Deka	01	Mar	
2	• Varieties of gene expression- multiple alleles, lethal genes, pleiotropic genes, gene interaction, epistasis.		04	Mar	
3	• Linkage- its mechanism and significance, Experiment of linkage, Linkage map.		03	Apr	
4	• Crossing over- types and mechanism, synaptonemal complex and genetic recombination, significance of crossing over.	Dr Sikha Rani Kalita	02	Apr	
5	• Genetic basis of sex determination.		01	Apr	
6	• Genetic diseases in man.		01	Apr	
7	• Nucleic acids- DNA and RNA, Chemical structure and function, Replication of DNA.	Dr Kakali Talukdar	03	Feb	
8	• Structural changes in chromosomes (Chromosomal aberration)		01	Feb	
9	• Numerical changes in chromosome, Genetic consequences of changes in chromosome.		02	Mar	
10	• Mutation- Molecular basis of mutation. Consequences of mutation.		02	Mar	
11	• Genetic code, transcription and regulation of protein synthesis.		03	Mar	
12	• Regulation of gene expression.		02	Mar	
13	• Sexuality and Recombination in Virus and Bacteria.		02	Apr	
14	• Mitochondrial DNA.		01	Apr	
15	• Human Karyotypes- Nomenclature, Human genome.		02	Apr	
16	• Cytogenetic effect of ionizing and non-ionizing radiation		02	May	

Semester	TDC IV Semester	Course	Major
Credit	04	Marks:	40+10=50
Paper Name	Practical	Paper No:	M-403

Unit	Course Content	Allotted to	Hours	Month	Remarks
1	Developmental Biology • Study of frog development through prepared slides and models.	Bandana Deka	04	Mar	
2	• Study of whole preparation of chick embryos from 16-18 hours, 24-28 hrs, 33-36 hrs, 42-48 hrs and 72 hours of development.		06	Mar	
3	Genetics • Squash preparation for the study of mitosis in tadpole tail/ onion root tip.	Dr Kakali Talukdar	02	Mar	
4	• Study of meiosis in testis of Gryllotalpa/ Grasshopper.		02	Apr	
5	• Study of polytene chromosome in salivary glands of Chironomus or Drosophila.	Dr Sikha Rani Kalita	02	Mar	
6	• Study of sex chromatin from buccal epithelium.		02	Apr	

Semester	TDC IV Semester	Course	General
Credit	04	Marks:	40+10=50
Paper Name	Animal Diversity- II (Chordates)	Paper No:	E-401

Unit	Course Content	Allotted to	Hours	Month	Remarks
	• General characters outline classification and plan of body organization in chordates	Dr Kakali Talukdar	02	Feb	
1	• PROTOCHORDATES: General characters, classification of protochordates up to suborder with		04	Feb, Mar	

	examples, Structural organisation of Hemichordata (Balanoglossus), Urochordata (Hardmania) and Cephalochordata (Amphioxus) affinities if Amphioxus.				
2	• AGNATHOSTOMATA: classification, Ammocoete larva		01	Mar	
3	• PISCES: General characters, classification up to order with examples. Anatomical structures of Scoliodon Digestive, circulatory system, nervous System of Scoliodon. Distinction between cartilaginous and bony fishes	Dr Sikha Rani Kalita	06	Feb, Mar	
4	• AMPHIBIA: General characters, classification up to order with examples. Anatomical structures of Bufo with special refernce to respiration. Metamorphosis in Amphibia.		06	Mar	
5	• REPTILIA: General characters, classification up to order with examples. Characteristics of poisonous snake, Poison apparatus and biting mechanism		06	Apr	
6	• AVES: Distinctive characters, classification up to order with examples. Difference between Paleognathae and Neognathae, Flight muscle and flight mechanisms in birds, Migration of bird.	Bandana Deka	09	Feb, Mar, Apr	
7	• MAMMALIA: Distinctive characters, classification up to order with examples. Affinities of Prototheria.		06	May	
8	• General organization of exoskeleton in vertebrates	Dr Kakali Talukdar	02	Mar	
9	• Comparative anatomy of heart and aortic arches in vertebrates		03	Apr	

Semester	TDC IV Semester	Course	General
Credit	04	Marks:	40+10=50
Paper Name	Practical	Paper No:	E-402

Unit	Course Content	Allotted to	Hours	Month	Remarks
1	• Dissection- Afferent and efferent branchial system, Internal ear and IX th and X th cranial nerves of Scoliodon	Bandana Deka	04	Apr	
2	• Slide preparation- Temporary	Dr Kakali Talukdar	02	Mar	
3	• Slide preparation- Permanent	Dr Sikha Rani Kalita	02	Mar	
4	• Identification of prepared slide	Dr Kakali Talukdar	02	Apr	
5	• Study of Bones	Dr Sikha Rani Kalita	02	Apr	
6	• Study of Museum Specimen	Bandana Deka	06	Mar	

Semester	TDC VI Semester	Course	Major
Credit	06	Marks:	60+15=75
Paper Name	Animal Behaviour	Paper No:	M-601

Unit	Course Content	Allotted to	Hours	Month	Remarks
1	• Introduction to Ethology		01	Feb	
2	• Scope and methods of ethology		02	Feb	
3	• Behaviour and equipment- Sign, stimuli, stimulus filtering		02	Feb	
4	• Patterns of Behaviour		02	Feb	
5	• Individual behavioural pattern		01	Feb	
6	• Homeing behaviour		01	Feb	
7	• Genetic basis of behaviour		02	Feb	

8	• Neural and hormonal control of behaviour	Bandana Deka	02	Feb	
9	• Circadian rhythm		02	Feb	
10	• Motivation: Models of motivation of motivation, feeding and drinking		02	Feb	
11	• Learning behaviour: Types of learning, Reasoning and Imprinting		02	Apr	
12	• Socio Biology: Social organization, Individual Social interactions, Animal communications, Dance language of honey bees, Aggregation, Social behaviour of bee, ant and monkey, Role of pheromones.		08	Mar	
13	• Communication; Chemical, Visual, Audio, Language of behaviour, Habitat Selection, Aggression, Territoriality, Dispersal.		05	Apr	

Semester	TDC VI Semester	Course	Major
Credit	06	Marks:	60+15=75
Paper Name	Evolution and Adaptation	Paper No:	M-602

Unit	Course Content	Allotted to	Hours	Month	Remarks
1.1	• Evolution – Origin of life		02	Feb	
1.2	• Spontaneous generation, formation of organic compound.		02	Feb	
1.3	• Evidences of organic evolution: Embryological and biochemical		02	Feb	
1.4	• Theories of organic evolution		01	Feb	
1.5	• Darwinism and Neo-Darwinism		01	Feb	
1.6	• Lamarckism and Neo Lamarckism		01	Feb	
1.7	• Germplasm theory, Mutation theory		02	Feb	

1.8	• Modern synthetic theory	Dr Kakali Talukdar	01	Feb	
1.9	• Concept of micro, macro and mega evolution		02	Feb	
1.10	• Phylogeny of Horse		01	Mar	
1.11	• Evolution of Man		01	Mar	
1.12	• Origin of Bird		01	Mar	
1.13	• Speciation- Genetic and Geographical		01	Mar	
1.14	• Zoo-geography		01	Mar	
1.15	• Factor influencing animal distribution		01	Mar	
1.16	• Geological time scale		01	Mar	
1.17	• Fossils-Definition, fossilization and significance, dating of fossils.		02	Mar	
2.1	• Principles of adaptation	Dr Sikha Rani Kalita	01	Mar	
2.2	• Types of adaptation- Aquatic, terrestrial and Volant adaptation		02	Mar	
2.3	• Adaptive Radiation in mammal		01	Mar	
2.4	• Cryptic and warning coloration, Mimicry.		01	Mar	

Semester	TDC VI Semester	Course	Major
Credit	06	Marks:	60+15=75
Paper Name	Economic Zoology	Paper No:	M-603

Unit	Course Content	Allotted to	Hours	Month	Remarks
1.1	Sericulture • Nature of silk		01	Feb	
1.2	• Concise account of four varieties of silk products and economics in India (Eri, Muga, Pat, Tasar), Life cycle of silk worm- Muga and Eri		07	Feb	
1.3	• Diseases, prevention, and control measures of		02	Feb	

	silkworm pest	Dr Sikha Rani Kalita			
1.4	•Rearing of silkworm- Muga and Eri		02	Feb	
1.5	•Environmental conditions for silkworm rearing temperature, humidity, light and air		02	Feb	
1.6	•Storage, spinning and reeling of silkworm		01	Feb	
2.1	Apiculture •External Morphology of honey bee		01	Mar	
2.2	•Bee colony-cast/members-the queen, worker and drone, life history of honey bee, colony nest		03	Mar	
2.3	•Cast distinction during development of honey bee		02	Mar	
2.4	•Economics of bee keeping		01	Mar	
3.1	Aquaculture •Aquaculture-Definition, Important groups of aquacultures		02	Mar	
3.2	•Fresh water fish groups of India		02	Mar	
3.3	•Captive and culture fisheries		02	Apr	
3.4	•Fresh water prawn culture		02	Apr	
3.5	•Pond fisheries- Construction and layout of ponds of a fish farm		03	Apr	
3.6	•Composite fish culture		02	Apr	
3.7	•Induced breeding		02	Apr	
3.8	•Integrated fish farming		03	Apr	
4	•Lac culture and enemies of lac, uses of lac		03	Apr	
5.1	Pest and pest Management •Definition of term pest, Types of pests	Bandana Deka	02	Mar	
5.2	•Importance of pest control		02	Mar	
5.3	•Principles of pest control- Cultural, Physical, Mechanical and Biological control of Pest		05	Mar	
5.4	•Pesticides and their hazards		02	Mar	
5.5	•Role of natural products and in pest control		02	Apr	
5.6	•Integrated pest management		03	Apr	

Semester	TDC VI Semester	Course	Major
Credit	06	Marks:	60+15=75
Paper Name	Biotechnology, Bioinformatics and Computer Application	Paper No:	M-604

Unit	Course Content	Allotted to	Hours	Month	Remarks
1.1	• Basic concepts in genetic engineering	Dr Kakali Talukdar	01	Mar	
1.2	• Enzymology in genetic engineering- Restriction enzyme, DNA ligases		02	Mar	
1.3	• Tissue culture		02	Apr	
1.4	• Media preparation and sterilisation		01	Apr	
1.5	• Cell culture media preparation and cell harvesting methods		02	Apr	
1.6	• Cloning		01	Apr	
1.7	• Gene libraries- Construction of CDNA, mRNA, isolation		02	Apr	
1.8	• Transferring genes into animal oocytes, eggs, embryos and specific animal tissues		02	Apr	
2.1	• Operating system DOTS, WINDOWS, UNIX	Guest lecture	03	Apr	
2.2	• Programming using C++		02	Apr	
2.3	• Computer aided techniques for data presentation, data analysis, statistical techniques		04	Apr	

Semester	TDC VI Semester	Course	Major
Credit	06	Marks:	60+15=75
Paper Name	Economic Zoology (Practical)	Paper No:	M-605

Unit	Course Content	Allotted to	Hours	Month	Remarks
1	• Identification of different varieties of silkworm (Eri, Muga, Mulberry) larval and adult stages	Dr Sikha Rani Kalita	2	Mar	
2	• Study of life history of honey bee	Bandana Deka	02	Mar	
3	• Study of important pest of paddy, jute, tea, stored grain, cane sugar and vegetables		06	Apr	
4	• Identification of commercially important fishes		02	Apr	
5	• Slide preparation: pollen basket of honeybee, different types of antennae, mouth parts, legs of insects	Dr Sikha Rani Kalita	2	Apr	
6	• Dissection of pituitary from any locally available fish		2	Apr	

Semester	TDC VI Semester	Course	Major
Credit	06	Marks:	60+15=75
Paper Name	(Practical)	Paper No:	M-606

Unit	Course Content	Allotted to	Hours	Remarks
	Submission	Bandana Deka	About 3-4 class	In the month of Mar Teachers will demonstrate the methods
1.1	• Submission of slides			
1.2.	• Submission of body parts of insects			
1.3	• Insect pest, fishes and other insects (10 in each category)			
1.4	• Project: Each student should allot a field-based study and presents the result in the form of a report	Bandana Deka Dr Sikha Rani Kalita Dr Kakali Talukdar	In-Charge teacher will guide the field- based study per student on a given topic	
1.5	• Visit to advanced laboratories/National Park/Wildlife Sanctuary and prepare a note	Bandana Deka Dr Sikha Rani Kalita Dr Kakali Talukdar	Teacher will guide and accompany the tour in the month of Feb/ Mar	

Semester	TDC VI Semester	Course	General
Credit	08	Marks:	80+20=100
Paper Name	Physiology, Biochemistry and Endocrinology	Paper No:	E-601

Unit	Course Content	Allotted to	Hours	Month	Remarks
1.1	•Chemical foundation of physiology- solution, osmotic pressure, diffusion, PK and Ph, buffer	Dr Kakali Talukdar	02	Feb	
1.2	•Physiology of digestion- Digestion of carbohydrates, fats and protein. Function of liver and pancreas, Absorption of dietary components	Dr Sikha Rani Kalita	03	Feb	
.1.3	•Respiration: Exchange of gases, O ₂ transport, respiratory pigments, O ₂ association and dissociation curve, transport and removal of CO ₂	Bandana Deka	04	Feb	
.1.4	•Excretion: Nitrogenous wastes- ammonotelic, ureotelic and uricotelic modes of excretion.	Dr Sikha Rani Kalita	02	Mar	
1.5	•Blood- Composition and function of blood and lymph, Blood group and Blood coagulation	Dr Kakali Talukdar	04	Feb	
1.6	•Initiation and conduction of nerve impulse, Neurotransmitters	Bandana Deka	03	Feb	
2.1	•Biomolecules- Structure, classification and biological significance of carbohydrate, protein and lipid	Dr Kakali Talukdar	04	Feb, Mar	
2.2	•Enzymes nature and classification- Mechanism of enzyme action		02	Mar	
2.3	•Cellular respiration		01	Apr	
3.1	•Brief outline of organisation of endocrine system in mammals with special reference to Pituitary, and Gonads	Bandana Deka	04	Mar	
3.2	•Regulation of hormone secretion		02	Mar	

4.1	• Utility of biostatistics	Dr Sikha Rani Kalita	01	Mar	
4.2	• Mean-Arithmetic, Geometric and Harmonic mean. Median and Mode		03	Mar	
4.3	• Standard deviation, standard error of mean		03	Apr	
4.4	• Graphic representation of data- histogram, bar diagram, Pie diagram		02	Apr	

Semester	TDC VI Semester	Course	General
Credit	08	Marks:	80+20=100
Paper Name	Practical	Paper No:	E-601

Unit	Course Content	Allotted to	Hours	Month	Remarks
1	• Determination of blood group in man	Bandana Deka	01	Apr	
2	• RBC, WBC- total count		02	Apr	
3	• Preparation of haemin crystal		01	Apr	
4	• Biochemical detection of carbohydrate (mono, di, and polysaccharides/ glucose, fructose, sucrose,) protein and lipid	Dr Kakali Talukdar	02	Mar	
5	• Qualitative detection of salivary amylase		02	Apr	
6	• Dissection of pituitary, thyroid, pancreas in Rat/rabbit	Dr Sikha Rani Kalita	3	Apr	
7	• Dissection of Weberian ossicle in fish		1	Apr	
8	• Dissection of pituitary gland in fish		1	Apr	



**Signature of HoD
(Bandana Deka)**