PROGRAMME SPECIFIC OUTCOME OF ZOOLOGY

MAJOR

After completion of the programme, the students will be able to learn:-

PSO 1:
(i) The main objectives of the course is to provide in depth knowledge about biodiversity of non-chordate and systematic.
(ii) Practical based on above paper.

PSO 2:
(i) Included to provide the students with recent development in the field of Biochemistry.
(ii) Practical based Bio-chemistry.

PSO 3:
(i) To provide in-depth knowledge on chordates diversity and their comparative anatomy.
(ii) Practical based on above paper.

PSO 4:
(i) To knowledge on instruments use in biological field and how to apply statistics in bio logy as Bio-instrumentation and Biostatistics.
(ii) Practical based on above paper.

PSO 5:
(i) To study of cell- Biology, Histology and Histochemistry.
(ii) Practical based on above paper.

PSO 6:
(i) To understand the development of animals in Developmental Biology.
(ii) Practical based on above paper

PSO7:
(i) To study the genes in Genetics and Evolution.
(ii) Practical based on above paper.

PSO 8:
(i) To provide in- depth knowledge of Animal Physiology.
(ii) Practical based on above paper.

PSO 9:
(i) To study of interaction with environment in Environmental Biology and Wild Life.
(ii) Practical based on above paper

PSO 10:
(i) To study the hormones in Endocrinology.
(ii) Practical based on above paper.

PSO 11:
(i) To study on parasites and behaviour of animals in Parasitological and Ethologic.
(ii) Practical based on above paper.

PSO 12:
(i) To study biochemistry in molecular level and immune system of body as Molecular Biology and Immunology.
(ii) Practical based on above paper.

PSO 13:
(i) To provide recent technique and computational knowledge in Biology in Biotechnology and Bioinformatics.
(ii) Practical based on above paper.

PSO 14:
(i) To study of economical beneficial or harmful animals in Economic Zoology
(ii) Practical based on above paper.

COURSE PUTCOME OF ZOOLOGY (MAJOR)

COURSE CODE: ZOOM 101 (NON-CHORDATE & SYSTEMATICS)
The course is being design:

CO 1: To study of characters & classification with example of Protozoa, Porifera, Coelentera & polymorphomosm, corel reef formation
CO 2: To study of characters & classification with example of Helminthes, Annelida with excretion, reproduction & importance of Pheritima, coelm & metamerism of Annelids.
CO 3: To study of characters & classification with example of Arhtropoda, mouth parths, larval form, digestion, excretion, vision, affinities.
CO4: To study of characters & classification with example of Molluscadigetion, respiration, excretory of Pila, shell diversity, tortion & detortion Echinodermata, water vascular system in starfish, larvae.
CO 5: To study how to identify and classify animals in Systematic and classification, modern spcies concept, nomenclature, taxonomy-molecular, cyto, chemo& numerical

COURSE CODE: ZOOM 102 (PRACTICAL)
After completion of the course the students will be able to:-

CO 1: Dissection-Earthworm-urigenital system/Pila, Prawn-Nervous system Cockroach –nervous, digestive & reproductive systm
CO 2: Identification- various invertebrates
CO 3: Preparation of permanent slides.
CO 4: Study of morpho-taxonomy of locally available animal.

COURSE CODE ZOOM 201 THEORY(BIOCHEMISTRY)
After completion of the course the students will be able to:-

CO1: To study of law of thermodynamics & application, free energy, ATP & High energy phosphate, redox system, basic principle of biological chemistry-water, acid, base, ph, buffer.
CO2: Str & classi. Of carbohydrates, proteins, amino acid, lipids,
CO3: Metabolism-glycolysis, krebs cycle, ETS, ATP synthesis transcription, b-oxidation.
CO4: Enzymes-IUB classin kinetics, inhibition, vitamins, coenzymes.
CO5: DNA, RNA, Genetic materials, replication, genetic code, tr

COURSE CODE: ZOOM 202 (PRACTICL)
Practical based on paper 201.

COURSE CODE: ZOOM 301 (CHORDATE DIVERSITY & COMPARATIVE)
After completion of the course the students will be able to understand:-

CO1: General character & classification proto, hemi, uro, cephalochordate, larval form, affinities
CO2: Characters etromyzontia, chondrichthyes, dipnoi, ammocoetelarva, strgills, ace, respiratory organs, swim bladder, sense organs, locomotion, migration, parental care.
CO3: Distn characters amphibia, parentalcare, metamorphosis, neoteny, Distin & characters of reptilian, sphenodon, poisonous snakes, biting mechanism.
CO4: Characters & classin of aves & mammals flight & perching mechanism, flight adaptation, dentition in mammals, eco-location, aquatic adaptation.
CO5: Comparative anatoy-fish, amphibian, reptilian, mammalian.

COURSE CODE: ZOOM 302 (PRACTICAL)
Practical based on paper 301

COURSE CODE: ZOOM 303 (BIOINSTRUMENTATION & BIOSTATISTICS)
After completion of the course the students will be able to understand:-

CO1: Chromatography-paper, TLC, ion-exchange
CO2: Microscopy-light, phage-contrast, EM.
CO3: Photometry –colorimeter, spectrophotometer.
CO4: Kymography, microtomy, ultramicrotpmy, centrifugation, autoradiography.
CO5: Biostatistics- sampling, graphical representation, average, mean deviation, SD, probability, correlation & regression, significance test-t, F, X2

COURSE CODE: ZOOM 304 (PRACTICAL)
Practical based on paper 303.

COURSE CODE: ZOOM 401 (CELLBIOLOGY, HISTOLOGY, HISTOCHEMISTRY)
After completion of the course the students will be able to understand:-

CO1: Pro & eurokaryoticcell, mitochondria. lysosomes, ribosomes, ER, GB, nucleous, plasmamemn matrix, receptor medieted endocytosis.
CO2: Chromosomes-poly & lampbrush, neocleosome, DNA packaging, hetero-euchromatin movements.
CO3; Cell-cycle, regulation, normal & malignant, cell division, apoptosis
CO4; Cell-signalling, second messengers, G-protein& coupled receptos.
CO5; Histological methods, classin & properties of dyes, animal's tissues.

COURSE CODE: ZOOM 402 (PRACTICAL)
Practical based on paper 401

COURSE CODE: ZOOM 403 (DEVELOPMENT BIOLOGY)
After completion of the course the students will be able to understand:-

CO1: Gametogenesis & vitellogenesis.
CO2: Fertilization-type & mechanism, parthogenesis.
CO3: Cleavage & gastrulatipn, cleavage pattern, blastulation & gastrulation in chick, germ layers, primary organizers, induction, property, mechanism. Organogenesis-eye & ear
CO5: Extra –embryonic memn in birds, placentation.

COURSE CODE: ZOOM 404 (PRACTICAL)
Practical based on paper 403

COURSE CODE: ZOOM 201 (GENETICS & EVOLUTION)
After completion of the course the students will be able to understand:-

CO1: Menal's laws its analysis, gene, allele, incomplete, factors, epistasis, lethal.
CO2: Linkage & crossing over, gene mapping, sex determination, sex-linked inheritance, cytoplasmic inheritance.
CO3: Fine str of gene, mutation in details, human genetics, inborn metabolism, human chromo, HGP.
CO4: Evolution-evidences, lamerkism, Darwinism, moder synthesis theory, origin of life, variation, isolation, speciation, fossil& fossil formation.
CO5: Population –gene pool, gene frequency, endemism, adaptive radiation.

COURSE CODE: ZOOM 502 (PRACTICAL)
Practical based on paper 401.

COURSE CODE: ZOOM 503 (ANIMAL PHUSIOLOGY)
After completion of the course the students will be able to understand:-

CO1: Muscle contraction- myofilaments, sarcoplasmic reticulum, T-tubules, contraction.
CO2: Digestion & absorption –secretion, regulation, gatro-intestinal hormones, balance-diet.
CO3: Excretion-str & function of nephron, mechanism & regulation urine formation, dialysis,
CO4: Circulation, cardiac cycle, disordes of cardio-vascular system, haemostasis, respiration- haemoglobin,transports,regulation,co2 poisoning, tracheal respiration in insects.
CO5: Nervous system-RMP, action potential, propagation, synopsis & transmission, nerutransmitters, nerumuscular junction, reflex, vision, drugstypes, addiction, effects, social implication.

COURSE CODE: ZOOM 504 (PRACTICAL)
Practical based on paper 503.

COURSE CODE: ZOOM 505 (ENVIRONMENTAL BIOLOGY & WILDLIFE)
After completion of the course the students will be able to understand:-

CO1: Ecosystem, species, communities, biome, biotic abiotic factors, energy flow.
CO2: Shelford's law, liebig's; aws, productivities, population, dynemics, r&k strategy, lotka-volterra model, natality, mortality, predator & prey relationship.
CO3: Biogeochemical cycle renewable & non-renewable resources of NE, Remote sensing, EIA.

CO4: Pollution-water, air, soil, bioindicators, succession, ecological blacklash, GHE, ozone layer depletion.
CO5: ICUN species category, endangered species of NE, threats to biodiversity, man-wildlife conflict, ex &in situ conservation, national park of NE, biosphere reserve, biodiversity hotspot, Indian Wildlife protection act 1972.

COURSE CODE: ZOOM 504 (PRACTICAL)
Practical based on paper 503.

COURSE CODE: ZOOM 505 (ENDOCRINOLOGY)
After completion of the course the students will be able to understand:-

CO1: Comparative anatomy of pituitary thyroid, adrenal, pancreas of fish, amphibian, birds, mammals
CO2: Hormones secreted by endocrine gland & their function.
CO3: Characters of hormones, mechanism of action, regulation, disorders with hypo-hyper secretion.
CO4: Roles in reproductive cycle, pregnancy, lactation, method of contraception, amniocentesis, IVF.
CO5: Neuroendocrine system in insect role of hormones in growth & development of insect.

COURSE CODE: ZOOM 506 (PRACTICAL)
Practical based on paper 505.

COURSE CODE: ZOOM 601 (PARASITOLOGY & ETHOLOGY)
After completion of the course the students will be able to understand:-

CO1: Parasitism-types of parasites, host, vectors, adaptation life cycle of entaoeba, trypanosome, leishmania, giardia, trichomonas, plasmodium.
CO2: Pathogenosity of bacteria, virouses, rickettsia, borrelia, leptospira, life history of, parasitic adaptation & oathogenicity of taenia solium, fasciola, ancylostoma, wucheeria.
CO3: Animal behaviour- history, pattern, sense organs, genetical ecological aspects of behaviour.
CO4: Orientation, communication, learning, offensive & defensive behaviour, insect behaviour.

COURSE CODE: ZOOM 602 (PRACTICAL)
Practical based on paper 601

COURSE CODE: ZOOM 603 (MOLECULAR BILOGY & IMMUNOLOGY)

After completion of the course the students will be able to understand:-

CO1: Genome organization in pro & eukaryotes, DNA, RNA, DNA as genetic materials, forms of DNA.
CO2: Replication & transcription, genetic code, wobble hypothesis, protein biosynthesis in prokaryotes.
CO3: Recombination in prokaryotes; transformation, conjugation & transduction, concept of transposons & plasmids, regulation of gene expression in prokaryotes, operon concept (Lac operon)
CO4: Types of immunity, cell, organ, lymphoid organ, antigens, properties, adjuvant & haptens, antigen-antibody reaction, vaccines, vaccinations
CO5; Immunoglobin; str, classes, function, clonal, poly, monoclonal antibodies, major histocompatibility complex, str 7 functions immune system in health & disease, immunodiagnostic technique (immunodiffusion, RIA, ELISA, AID.

COURSE CODE: ZOOM 604 (BIOTECHNOLOGY & BIOINFORMATICS)

After completion of the course the students will be able to understand:-

CO1: Genetic engineering protoplast fusion & somatic hybridization technique, recombinant DNA technology& application in agriculture, health, industrial biotechnology, production of alcohol & antibiotics.
CO2; Omics, str & function genomics, DNA sequencing, HGP, proteomics, trascriptomics.
CO3: Regulation of biotechnology, production & application of transgenic animals & plants, GMO, IPR, patent & ethical issues.
CO4: Bioinformatics-history & scope, sources of information-internet, www, web browsers, biological database, -NCBI, gene bank, SWISS PROT, ENTREZ.
CO5: Database search & sequence alignment& tools- FASTA & BLAST, methods of sequence alignment, phylogenetic analysis, evolutionary phylogeneny & constructing phylogenetic trees

COURSE CODE: ZOOM 605 (PRACTICAL)

Practical based on paper 603 & 604.

COURSE CODE: ZOOM 603 (ECONOMIC ZOOLOGY)
After completion of the course the students will be able to understand:-

CO1: Major insect pest of paddy, tea, stored grain & their biology, pest management-biology, chemical, culture, IPM.
CO2: Life history of silkworm-eri, muga, mulberry, culture technique of silkworm, disease & prevention.
CO3: Life history of honey bee, rearing, culture, biology & culture of lac insect.
CO4: Principle & practice of aquaculture, fish, prawn, prepn, manag of different types of pond, induce breeding, hybridization technique in fishes, fish preservation and fish by-product.
CO5: Piggery management & practices of pig rearing, poultry, selection breed – chicken & duck & their scientific rearing methods, poultry diseases& its preservation.