



List of Revised Courses

Department : Zoology

Program Name : M. Sc.

Academic Year : 2017-18

List of Revised Courses

Sr. No.	Course Code	Name of the Course
01.	LZT 102	Cell Biology and Evolution
02.	LZT 104	Basic Mammalian Physiology
03.	LZT 201	Biochemistry and Molecular Biology
04.	LZT 202	Regulatory Mammalian Physiology

A. V. K. Bhasra

गुरु घासीदास विश्वविद्यालय
कोनी, बिलासपुर - 495009
Department of Zoology
HEAD
जानवरों के विज्ञान विभाग



Minutes of Meetings (MoM) of Board of Studies (BoS)

Academic Year : 2017-18

School : School of Studies of Life Sciences

Department : Zoology

Date and Time : July, 07, 2017- 09: 30 to 06:30 PM

Venue : Department of Zoology

The scheduled meeting of member of Board of Studies (BoS) of Department of Zoology, School of Studies of Life Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur was held to design and discuss the M. Sc. (I to IV semesters) scheme and syllabi.

The following members were present in the meeting:

1. Prof. Renu Maheshwari (External Expert Member BoS, Dept. of Zoology, Raipur, CG.).
2. Dr. Monika Bhadauria (HOD, Associate Prof., Dept. of Zoology.-cum Chairman, BOS).
3. Dr. Seema Rai (Member BoS, Associate Professor, Dept. of Zoology).
4. Dr. Santosh Singh (Member, Assistant Professor, Dept. of Zoology).

Following points were discussed during the meeting

1. Papers of semester I to IV were thoroughly discussed and less than 20% modifications was approved by the BOS members in seven papers (02 core papers, five discipline specific Electives).
2. More than 20% modifications was suggested by the BOS members in six core papers.
3. One new elective (Biochemistry and Molecular Biology) was introduced in Discipline Specific Electives (DSE) in semester III and IV.
4. Two previously existing discipline specific electives papers were also revised more than 20%.

The committee discussed and approved the scheme and syllabi. The following courses were more than 20% revised for M. Sc. - I and II Semesters:

Sr. No.	Course Code	Name of the Course
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Signature & Seal of HoD



Scheme and Syllabus

NEW-2017-18

Department of Zoology, GGV, Bilaspur (CG) OLC

Approved Scheme of Examination, 2017-18 ②

M.Sc. Zoology

Semester-wise Theory Papers/ Practical/ Skill Component

Type of Course	Course Code	Title of the Course	Lecture-Tutorial-Practical/week	No. of credits	Continuous Comprehensive Assessment (CCA)	End-Semester Examination (ESE) [University-Examination]	Total
Semester - Ist							
Core Course 1	LZT 101	Comparative Anatomy of Vertebrates	4	4	40	60	100
Core Course 2	LZT 102	Cell Biology and Evolution	4	4	40	60	100
Core Course 3	LZT 103	Reproduction and Developmental Biology	4	4	40	60	100
Core Course 4	LZT 104	Basic Mammalian Physiology	4	4	40	60	100
Core Course Practical 1	LZL 105	Lab. Exercises based on courses LZT 101 & 102	6	3	40	60	100
Core Course Practical 2	LZL 106	Lab. Exercises based on courses LZT 103 & 104	6	3	40	60	100
Skill Course 1	LZS 107	Scientific writing skills	2				
				22	240	360	600
Semester IInd							
Core Course 5	LZT 201	Biochemistry and Molecular Biology	4	4	40	60	100
Core Course 6	LZT 202	Regulatory Mammalian Physiology	4	4	40	60	100
Core Course 7	LZT 203	Endocrinology	4	4	40	60	100
Core Course 8	LZT 204	Biotechniques and Bioinformatics	4	4	40	60	100
Core Course Practical 3	LZL 205	Lab. Exercises based on course LZT 201 and 202	6	3	40	60	100

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Department of Zoology, GGV, Bilaspur (CG)

LZT 102: CELL BIOLOGY AND EVOLUTION

Unit 1: Eukaryotes: cell Membrane, Lipid bi-layer and membrane proteins, Transport across the cell membrane, Channels and transporters, Diffusion, osmosis and measurement of osmotic pressure, Active transport: mechanism and related calculations.

Unit 2: Cytoskeleton: organization of microtubules, microfilaments and intermediary filaments. Targeting and sorting of proteins: Signal peptide and SRP dependent targeting of translational complex; Processing of proteins in RER; Processing through Golgi complex: targeting to plasma membrane and lysosome; Targeting of nuclear and mitochondrial proteins; Mitochondria: Structure, assemblies of respiratory chain and $F_0 F_1$ -ATPase; Nucleolus: structure and biogenesis of ribosomes,

Unit 3: An overview of evolutionary thoughts, development and the concept of synthetic theory. Population genetics; Gene frequencies in Mendelian population, Hardy-Weinberg equilibrium Conditions for the maintenance of genetic equilibrium. Elemental forces of evolution: Mutation, Selection (types of selection and selection coefficient), Random genetic drift, Migration.

Unit 4: Chromosomal, allozyme and DNA polymorphisms: Adaptive genetic polymorphism, Balanced polymorphism and heterosis, Genetic condaptation and linkage disequilibrium. Isolating mechanisms: Concepts of species and models of speciation: allopatric, sympatric and stasipatric.

Unit 5: Evolution at molecular level: Genomic and proteomic changes, Molecular phylogenies, Neutral theory, Molecular clock.

Books Recommended

1. Nelson et al: Lehninger Principles of Biochemistry (3rd ed 2004, Pearson)
2. Alberts et al: Molecular Biology of the Cell (4th ed 2002, Garland)
3. Kooper : Cell biology
4. P A Moody: Introduction to Evolution
5. Rastogi: Organic Evolution (2007, Kedarnath & Rannath)
6. Strickberger's Evolution

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LZT 104: BASIC MAMMALIAN PHYSIOLOGY

Unit 1: Integumentary system: Cell junction, epithelial and connective tissue, structure, type and function of skin, accessory structure of skin, aging

Unit 2: Digestion: Anatomy of gastrointestinal tract, Digestive glands (salivary, gastric, bile, pancreatic and intestinal gland), digestion of fat, protein and carbohydrate, nucleic acid, absorption of nutrients, regulation of digestion and absorption, balanced diet, vitamins.

Unit 3: Respiration: Anatomy of respiratory system, pulmonary ventilation, respiration, gaseous exchange, lung volume and capacity, control of respiration, basal metabolic rate, respiratory quotient, Respiratory disorders: hypoxia, dyspnoea,

Unit 4: Cardiovascular: Function properties and component of blood, formation of blood cell, haemostasis, blood group, Structure and function of heart, origin and conduction of cardiac impulse, cardiac cycle and ECG, myocardial infarction, circulatory roots, haemodynamics.

Unit 5: Excretion: Structure and function of kidney, glomerular filtration, tubular reabsorption and secretion, urine formation, transportation, storage and elimination, Kidney function tests, buffer system

Recommended

1. Ganong: Review of Medical Physiology (22nd Ed 2005, Lang Medical Publications)
2. Guyton and Hall: Text Book of Medical Physiology (11th Ed 2006, W.B. Saunders)
3. Keel et al: Samson Wright's Applied Physiology (13th Ed 1989, Oxford Press)
4. Murray et al: Harper's Illustrated Biochemistry (27th Ed 1989, Appleton & Lange)

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SEMESTER II

LZT 201: BIOCHEMISTRY

Unit 1: Laws of thermodynamics and their applications: Concept of free energy and calculations based on free energy change; Metabolism: Concept of metabolic pathways; Energy transduction: glucose and fatty-acids as energy source; Glycogenesis and glycogenolysis; Glycolysis and gluconeogenesis; Krebs cycle; Pentose phosphate pathway; Mechanism and chemiosmotic concept, Bioenergetics of ATP and other high energy phosphate compounds.

Unit 2: Protein structure; Primary structure, peptide bond, Secondary structure, α -helix, β -pleated sheet and bends, Ramachandran plot, Tertiary structure, Forces stabilizing tertiary structure, Domains and motifs-Quaternary structure.

Unit 3: Enzymes: Enzyme kinetics, Lowering of activation energy, Derivation of Michaelis-Menten equation, related calculations and Michaelis-Menten and Lineweaver-Burk plots, Mechanism of action, Active site, substrate binding, transition state analogues and abzyme: Acid-base and covalent catalysis; Concepts of regulation of enzyme activity.

Unit 4: Nucleic acids: Structure, folding motifs, conformational flexibility and supercoiling; Mechanism of DNA replication: DNA polymerases, Origin of replication and formation of primosome, Replication fork and replisome, Termination of replication; DNA damage and repairing mechanism.

Unit 5: Mechanism of transcription: RNA polymerases, Formation of pre-initiation complex at RNA pol II promoter, Processing of hnRNA, Genetic code and mechanism of translation, Post translational modification.

Books Recommended

1. Nelson et al: Lehninger Principles of Biochemistry (3rd ed 2004, Pearson)
2. Zubay et al: Principles in Biochemistry (2nd ed 1995, WCB)
3. Strayer : Biochemistry
4. Lodish et al: Molecular Cell Biology (6th ed 2007, Freeman and Company)
5. Voet and Voet: Biochemistry (2004, John Wiley)
6. Alberts et al: Molecular Biology of the Cell (4th ed 2002, Garland)
7. Kooper : Cell biology

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Department of Zoology, GGV, Bilaspur (CG)

LZT 202: REGULATORY MAMMALIAN PHYSIOLOGY

- Unit 1: Skeletal system:** Structure and function of bone, bone formation, axial skeletal: skull and vertebral column, appendicular skeletal: pectoral and pelvic girdle, limbs, joints. Muscular system: Type function and properties of muscles, skeletal muscle tissue, contraction and relaxation, muscle metabolism, control of muscle tension, muscle proteins.
- Unit 2: Nervous system:** Type of nervous tissue: neuron and glia; structure of brain, cerebrospinal fluid, neural network, cranial nerves, blood brain barrier, spinal cord anatomy, spinal nerves.
- Unit 3: Electrical signal in neurons,** neurotransmitters, Axonal and synaptic transmission: Types of neurons, Membrane potential and action potential, Types of synapses, Excitatory and inhibitory post-synaptic potential, Chemical transmission, neurotransmitters (acetylcholine, catecholamines, serotonin and GABA), neuropeptides.
- Unit 4: Lymphatic system and immunity:** Lymphatic system: structure and function. Immunity: innate and adaptive immunity, Immune cells: types and production, Immune tolerance, Humoral immunity: Antigen and haptens, Primary and secondary response, Immunoglobulins: types, structure and functions, Generation of antibody diversity, Class switching, somatic hypermutation, Concept of clonal selection.
- Unit 5: Cell mediated immunity:** T cell receptor, Major Histocompatibility Complex (MHC), Complement system; Antigen: processing and presentation, T helper cell and lymphocyte activation, Role of cytotoxic T cell, perforin and granzymes; Concept of Vaccination, Regulation of immune responses and Hypersensitivity, Autoimmunity.

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