Maharaja Surajmal Brij University

Bharatpur (Raj.)

SYLLABUS

M.Sc. (P&F)

ZOOLOGY

Only For Session
2020-21

अकादमिक प्रभारी
महाराजा सूरजमल बृज विश्वविद्यालय
भरतपुर (राज.)

M.Sc. ZOOLOGY
(Annual Scheme)

Each Theory Paper	3 hrs. duration	100 Marks
Practical (Two days)	5 hrs. duration	300 marks

1. The Number of papers and the maximum marks for each paper and practical shall be shown in the syllabus for the subject concerned. It will be necessary for a candidate to pass in the theory as well as in practical part of a subject/paper separately.
2. A candidate for a pass at each of the previous and the final Examinations shall be required to obtain (i) at least 36% marks in the aggregate of all the papers prescribed for the examination and (ii) at least 36% marks in practical (s) wherever prescribed at the examination, provided that if a candidate fails to secure at least 25% marks in each individual paper at the examination and also in the dissertation/ Survey report/ field work(if any), wherever not withstanding his having obtained the minimum percentage of marks required in the aggregate for that examination. No division will be awarded at the previous examination. Division shall be awarded at the end of the final examination on the combined marks obtained at the previous and the final examination taken together.
3. If a candidate clears any paper(s) Practical(s) Prescribed at the previous and/or final examination after a continuous period of three years, then for the purpose of working his division the minimum pass of marks only viz. 25% (36% in case of practical) shall be taken into account in respect of such papers/practicals.

M.Sc. PREVIOUS (ANNUAL SCHEME)

Paper - I	Biosystematics and Taxonomy
Paper - II	Structure & Function of Invertebrates
Paper - III	Molecular biology and Biotechnology
Paper - IV	General Physiology
Paper - V	Biochemistry
Paper - VI	Population Genetics and Statistical methods.

(Laboratory Exercises Seminar Demonstration)
Practical Day First and Day Second 300 Marks

Note:- In M.Sc. Zoology Previous Examination the theory papers will have the following pattern.
Question papers will have 5 (five) questions in all having equal marks
(i) Question number I will be compulsory and will have 20 very short answer question of 1 mark each.

(ii) Question numbers 2 and 3 will consist of only short answer type questions with 4 subdivisions of 5 marks each. There will be internal choice in these questions.

(iii) Question numbers 4 and 5 will be long answer type questions with internal choice.

Paper-1: BIOSYSTEMATICS AND TAXONOMY

3 Hours duration **Max. Marks: 100** **Periods : 80**

Theory paper will have the following pattern.

Question paper will have 5 (five) question, having 20 marks each ...

(i) Question number will be compulsory and will have 20 very short answer question of 1 marks each.

(ii) Question numbers 2 and 3 will consist of only short answer type questions with 4 subdivisions of 5 marks each. There will be internal choice in these questions.

(iii) Question numbers 4 and 5 will be long answer type questions with internal choice.

1. Definition and basic concept of biosystematics and taxonomy
2. Trends in biosystematics: Concept of different conventional and newer aspects
   - 2.1 Chemotaxonomy
   - 2.2 Cytotaxonomy
   - 2.3 Molecular taxonomy
3. Molecular perspective on the conservation of diversity
   - 3.1 Diversity and ecosystem process: Theory, achievements and future directions.
4. Dimensions of speciation and taxonomy characters
   - 4.1 Dimensions of speciation - Types of lineage changes: production of additional lineage.
   - 4.2 Mechanisms of speciation, panmictic and apotmictic species.
   - 4.3 Species concept and species category. Different species concepts subspecies and other infra-specific categories.
   - 4.4 Theories of biological classification: hierarchy of categories.
   - 4.5 Taxonomic characters of different kinds, origin of reproductive isolation and biological mechanism of genetic incompatibility, Haldane's rule.
5. Procedure keys in taxonomy.x
   - 5.1 Taxonomic procedures: Taxonomic collections, preservation, correct process of identification.
   - 5.2 Taxonomic keys: Different kinds of taxonomic keys, their merits and demerits.
   - 5.3 Systematic publications and different kinds of publications.

5.4 Process of typification and different Zoological types.

5.5 International Code of Zoological Nomenclature (ICZN) and its operative principles, interpretation and application of important rules. Zoological nomenclature, formation of Scientific names of various texa.

Suggested Reading Material (All latest editions)

1. Kato, M. The Biology of Biodiversity, Springer.
2. Avise, J.C, Molecular Markers, Natural History and Evolution Chapman & Hall, New York.
3. Wilson, E.O, Biodiversity Academic Press, Washington.
4. Simpson, G.G., Principle of Animal Taxonomy. Oxford, IBH Publishing Company.
5. Mayer, E., Principles of Systematic Zoology, McGraw Hill Book Company, New York.
6. Wilson, E.O., The Diversity of Life. W.W. Northern & Company.
7. Tikadar, B.K., Threatened Animals of India, ZSI Publication, Calcutta.
8. Trigunayat, M.M and Kritika Trigunayat. Introductory Biosystematics & Taxonomy Scientific Publishers, Jodhpur.
9. Southwood, T.R.E. Ecological methods (3rd edition). Blackwell Scientific Publishers.

PAPER-II : STRUCTURE & FUNCTION OF INVERTEBRATES

3 Hours duration **Max. Marks: 100** **Periods : 80**

Note: In M.Sc. Zoology Previous Examination the theory paper will have the following pattern.

Question paper will have 5 (five) questions in all having equal marks.

(i) Question number 1 will be compulsory and will have 20 very short answer question of 1 mark each.

(ii) Question numbers 2 and 3 will consist of only short answer type questions with 4 subdivisions of 5 marks each. There will be internal choice in these questions.

(iii) Question numbers 4 and 5 will be long answer type questions with internal choice.

1. Organization of Coelom
   - 1.1 Acoelomates
   - 1.2 Pseudocoelomates
   - 1.3 Coelomates: Protostomia and Deuterostomia.
2. Locomotion
   - 2.1 Flagellar and ciliary movement in Protozoa.
3. Nutrition and Digestion
   - 3.1 Filter feeding in Polychaeta, Mollusca and Echinodernata.
4. Respiration
   - 4.1 Organs of respiration: Gills, lungs and trachea.
   - 4.2 Respiratory pigments.
   - 4.3 Mechanism of respiration
5. Excretion
   - 5.1 Organs of excretion: Coelom, Coelomoducts, Nephridia and Malpighian tubules.
   - 5.2 Mechanisms of excretion.
   - 5.3 Excretion and Osmoregulation
6. Nervous System
   - 6.1 Advanced Nervous system: Annelida, Arthropoda (Crustacea and Insecta) and Mollusca (Cephalopoda)
7. Invertebrate larvae
   - 7.1 Larval forms of free-living invertebrates
   - 7.2 Larval forms of parasites
   - 7.3 Strategies and evolutionary significance of larval forms
8. Minor Phyla

Suggested Reading Material :

1. Hyman, L.H. The Invertebrates, Vol.I, Protozoa through Ctenophora, McGraw Hill Company, New York.
2. Hyman, L.H., The Invertebrates, Vol.II, Protozoa through Ctenophora, McGraw Hill Company, New York.
3. Hyman, L.H., The Invertebrates, smaller coelomate Groups, vol.,5, McGraw Hill Company, New York.
4. Hyman, L.H.,The Invertebrates, Vol.8, McGraw Hill Company, New York.
5. Barington, E.J.W., Invertebrate Structure and Function. Thomas Nelson and Sons Ltd. London.
6. Barnes, R.D., Invertebrate Zoology, W.B., Saunders Co., Philadelphia.
7. Russel-Hunter, W.D., A Biology of Higher Invertebrates, Mc Millan Company Ltd. London.
8. Cad, G.P. Animal Parasitism, Prentice Hall Inc., New Jersey.
9. Sedwick, A. Student Text Book of Zoology, Vol 1, II and III, Central Book Depot, Allahabad.
10. Parker, T.J.,Haswell, W.A., Text Book of Zoology, MacMillan Co.,London.

MOLECULAR BIOLOGY & BIOTECHNOLOGY

Duration: 3 Hours **Max. Marks : 100** **Periods : 80**

Note: In M.Sc. Zoology Previous Examination the theory paper will have the following pattern.

Question paper will have 5 (five) question in all having equal marks.

(i) Question number 1 will be compulsory and will have 20 very short answer question of 1 mark each.

(ii) Question numbers 2 and 3 will consist of only short answer type questions with 4 subdivisions of 5 marks each. There will be internal choice in these questions.

(iii) Question numbers 4 and 5 will be long answer type questions with internal choice.

1. DNA replication
   - 1.1 Prokaryotic and eurokaryotic DNA replication
   - 1.2 Mechanics of DNA replication
2. Transcription
   - 2.1 Prokaryotic Transcription
   - 2.2 Eukaryotic transcription
   - 2.3 General and specific transcription factors
   - 2.4 Regulatory elements and mechanisms of transcription regulation
   - 2.5 Transcription termination
   - 2.6 Transcriptional and post-transcriptional gene splicing
3. Post-transcriptional modifications in RNA
   - 3.1 S'- Cap formation
   - 3.2 End processing and polyadenylation
   - 3.3 Splicing, editing
4. Translation
   - 4.1 Genetic code
   - 4.2 Prokaryotic and eukaryotic translation
   - 4.3 Mechanisms of initiation, elongation and termination
   - 4.4 Regulation of translation
5. Recombination and repair
   - 5.1 DNA repair mechanisms
6. Molecular mapping of genome
   - 6.1 Genetic and physical maps
   - 6.2 Physical mapping and map-based cloning
   - 6.3 Southern and fluorescence, in-situ hybridization for genome analysis

6.4 Molecular markers in genome analysis, RFLP, RAPD and AFLD analysis

7. Transgenic animals
   - 7.1 Production
   - 7.2 Applications
   - 7.3 Embryonic stem cells
8. Assisted reproduction technologies
   - 8.1 ICSI, GIFT etc.
   - 8.2 Cloning of animals by nuclear transfer

Suggesting Reading Material

1. Watson, J.D., Hopkins, N.H., Roberts, J.W., Steiz, J.A., Weinef, A.M.; Molecular Biology of Gene. The Benjamin Cummings Pub Co.: Inc., California.
2. Darnell, J., Lodish, H. and Baltimore, D; Molecular Cell Biology, Scientific American Books, Inc., USA.
3. Albert, B., Bray, D.D., Lewis, J., Rafif M., Roberts, K, Walson, J.D., Molecular Biology of the cell. Garland Publishing company, Inc., New York.
4. Benjamin, Lewin, Gene VIII, Oxford University Press, U.K.
5. Meyers, R.A. (ed.), Molecular Biology and Biotechnology. A Comprehensive Desk Reference. VCH Publishers, Inc, New York.
6. Sambrook, J., Fristsch, E.f. and Maniatis, T.; Molecular Cloning: A Laboratory Manual. Cold Spring Harbor Laboratory Press, New York.
7. Dabre, P.D., Introduction to Practical Molecular Biology, John Wiley & Sons Ltd., New York.
8. Brown, T.A. (Ed.), Molecular Biology Labfax, Vol.I, Bio Scientific Publishers Ltd. Oxford.
9. Karp, G., Cell and Molecular Biology, Concepts and Experiments, John Wiley & Sons, Inc, New York.
10. Botstein, D. Decoding the language of Genetics. Cold spring harbor Laboratory Press.
11. Tropp. Molecular Biology, Genes to Proteins 4/e. Jones Bartlett (Viva Books)
12. Krebs, Goldstein & Kilpatrik. Lewin's Genes XI. Viva Books Pvt. Ltd.

PAPER - IV: GENERAL PHYSIOLOGY

Duration: 3 Hours **Max, Marks: 100** **Periods: 80**

Note:- In M.Sc. Zoology Previous Examination the theory paper will have the following pattern.

Question paper will have 5 (five) questions in all having equal marks

(i) Question number 1 will be compulsory and will have 20 very short answer question of 1 mark each.

(ii) Question numbers 2 and 3 will consist of only short answer type questions with 4 subdivisions of 5 marks each. There will be internal choice in these questions.

(iii) Question numbers 4 and 5 will be long answer type questions with internal choice.

1. Thermoregulation and Cold Tolerance
   - 1.1 Basic principles of metabolism
   - 1.2 Heat balance and exchange
   - 1.3 Endotherms V/s Ectotherms
   - 1.4 Counter-current heat exchanger
   - 1.5 Torpor, hibernation and aestivation
2. Ionic and osmotic balance
   - 2.1 Osmoregulation V/s Osmocon forming
   - 2.2 Osmoregulation in aquatic and terrestrial, environments
   - 2.3 Kidney function and diversity
   - 2.4 Other osmoregulatory organs
   - 2.5 Nitrogenous waste excretion
3. Gas Exchange and Acid-base Balance
   - 3.1 Oxygen and Carbon dioxide transport in blood
   - 3.2 The role of hemoglobin
   - 3.3 Responses to attitude and hypoxia
4. Muscle Function and Movement
   - 4.1 Anatomy of muscle
   - 4.2 Regulation of contraction
   - 4.3 Excitation-contraction coupling
   - 4.4 Molecular theory of muscle contraction
5. Nervous System
   - 5.1 Anatomy of nervous system
   - 5.2 Neurons and membrane excitation
   - 5.3 Electrochemical potentials

5.4 Action potentials

5.5 Transmission between neurons

5.6 Synapses and neurotransmitters

5.7 Memory and learning

6. Sensory Transduction

6.1 Vision and photoreception

6.2 Thermoreception and infrared detection: Prey detection in snakes.

6.2 Echolocation in bats

7. Stress Biology

7.1 Basic concept of environmental stress and strain concept of elastic and plastic strain; stress resistance, stress avoidance and stress tolerance.

7.2 Adaptation, acclimation and acclimatization

7.3 Concept of homeostasis

7.4 Physiological response to oxygen deficient stress.

7.5 Physiological response to body exercise

7.6 Meditation, yoga and their effects.

8. Endocrinology

8.1.1 Hormones as messengers.

8.1.3 Classification of hormones

8.2 Phylogeny of endocrine glands (Pituitary, pancreas, adrenal, thyroid, etc.)

8.3 Ontogeny of endocrine glands.

8.4 Neuroendocrine system and neurosecretion

8.5 General principles, structure and hormone action

8.6 Hormones, growth and development

8.7 Hormones and reproduction.

Suggested Reading Material

1. Eckert, R.W.H.; Animal Physiology, Mechanisms and Adaptations, Freeman and Company, New York.
2. Fochachka, P.W. and Somero, G.N.; Biochemical Adaptation, Princeton, New Jersey.
3. Hoar, W.S.; General and Comparative Animal Physiology, Prentice Hall of India.

4. Schiemdt Nelsen; Animal Physiology: Adaptation and Environment, Cambridge University Press.
5. Strand F.L.,Physiology: A Regulatory Systems Approach, Macmillan Publishing Co., New York.
6. Prosser, C.L.; Environmental and Metabolic Animal Physiology, Wiley Liss, Inc., New York.
7. Willmer, Stone, P.G. and Johnson, I: Environmental Physiology, Blackwll Sci. Publication, Oxford, U.K.
8. Newell, R.C.(ed.); Adaptation to Environment; Essays on the Physiology of Marine Animals. Butter worths, London, U.K.
9. Townsend, C.R. and Cawlow.P. : Physiological Ecology: An Evolutionary Approach to Resource Use, Blackwell, Sci. Publication, Oxford, U.K.
10. Hill, R.W. Wyse, G.A., Anderson, M.: Animal Physiology, Sinauer Associates, Inc, Publishers, Sunderland, USA.
11. Vander.A.J. Sherman J.H. Luciano D.S., Human Physiology McGraw-Hill Publishing Company, New York.
12. Dejours, P.L. Bolis, L.Taylor, C.R., Weibel, E.R. (eds.), Comparative Physiology: Life in water or Land, Liviana Press, Padova, Italy.
13. Johnson, I.A., Bennett, A.F. (eds.), Animals and Temparature, Thenotypic and Evolutionary Adaptations. Cambridge University Press. Cambridge, U.K.
14. Louw G.N. Physiological Animal Ecology, Harloss, U.K.
15. Barrington, E.J.W., General and Comparative Endocrinology clarendon Press, Oxford.
16. Williams, R.H., Text Book of Endocrinology, W.B. Saundes.
17. Martin, C.R. endocrine Physiology, Oxford University Press.
18. Gorbman, A., dickhoff. W.W., Vigna, S.R., Cvlark, H.B., Ralpls, C.L. Comparative Endocrinology, Wiley- Interscience Publication, New York.

PAPER-V: BIOCHEMISTRY

Duration: 3 Hours **Max. Marks: 100** **Periods: 80**

Note: In M.Sc. Zoology Previous Examination the theory paper will have the following pattern.

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(i) Question number 1 will be compulsory and will have 20 very short answer question of 1 mark each.

(ii) Question numbers 2 and 3 will consist of only short answer type questions with 4 subdivisions of 5 marks each. There will be internal choice in these questions.

(iii) Question numbers 4 and 5 will be long answer type questions with internal choice.

1. Covalent properties of Proteins
   - 1.1 Structure and Chemistry of amino acids
   - 1.2 protein sequencing
   - 1.3 Covalent modifications
   - 1.4 Protein size and composition
   - 1.5 Protein splicing
2. Protein secondary and tertiary structure
   - 2.1 Protein Tertiary structure and folding patterns
   - 2.2 Role of packing constraints in tertiary structure patterns.
3. Globular and fibrous proteins.
   - 3.1 Water and the hydrophobic effect.
   - 3.2 Tertiary and quatemary effect.
   - 3.3 Properties of protein interiors and surfaces.
   - 3.4 Fibrous proteins.
4. Protein folding and thermodynamics
   - 4.1 Protein folding and dynamics.
   - 4.2 Folding overview: The levinthal Paradox.
   - 4.3 Condensation and molten globules.
   - 4.4 Ramchandaran plots and amino acid propensities.
   - 4.5 Amino acid sequence variation and membrane protein folding.
   - 4.6 Chaperonin-assisted protein folding.
5. Allostery (Hemoglobin), Myglobin structure and oxygen binding.
   - 5.1 Hemoglobin subunits coopertavity, the Hill coefficient.
   - 5.2 Quarternary Structure changes and Sickle cell and other molecular diseases.

6. Fats
   - 6.1 Fatty acids: Structure, nomenclature, acylglycerols, phospholipids, sphingolipids, glycolipids, lipoproteins,
   - 6.2 Function of lipids.
   - 6.3 Signal transducing molecules.
7. Vitamins
   - 7.1 Classification, occurrence of fat soluble vitamins.
   - 7.2 Classification, occurrence and biological functions of thiamin, riboflavin, folic acid and B_{12}
8. Covalent properties of nucleic acids.
   - 8.1 Modified nucleosides
   - 8.2 Properties of polynucleotides
   - 8.3 Secondary and tertiary structure
9. Nucleic acid structure
   - 9.1 Duplex stability.
   - 9.2 Hybridization.
   - 9.3 RNA structure.
   - 9.4 Hairpin and pseudoknot structures, tRNA.
10. Nucleic acid structure.
    - 10.1 DNA and RNA helical geometrics (A-Z), banding, deformation, triplexes, quadruplexes.
11. Nucleic acid analysis. DNA and RNA sequencing, determination of modified nucleotides. Analysis of nucleic acid secondary structure.
12. RNA Catalysis
    - 12.1 Chemistry and structure of ribozymes.
13. Enzyme mechanisms
    - 13.1 Principles of enzyme catalysis.
    - 13.2 Proteases and polymerases, other example.
    - 13.3 Coenzymes and Cofactors.

Biochemistry

1. Alberts R.H. Frey P.A. and Jencks W.P. Biochemistry Jones, & Bartlett Publisher, Boston/London. 1992.
2. Deb A.C. Fundamentals of Biochemistry, New Book Agency Pvt. Ltd. Calcutta, 2006.
3. Nelson D.L. and Cox M.M. Lehninger Principles of Biochemistry, MacMillan/Worth Publishers, 2001.

4. Stryer L.Biochemistry. W.H. Freeman and Co. New York, 2001.
5. Voet D. Voet J.G. and Pratt. C.W. Fundamentals of Biochemistry, Johan Wiley and Sons Inc., New York, 1999.
6. Wilson K. and Walker.J. Principles and Techniques of Practical Biochemistry Cambridge University Press, Cambridge, 1994
7. Zubay G.L. Parson W.W. and Vence D.E. Principles of Biochemistry. Wm.C.Brown Publishers, Oxford, England, 1995.
8. Harper's Biochemistry by Murray R.K., Granner D.K., Mays P.A., Radwell V.W.McGraw Hill Publication, 2000.
9. Mathews, C.K., Van Holde, K.E., Ahern, K.G., Biochemistry, Pearson Education Pvt. Ltd. Delhi, India, 2003.
10. Horton, H.R., Morson, L.A. Serimgeour, K.G., Perry, M.D., Rawn, J.D., Principles of Biochemistry, Pearson Education, International, 2006.
11. McKee, T.,McKee J.R., Biochemistry (The Molecular Basis of Life) McGraw Hill company, Inc.
12. Elliott, W.H. and Elliott, D.C. Biochemistry and Molecular Biology, Oxford University Press, Oxford, 2003
13. Champe, P.C., Harvey, R.A.; Lippincott's Illustrated Reviews: Biochemistry, Lippincott Williams & Wilkins, Philadelphia.

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PAPER-VI: POPULATION GENETICS AND STATISTICAL METHODS

Duration: 3Hours **Max.Marks : 100** **Periods: 80**

Note:- In M.Sc. Zoology Previous Examination the theory paper will have the following pattern.

Question paper will have 5 (five) questions in all having equal marks

(i) Question number 1 will be compulsory and will have 20 very short answer question of 1 mark each.

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(iii) Question numbers 4 and 5 will be long answer type questions with internal choice.

Unit-1

Statistical Methods

1. Definition and application of Biostatistics.
   - 2.1 Basic statistics-average.
   - 2.2 Statistics of dispersion, coefficient of variation.
   - 2.3 Standard errors: Confidence limits.
   - 2.4 Probability distributions (binomial, Poisson and normal)
   - 2.5 Tests of statistical significance- Students t-test
   - 2.6 Simple correlation of regression.

Unit-II

Population Genetics

1. Concepts of evolution and theories of organic evolution with and emphasis on Darwinism Sexual selection and Zahavi's rule.
2. Neo-Darwinism
   - 2.1 Hardy-Weinberg's law of genetic equilibrium and its applications
   - 2.2 Detailed account of destabilizing forces
     - (i) Natural selection
     - (ii) Mutation
     - (iii) Genetic drift
     - (iv) Migration
   - 2.3 Genetic structure of natural populations.
   - 2.4 Phenotypic variation
   - 2.5 Factors affecting human disease frequency.
3. Molecular population genetics
   - 3.1 Patterns of change in nucleotide and amino acid sequences.

3.2 Ecological significance of molecular variations.

3.3 Emergence of Non-Darwinism-Neutral hypothesis.

4. Genetics of Quantitative traits in populations.
   - 4.1 Analysis of quantitative traits.
   - 4.2 Quantitative traits and natural selection.
   - 4.5 Inbreeding depression and heterosis.
   - 4.6 Molecular analysis of quantitative traits.
5. Genetics of specifications
   - 5.1 Phylogenetic and biological concept of species.
   - 5.2 Patterns and mechanisms of reproductive isolation,
   - 5.3 Models of specification (allopatric, sympatric, parapatric).
6. Molecular Evolution
   - 6.1 Gene evolution.
   - 6.2 Micro-and macro-evolution.
7. Molecular phylogenetics
   - 7.1 Construction of Phylogenetic trees.
   - 7.2 Phylogenetic inference-distance methods, parsimony methods, maximum likelihood method.
   - 7.3 Amino acid sequence and phylogeny.
   - 7.4 Nucleic acid phylogeny-DNA-DNA hybridizations, restriction enzyme sites, nucleotide sequence comparisons and homologies.

Suggested Reading Material (Biostatistics).

1. Batschelet, E: Introduction to Mathematics for Life Scientists Springer, Verlag, Berlin.
2. Allen Bluman Elementary Statistics: A brief version 5(ed).
3. Banden, D., Modelling in Behavioural Ecology, Chapman and Hall London, U.K.
4. Sokal R.R. and Rolf, F.J.: Biometry: Freeman, San Francisco.
5. Snedecor, H.W. and Cochran, W.G., Statistical Methods. Affiliated East West Press, New Delhi.
6. Green, R.H.: Sampling Design and Statistical Methods for Environmental Biologists, John Wiley & Sons, New York.
7. Murray, J.D., Mathematical Biology, Springer-Verlag, Berlin.
8. Bernard Rosmer. Fundamentals of Biostatistics.
9. Wayne. W. Daniel. Biostatistic: Basic Concept & methodology for health Science. Wiley student edition.
10. David L. Strener and Geoffery Norman Biostatistics: The Bare essentials.

Suggested Reading Material (Population Genetics)

1. Dobhzharpsky, T.,Alaya, F.J., Stebbins, G.L., Valentine, J.M, Genetics and Origin of Species, Surjeet Publication, Delhi.
2. Futuyamma, D.J. Evolutionary Biology, suinuaner Associates, Inc., Massachusetts, U.S.A.
3. Hart, D.L., A Primer of Population Genetics, Suinuaer, Suinuaer Associates, Inc., Massachusetts, U.S.A.
4. Jha, A.P. Genes and Evolution, John Publication, New Delhi.
5. King M., Species Evolution: The Role of Chromosomal Charrge Cambridge University Press, Cambridge.
6. Merral, D.J., Holt, R. Evolution and Genetics, Rinchart and Winston, Inc.
7. Smita.J.M., Evolutionary Genetics, Oxford University Press, New York.
8. Strikberger, M.W., Evolution, Jones & Barlett Publishers, Boston, London.