BHARATHIDASAN UNIVERSITY

TIRUCHIRAPPALLI – 620 024

M. Phil. ZOOLOGY (FT / PT) Programme

(For the candidates admitted from the academic year 2009-2010 onwards)

Semester I	Title of the Course	Marks			Credits
		IA	UE	Total	
Course -I	Research Methodology	40	60	100	4
Course - II	Recent Advances in Zoology	40	60	100	4
Course- III	Paper on Topic of Research (Guide will prepare the syllabus and it will be sent to the COE)	40	60	100	4
Course – IV	Teaching and Learning skills (Common Paper)	40	60	100	4
Semester II					
	Dissertation and Viva-Voce Viva Voce 50 marks Dissertation 150 marks			200	8

For each Course other than the Dissertation

Continuous Internal Assessment – 40 Marks
End Semester Examination – 60 Marks

Total – 100 Marks

Question paper pattern for Course I - III

10 questions compulsory 10 x 01 = 10 Marks (2 from each unit)
5 questions 05 x 04 = 20 Marks (either or type, one from each unit)
3 questions from 5 03 x 10 = 30 Marks (one question from each unit)

Total 60 Marks

Question paper pattern for Course IV

5 Questions 05 x 12 = 60 Marks (either or type, one from each unit)

CIA components

Tests (2x10) - 20 Marks
Term Paper – 10 Marks

Seminar - 10 Marks

COURSE I – Research Methodology

Unit I

Library and Research Documentation – Methods of literature collection, online Internet and Website, Technical papers, Reviews, Monographs and Abstract services, Information storage and retrieval, Preparation of index cards, Preparation and presentation of research papers for Journals, Symposia and Conferences-Impact factor-citation index- refereed journals

Scope, Identification and Selection of Research Problem – Experimental approach – Designing of Methodology – Planning and Execution of Investigations – Methods of Editing and Abstracting, Preparation of Manuscript and Proof Reading – Thesis Writing.

Unit II

Principles of Microtechniques – Fixatives and Histological stains – Fixation, Tissue processing and Staining – Freezing Microtomy (Cryostat).

Histochemistry – Fixatives, Histochemical stains – Principles involved in identification of Carbohydrates, Proteins, Lipids, Enzymes and DNA.

Electron Microscopy – SEM, TEM, STEM – Principles and applications – Histological preparations of tissues for SEM & TEM.

Photography – Photomicrography – Image analyzer- Principles and applications.

Unit III

Chromatography – Principles, Types and Applications – Paper, Column, Ion – exchange, TLC, HPLC, GLC, GC – MS, NMR.

Electrophoresis : Principles, Types and Applications – Paper, Agar Gel, PAGE, SDS- PAGE- Gel documentation-2D electrophoresis

Immunological Techniques : Antigen - Antibody preparation and Purification – Immunodiffusion – Immuno electrophoresis, ELISA, RIA Blotting Techniques-Western, Southern and Northern - MALDI and N' terminal sequencing.

Tracer techniques – Autoradiography and its applications – Radiation measuring devices – Geiger Muller Counter, Scintillation Counter – Principle and applications.

Unit IV

pH meter – Principles and applications.

Centrifuge – Principles, types and applications

Spectrophotometry – Principles and applications Uv–Vis, Colorimeter -

Atomic Absorption Spectrophotometer – Flame photometer.

Calorimetry – Wet combustion Bomb calorimeter.

Manometry – Respirometer – Warburg's apparatus – Oxygen analyser.

Unit V

Statistical methods and application : Experimental designs – Sampling – Probability – Normal curve – Test of Significance – Student's 't' – test – Chi – Square test, 'F' test – Analysis of Variance – one way, two way and multiple way of analysis – Correlation coefficients – Simple, Linear and Multiple Correlations – Simple, Linear and Multiple regressions.

Computer Application: Classification – Input and Output devices, Main and auxiliary memories, CPU – Software : System software and applications.

Definition of operating systems of computers, interpreters, assemblers, loaders program algorithm, flow charting, coding, debugging and testing.

Spread sheets and Statistical analysis using EXCEL.

Text Book : Ramakrishnan.S., Swamy, R (1995) Text book of clinical (Medical) Biochemistry & Immunology, TR.Publications, Madras.

Reference Books :

ALLEN, H.BENTON., WILLIAM, E.VERNER, Jr.(1974) Field Biology and Ecology, McGraw Hill Book Co., New York.

ANDERSON, DURSTON, POLLE (1970) Thesis and Assignment Writing, Wiley Easter Limited.

KHAN, T.I., SHISHODIA. (1998) Biodiversity Conservation and Sustainable development Pointer Publishers, Jaipur.

KING, B. (1986) Cell Biology. London, Allen and Unwin Boston, London.

KUMAR, H.D. (1998) Modern concepts of Biotechnology. Vikas Publishing House Pvt. Ltd., New Delhi.

KUMAR, D.KUMAR, S. (1998) Modern concepts in Microbiology. Vikas Publishing House Pvt. Ltd., New Delhi.

****

COURSE II - RECENT ADVACES IN ZOOLOGY

Unit I

Environmental Pollution (air, water and soil) – causes and remedies – environmental impact assessment – Environmental laws – Risk assessment.

Environmental Education, Planning and Management– Bioremediation.- Bio-Indicators and Molecular markers.

Renewable and Non-renewable sources of energy, Conventional and Non-conventional, Solar & Tidal energy – Biogas production – Nuclear energy – Indian nuclear power plants.

Biodiversity – Types, measures of diversity – Bio – diversity conservation laws.

Remote sensing and GIS – Basic concepts.

Unit II

DNA sequencing and Human genome project, DNA finger printing and foot printing, DNA amplification and RT-PCR, Gene and cDNA Library.

Detection of genetic diseases using DNA recombinant technology, screening and counseling – Human gene therapy - Animal cell culture-Primary and established cell line-Stem cell therapy.

DNA methylation, antisense RNA, Transposons, Signalling by receptors.

Cloning technique and its application in Biology, knock out genes– Ethical issues. Reproductive technologies related to human in vitro fertilization.

Unit III

Somatic mutation and oncogenes – Induction of mutation by mutagens, teratogens and carcinogens.

Biofertilizers – composting – Biopesticides – SCP – Production and sources.

Methods involved in the production of Protein- transgenic plants and animals and their uses. Production of recombinant protein, insulin and growth hormone.

Protein Engineering – Enzyme Technology – Terminator genes.

Unit IV

Organization and expression of immunoglobulin gene.

Vaccine – Whole organism vaccines, submit vaccines, recombinant vaccines, DNA vaccines, edible vaccines, synthetic peptide vaccine, multivalent submit vaccine, - development of AIDS and malaria vaccines.

Applications of RIA, immunoflouresence, ELISA, Western blot and monoclonal antibodies in diagnosis of various diseases.

Molecular Diagnostics: Karyotyping - FISH -RFLP

HLA, tissue typing and organ transplantation.

Unit V

Aquaculture : Environmental and Social issues in Coastal Aquaculture – Environmental Management of Shrimp farms – Induced breeding in fish and prawn –monosex - Sex reversal – Use of pituitary, HCG, LHRH, Synthetic hormones, their analogs – administration route – injection – feed – implants – Hybridization – Chromosome manipulations- Polyploids- Gynogenesis and Androgenesis – Environmental and Nutritional probiotics in the management of diseases, Cryopreservation of gametes and embryos.

Reference Books :

ABBAS, A.K.,LICHTMAN, A.K.,POBER , J.S.(1998) Cellular and Molecular Immunology. III Edition W.B.Saunders Company, U.S.A.

BENJAMIN LEWIN. (1999) Genes VII. Oxford University Press, New York.

BRANDEN, C., TOOZE, J. (1999) Introduction to protein structure. II Edition, Garland Publishing , Inc., New York.

DESMOND, S.T., NICHOLL. (1994) An introduction to genetic engineering Cambridge University Press, New York.

JONATHAN GRAVES, DUNGAN REAVEY (1996) Global Environmental Change. Plant, Animal and Communities. Long man.

HAWKINS, J.D. (1996) Gene structure and expression. III Edition. Cambridge University Press, New York.

****

COURSE –IV – TEACHING AND LEARNING SKILLS

Objectives:

- acquaint different parts of computer system and their functions
- understand the operations and use of computers and common Accessories
- develop skills of ICT and apply them in teaching learning context and Research
- appreciate the role of ICT in teaching, learning and Research
- acquire the knowledge of communication skill with special reference to its elements, types, development and styles
- understand the terms communication Technology and Computer mediated teaching and develop multimedia / e-content in their respective subject
- understand the communication process through the web
- acquire the knowledge of Instructional Technology and its Applications
- develop different teaching skills for putting the content across to targeted audience

Unit I – Computer Application Skills

Computer system: Characteristics, Parts and their functions – Different generations of Computer – Operation of Computer: switching on / off / restart, Mouse control, Use of key board and some functions of key – Information and Communication Technology (ICT): Definition, Meaning, Features, Trends – Integration of ICT in teaching and learning – ICT applications: Using word processors, spread sheets, Power point slides in the classroom – ICT for Research: On-line journals, e-books, Courseware, Tutorials, Technical reports, Theses and Dissertations

Unit II – Communication Skills

Communication: Definitions – Elements of Communication: Sender, Message, Channel, Receiver, Feedback and Noise – Types of Communication: Spoken and written; Non-verbal communication – Intrapersonal, Interpersonal, Group and Mass communication – Barriers to communication: Mechanical, Physical, Linguistic & Cultural – Skills of communication: Listening, Speaking, Reading and writing – Methods of developing fluency in oral and written communication – style, Diction and Vocabulary – Classroom communication and dynamics

Unit III – Communication Technology

Communication Technology: Bases, Trends and Developments – Skills of using Communication Technology – Computer Mediated Teaching: Multimedia, E-content – Satellite-based communication: EDUSAT and ETV channels, Communication through web: Audio and Video applications on the Internet, interpersonal communication through the web.

Unit IV – Pedagogy

Instructional Technology: Definition, Objectives and Types – Difference between Teaching and Instruction – Lecture Technique: Steps, Planning of a Lecture, Delivery of a lecture – Narration in tune with the nature of different disciplines – Lecture with power point presentation – Versatility of lecture technique – Demonstration, Characteristics, Principles, Planning Implementation and Evaluation – Teaching – Learning Techniques: Team Teaching, Group discussion, Seminar, Workshop, Symposium and Panel Discussion – Models of teaching: CAI, CMI and WBI

Unit V – Teaching Skills

Teaching skill: Definition, Meaning and Nature – Types of Teaching skills: Skill of Set Induction, Skill of Stimulus Variation, Skill of Explaining, Skill of Probing Questions, Skill of Black Board writing and Skill of Closure – Integration of Teaching Skills – Evaluation of Teaching Skills

References:

1. Bela Rani Sharma (2007), Curriculum Reforms and Teaching Methods, Sarup and sons, New Delhi
2. Don Skinner (2005), Teacher Training, Edinburgh University Press Ltd., Edinburgh
3. Information and Communication Technology in Education: A Curriculum for Schools and programme of Teacher development, Jonathan Anderson and Tom Van Weart, UNESCO, 2002
4. Kumar K.I (2008) Educational Technology, New Age International Publishers, New Delhi
5. Mangal, S.K. (2002) Essential of Teaching – Learning and Information Technology, Tandon Publications, Ludhiana

6. Michael D. and William (2000), Integrating Technology into Teaching and Learning: Concepts and Applications, Prentice Hall, New York
7. Pandey S.K. (2005) Teaching Communication, Commonwealth Publishers, New Delhi
8. Ram Babu A. and Dandapani S (2006) Microteaching (Vol.1&2) Neelakamal Publications, Hyderabad
9. Singh V.K. and Sudarshan K.N. (1996) Computer Education, Discovery Publishing Company, New York
10. Sharma R. A. (2006) Fundamentals of Educational Technology, Surya Publications, Meerut
11. Vanaja. M. and Rajasekar S. (2006) Computer Education, Neelkamal Publications, Hyderabad.

****