SRI VENKATESWARA UNIVERSITY::TIRUPATI
S.V.U. COLLEGE OF SCIENCES;
DEPARTMENT OF ZOOLOGY
(Syllabus common for SV University College and affiliated by SVU Area
W.E.F. 2021-2022
SCHEME OF INSTRUCTION AND EXAMINATION
M.Sc. ZOOLOGY
Semester – IV

S.No	Components of Study	Title of the Course	Status of Paper	Title of the Paper	Credit Hrs / Week	No. of Credits	IA Marks	Semester End Marks	Total
1	Core*	ZOO-401	Mandatory	Toxicology	6	4	20	80	100
2		ZOO-402	Mandatory	Comparative Animal Physiology	6	4	20	80	100
3	Generic Elective	ZOO-403A	Optional -1	Biodiversity and Conservation	6	4	20	80	100
		ZOO-403B		Animal Husbandry and Poultry Farming					
4	Practical - II	ZOO-404P	Core & Generic Electives	Lab-1	6	4		100	100
5	Multi Disciplinary Course / Project Work	ZOO-405	Mandatory (Theory + Practical)	Principles and Practices of Aquaculture	6 (3+3)	4	10	90 (40 + 50)	100
6	Open Elective	ZOO-406A	Optional - 1	Environmental Microbiology	6	4	20	80	100
		ZOO-406B		Medical Biotechnology, IPR, Biosafety and Bioethics					
	Total				36	24	120	480	600

***All CORE Papers are Mandatory**

- **Generic Elective - Choose two**
- **Core papers and Generic elective opted paper held Practical-II**
- **Project Work – Collaboration with various firms/companies/societies.**
- **Multi-disciplinary course is Mandatory. Circle formation with other subjects/Dept. of Arts/Commerce**
- **Open Electives are for the Students of other Departments. Minimum One paper should be opted. Extra credits may be earned by opting for more number of open electives depending on the interest of the student through self study.**
- **Interested students may register for MOOC with the approval of the concerned DDC.**

GENERIC ELECTIVE : ZOO-403B MEDICAL BIOTECHNOLOGY, IPR, BIO-SAFETY AND BIO-ETHICS

Course objectives:

While studying the **Medical Biotechnology, IPR, Bio-safety and Bio-ethics** course, the student shall be able to:

1. Study the types of Gene therapy and its uses in Medical Biotechnology
2. This course is designed to develop the knowledge on PCR, Immunological assays, cloning and animal cell culture techniques.
3. To study the fertilization, organogenesis, potency and differentiation, Morphogenesis in the developmental biology.
4. To gain knowledge on bacterial, plant and animal viruses.
5. This course helps to adhere to the ethical practices appropriate to the discipline at all times.
6. Adopt to the safe working practices, relevant to the bioindustries and research field.

UNIT-1.

Disease diagnosis-probe: PCR,LCRimmunologicalassay. Detection of genetic, Neurogenetic disorders involving Metabolic and Movement disorders.Treatmentproducts from recombinant and non-recombinant organisms, Interferons, Antisense therapy, cell penetrating peptides, Gene therapy, Types of gene therapy, somatic virus germline gene therapy, mechanism of gene therapy, Immunotherapy, Detection of mutations in neoplastic diseases MCC, SSCP, DGGE, PTTC.

UNIT-2.

Animal Biotechnology: Development Biology; fertilization and organogenesis, Stem cells; potency and differentiation, different signaling for development, Morphogenesis in different model systems, Cloning; Transgenic and knockout systems. Animal cell Culture methods.

UNIT-3.

Virology: Classification and modes of propagation; bacterial, plant and animal viruses: morphology and ultrastructure; assay of viral particles, cell culture;viral enzymes, nucliec acids, DNA viruses: Herpes, Hepatitis B, Adeno virus; RNA viruses: Polio, VSV, Influenza, Retroviruses: Structure, life cycle, transformation; TMV, Baculoviruses,; Response to viral infections: slow and persistent infections, Antiviral agents, Interferons.

Economics, Biosafety. Patent rights and Special Topics Biotechnology R & D and industry: Business aspects of biotechnology, research and market place, Finance and human resources: Intellectual property right: patents, R & D partnership, license agreement and joint venture.

UNIT-4.

Innovation Management: Technology transfer tools, Industry-Academia collaborations, Bio-incubators, Bio-accelerators, Finishing school; Bioethics: Role of bioethics in research. Prevention and management of plagiarism, fabrication/manipulation of data, conflict of interest, socio-cultural and behavioral conflicts during the conduct of research. Authorship & patenting/commercial rights and conflicts. Bioethical norms governing research related to animals and humans.

Biosafety: Prevention and management of chemical and biological hazards associated with research. Evaluation and interpretation of data sheets, labels etc. for pre-assessment of biological and chemical hazard.

Course Outcomes:

1. Student comes familiar with the Application of Biotechnological techniques in control of neurogenetic diseases and neoplastic diseases.
2. Students will gain awareness about Intellectual Property Rights (IPR) to take measures for protecting their ideas.
3. Gains knowledge on the Developmental stages of organism in Animal Biotechnology.
4. They will be able to devise business strategies by taking account of IPRs.
5. Students will develop awareness about bioethics and biosafety, Authorship and patenting / commercial rights and conflicts.
6. Students will develop the knowledge on bacterial, plant and animal viruses.

SUGGESTED READING MATERIAL:

1. Sasson A, Biotechnologies and Development, UNESCO Publications, 1988.
2. Mike Martin and Roland Schinzinger, “Ethics in Engineering”, Mc Graw-Hill, Newyork, 1996.
3. Sasson A. Biotechnologies in developing Countries present and future, UNESCO Publishers, 1993.
4. Biosafety: Principles and Practices (Biological safety: Principles and Practices) by Diane O., Ph.D. Fleming and Dbra Long Hunt (Aug 30, 2006).
5. S.F. Gillbert, Developmental Biology, Sinauer Associates Inc., Massachusetts
6. Schatten and Schatten. Molecular Biology of Fertilization.
7. Bioethics and Biosafety in Biotechnology, SreeKrishna.V. (2007), New Age International Publishers.