

B. Sc MICROBIOLOGY (CBCS STRUCTURE)

SEC-2: MB 401: FUNDAMENTALS OF BIOINFORMATICS IV SEMESTER (2 HPW-2Credits)

Course Objectives

- Learn about the Human Genome Project (HGP).
- Concept of "Omics" Biology
- Learn about methods to sequence DNA and proteins.
- Introduce biology behind gene-editing technologies.

Unit 1: Introduction to Bioinformatics and Biological Databases

1. Human Genome Project.
2. Bioinformatics and overview of genomics, transcriptomics, and proteomics
3. Biological Databases: primary and secondary, knowledgebases, databases for sequence, structure, metabolic pathways. interactions
4. Searching databases with text and sequence queries (BLAST)
5. Pair-wise and multiple sequence alignment

Unit 2: Technologies for HTS

1. Methods to characterize the genome: first, second and third generation sequencing techniques for DNA
2. Methods to characterize the transcriptome: PCR and RNA sequencing
3. Methods to characterize the proteome: peptide sequencing and MS methods
4. Analytical methods: Microarrays to study the genome and transcriptome
5. Genome engineering using ZFN, TALENs, and CRISPR

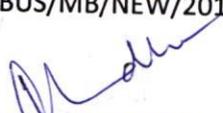
REFERENCES:

1. Saxena Sanjay (2003) A First Course in Computers, Vikas Publishing House
2. Pradeep and Sinha Preeti (2007) Foundations of Computing, 4th ed., BPB Publications
3. Lesk M.A. (2008) Introduction to Bioinformatics. Oxford Publication, 3rd International Student Edition
4. Rastogi S.C., Mendiratta N. and Rastogi P. (2007) Bioinformatics: methods and applications, genomics, proteomics and drug discovery, 2nd ed. Prentice Hall India Publication
5. Primrose and Twyman (2003) Principles of Genome Analysis & Genomics. Blackwell
6. Ghosh, Z. and Mallick, V. (2008) Bioinformatics- Principles and Applications. Oxford University Press.

Course Outcomes

- Understand the HGP has changed biology.
- Perform DNA/protein sequences from a database.
- Understand HT (High Throughput) methods.
- Understand CRISPR technology.

CBCS SYLLABUS/MB/NEW/2016

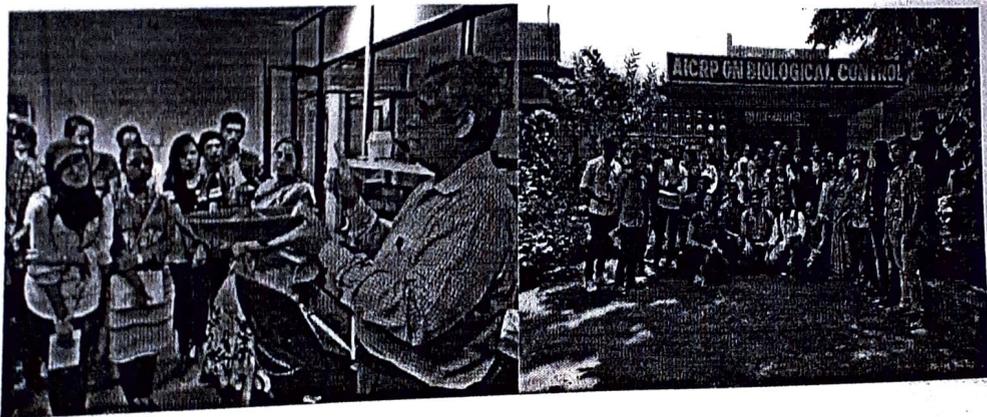

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2017

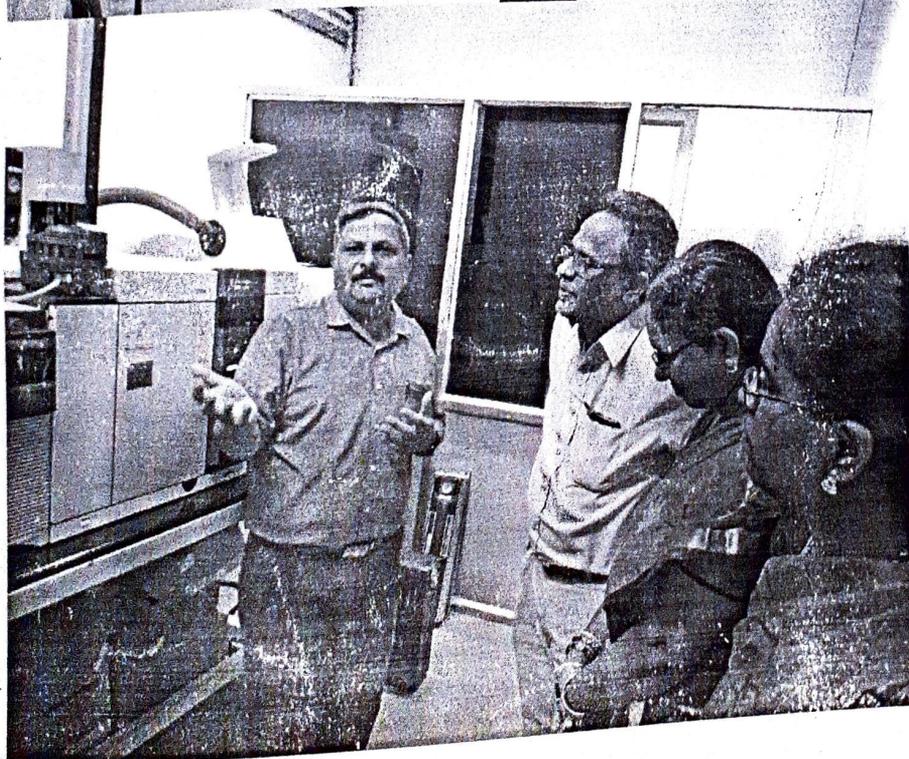
Dr. S. Shalini Devi

Students of Bsc 2nd year visited Agricultural Research Institute (ARI), Prof. Jayashankar Telangana State Agri. University, Rajendranagar on 9th September 2017 as a part of their skill enhancement course. Forty five enthusiastic students participated in this visit organised by department of microbiology, Bhavan's Vivekananda college, sainikpuri. During this visit, Dr. S. J. RAHMAN, Principal Scientist & Univ. Head of Entomology interacted with students and explained them about various aspects and advantages of biological control. He also encouraged students to take up research programmes in the field of Agricultural microbiology.



IKP (Innovative Knowledge Park) Visit

Department of Microbiology organized an industrial visit to IKP (Innovative Knowledge Park) at Genome Valley. B.Sc and M.Sc Microbiology students were accompanied with the staff members for the visit on 16th September 2017 and 22nd August 2017 respectively. As part of the visit students were given awareness on the support initiated at the IKP for Industrial start ups. They were briefed on the facility for Incubator systems and the guidance for funding for new ventures. Working and applications of the instruments like ICPMS (Ion Coupled plasma Mass Spectrometry), Gas Chromatography, and High Proficiency Liquid Chromatography (HPLC) were also demonstrated.



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