Approval: 9th Senate Meeting

Course Name: Computational Biology and Cellular Bioprocess Technology Lab

Course Number: BY521P

Credit: 0-0-2-1

Prerequisites: - None

Students intended for: M. Tech. Biotechnology

Elective or Core: Core Lab for M. Tech. Biotechnology

Semester: Odd/Even

Course objective: This course gives a hands-on training to the students on methods used routinely in quantitative biology and computational biology. These are essential components for statistical analysis of biological data. The computational biology aspects will introduce the students with additional practical skills that will allow them to handle biological data comprehensively. The laboratory component in Cellular Bioprocess technology provides the hands-on experience benefitting the students with right skills required for the practical analysis of cell culture technology, bioprocess principles and strategies to optimise the industrial cellular strains.

- Statistical analysis using biological data using statistical software (R or excel)
- Basic scripting – Perl
- Biological databases and sequence file formats
- Local alignment + global alignment exercise
- Prokaryotic gene prediction methods
- Eukaryotic gene prediction methods
- phylogenetic analysis
- Computational Proteomics: Protein visualization tools
- Growth kinetics of industrial strains-includes media design and parameter controls
- Fermentation experiments including product analysis and downstream processing
- Batch and/or chemostat experimental design and implementation
- Bioprocessing of microbial and/or plant (including algal) systems in the context of Biofuels, bioplastics, enzymes and/or other chemicals.
- Field visit and/or miniproject -local bioprocessing unit, Bioreactor design (lab scale vs hungate tube)