



Dr. B. R. AMBEDKAR UNIVERSITY-SRIKAKULAM

**III B. Sc (BIO-TECHNOLOGY) SYLLABUS
STRUCTURE UNDER CHOICE BASED CREDITS SYSTEM
REVIEWED SYLLABUS w.e.f. 2016-17**

Semester-VI Syllabus

Title of the Paper: Environmental Biotechnology (Elective Paper-VII)

Theory: 100 Marks (Internal = 25 Marks; External = 75 Marks); Practical = 50 M

Unit-I: Role & Scope of Environmental Biotechnology; applications of Recombinant DNA technology in environmental biotechnology.

Unit-II: Conventional energy sources & their impact on environment: Coal, Natural gas, Fossil fuels, Thermal power, fire wood, Hydro power & Nuclear power.

Unit-III: Nonconventional energy & fuel sources: Wind energy, solar energy, geothermal energy & Biogas production (anaerobic digestion) & applications, Microbial hydrogen production by hydrogenase and nitrogenase.

Unit-IV: Analysis of water quality: COD, BOD, MNP method, Membrane filter method; Biological treatment of municipal waste water and industrial effluents.

Unit-V: Bio fertilizers, Bio pesticides, Microbial ore leaching, Bioremediation & Phytoremediation

Reference Books: 1. Biotechnology – U. Satyanarayana.

Practicals:

1. Performance of serial dilution technique
2. MPN Method for determination of Microbial Quality of Water
3. Membrane Filter Technique
4. Multiple tube fermentation technique for Coli Forms
5. Starch Hydrolysis
6. Determination of BOD of effluent sample

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B. Sc III Year Bio-Technology Semester-VI Syllabus
W.E.F 2015-16 Admitted Batch

Title of the Paper: Industrial Biotechnology (Cluster Paper-VIII)

Theory: 100 Marks (Internal = 25 Marks; External = 75 Marks); Practical = 50 M

Unit-I: Over view of Fermentation & Bioreactor, Biochemistry of fermentation.

Unit-II: Basic concepts of upstream and downstream processing in Bioprocess

Unit-III: Primary Metabolites: Production of organic acids (Citric acid), amino acids (L-Glutamic acid) and alcohols (Ethanol).

Unit-IV: Secondary Metabolites: Production of Antibiotics (Penicillin), Vitamins (B₁₂) and Steroids (Glucocorticoids).

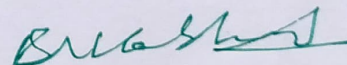
Unit-V: Production of industrial enzymes, Biopolymers, Biodiesels, Single Cell Proteins, Mushrooms. Therapeutically important recombinant protein production (Insulin, Hepatitis-B vaccine)

Reference Books: 1. Satyanarayana, U. "Biotechnology" Books & Allied (P) Ltd., 2005.

2. Dubey, R.C. "A Textbook of Biotechnology" S. Chand & Co. Ltd., 2006.

Practicals:

1. Isolation of lycopene from tomato paste
2. Isolation of Carotene from Carrot paste
3. Enzyme activity – Effect of pH, Temperature
4. Enzyme immobilization & study of its activity at different pH & Temperatures
5. Demonstration on Bioreactor



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Title of the Paper: Marine Biotechnology (Cluster Paper-IX)

Theory: 100 Marks (Internal = 25 Marks; External = 75 Marks); Practical = 50 M

Unit-I: Transgenic Fish; Production of transgenic fishes: Gene transfer techniques (Micro injection, Electroporation, Sperm mediated transfer, Retroviral vectors, Biolistic method, Lipofection), & Transgene integration (Nuclear Localizing sequence, Integrase protein of retro virus, Employing transposase)

Unit-II: Marine viruses: Classification and its associated diseases, Marine bacteria: Classification & its associated diseases

Unit-III: Histology, Serology & Nucleic acid based disease diagnosis methods in aqua culture

Unit-IV: Biofouling, Biofilms, corrosion & antifouling treatment in aqua culture

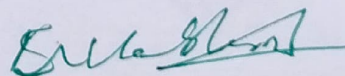
Unit-V: Pearl production, important marine products: Bioactive compounds, GFP & RFP (Characteristics & their applications), Green Mussel Adhesive Protein, Chitosan & its Applications

References:

Advances in Marine Biotechnology – A.S. Ninawe, Joseph Selvin & G. Seghal Kiran

Practicals:

1. Evaluation of fish products for Organoleptic, Chemical & Microbial quality
2. Preparation of Chitosan from Shrimp or Shell fish
3. PCR based diagnosis of Viral & Bacterial infections
 - a. Sample collection
 - b. DNA Isolation / Total RNA Isolation
 - c. cDNA synthesis & Primer design
 - d. PCR Amplification, Electrophoresis & Detection



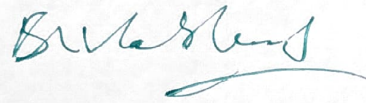
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7. Record

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8. Viva

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