

**SARDAR PATEL UNIVERSITY**  
**Programme: B.Sc (Environmental Science)**  
**Semester: V**  
**Syllabus with effect from: June 2013**

<b>Paper Code: US05CENV01</b>	<b>Total Credit: 3</b>
<b>Title Of Paper: Environmental Biotechnology</b>	

Unit	Description in detail	Weightage (%)
<b>I</b>	<b>Bioremediation</b> Definition, Scope, Application Bioremediation of Contaminated soils and Aquifers, Marine pollutants, Oil pollutants and Air pollutants. Bioremediation of Metals, Recovery of metals , Microbial assimilation of metals, Bioleaching of Copper, Gold and Uranium Phosphate recovery, Recovery of Petroleum.	<b>25%</b>
<b>II</b>	<b>Phytoremediation</b> Introduction, Mechanism, Types of Phytoremediation: Enhanced Rhizosphere degradation, Phytodegradation, Phytoextraction, Rhizofiltration, Phytovolatilization, Phytostabilization, Applications of Phytoremediation.	<b>25%</b>
<b>III</b>	<b>Tissue Culture</b> Plant tissue Culture - Introduction, Totipotency of cell, General process, tissue culture laboratory and Instruments, advantages, Callus culture, Anther culture, Protoplast culture. Animal tissue Culture - Introduction, Technique, Advantages, Limitations, Applications, Cryopreservation.	<b>25%</b>
<b>IV</b>	<b>Fundamentals of Environmental Biotechnology:</b> Environmental Biotechnology - Introduction, Recombinant DNA technology and various steps involved and its application, Gene transfer in plants and animals with suitable examples, Brief account of cloning vehicles and its applications. Release of GMO and their risk assessment.	<b>25%</b>

**Basic Text & Reference Books:**

- A textbook of Biotechnology - R.C. Dubey
- Biotechnology- A textbook of Industrial Microbiology - Wulf Gueger and Anneliese Crueger
- Biotechnology and Genomics - P.K. Gupta
- Biotechnology- Expanding Horizons - B.D.Singh
- A textbook of Biotechnology - H.K.Das
- Textbook of Agriculture Biotechnology by Ahindra Nag
- A Book of Tissue culture by Kalyan Kumar Dey

