

5th Semester	RBT5C003	Plant Biotechnology	L-T-P 3-0-0	3 Credits
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Module I:**(8 Hours)**

Plant genome organization, Organization and expression of chloroplast genome and mitochondrial genome, Cytoplasmic male sterility.

Module II:**(8 Hours)**

Intergenomic interaction, Agrobacterium and crown gall tumors: - Ti plasmid & Ri Plasmid vectors. Mechanism of T-DNA transfer to plants, Agro infection. Plant viral vectors. Direct transformation of plants by physical methods.

Module III:**(8 Hours)**

Genetic engineering in plants:-Selectable markers, Reporter genes and Promoters used in plant vectors. Genetic engineering of plants for bacteria, fungi, virus, pest and herbicide resistance.

Module IV:**(8 Hours)**

Conventional plant breeding, Introduction to cell and tissue culture, tissue as technique to produce novel plants and hybrid. Tissue culture media (composition and media), Initiation and maintenance of callus and suspension culture; single cell clones.

Module V:**(8 Hours)**

Applications of secondary metabolites: Isolation and characterization – drug development, Biopesticides, growth regulators, Biofertilizers. Value addition via bio transformation. Biocatalyst, Bio remediation, Bio fuels, Feed stock Chemicals, Designer Chemicals.

Books:

- [1] Plant Biotechnology by J. Hammod, P. McGarvey, V. Yusibov.
- [2] Plant cell and Tissue Culture for the production of Food Ingredients by Fu, Singh and Curtis.
- [3] Biotechnology in crop improvement. H.S.Chawla.

Digital Learning Resources:

Course Name:	Plant Biotechnology
Course Link:	https://nptel.ac.in/courses/102/103/102103016/
Course Instructor:	Dr. Rakhi Chaturvedi, IIT Guwahati