

Course title: Genome Structure and Diversity: Concepts and Methodologies			
Course code: BBP 146	No. of credits: 3	L-T-P: 23-22-0	Learning hours: 45
Pre-requisite course code and title (if any): None			
Department: Department of Biotechnology			
Course coordinator(s): Prof. Anandita Singh		Course instructor(s): Prof. Anandita Singh	
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Course type: Core		Course offered in: Semester 2	
<p>Course description:</p> <p>The extraordinary diversity among living organisms is reflective of structural and functional diversity of genomes. The tree of life is strident evidence of evolutionary processes underlying biological variation. Genome elucidation studies are crucial for gaining insights into the molecular basis of morphological diversity and trait variation. This advanced course provides a conceptual framework on genome architecture and experimental methods for analysis of its components and sequences. In the first module, students will gain insights on features of diverse genomes, hierarchies of genome organisation, variability in genome complexity and content and dynamic nature of genomes at varying levels of resolution. In the second module, a critical appraisal of traditional marker techniques and modern, sophisticated genotyping platforms vis-à-vis relative efficiencies in polymorphism detection will be discussed. Introduction to next generation, genomics based, genotyping platforms will sensitize the students to frontier areas of research directed towards sustainable agriculture, generation of climate resilient crops and healthcare products. Third module is designed to inform the students, by way of interesting case studies, application of markers in sectors of plant, animal and microbial biotechnology. Through this course, students will gain a holistic perspective on “genotype-phenotype association” by integration of core principles related to diverse disciplines as molecular genetics, genomics and evolution.</p>			
<p>Course objectives:</p> <ol style="list-style-type: none"> 1. Building perspectives on structure and variability in genomes and its constituents 2. Illustrating the relationship between genotypic and phenotypic variation 3. Introducing versatile methodologies, concepts and applications of molecular marker techniques 			