

Semester	JAN 2022
Open to semester	4
Course code	<b>BI2233</b>
Course title	<b>Genetics</b>
Credits	3 /
Course Coordinator & participating faculty (if any)	Mridula Nambiar, Kalika Prasad
Nature of Course	Lectures and Tutorials
Pre-requisites	1st year Biology courses
Objectives (goals, type of students for whom useful, outcome etc)	The goal of this course is to build upon basic Genetics, which the students learnt in their high school and the first few semesters at IISER-Pune. This course will help revise basic concepts and then introduce advanced concepts. A strong emphasis will be laid on modern tools and techniques as well as the utility of model organisms.
Course contents (details of topics /sections with no. of lectures for each)	<ol style="list-style-type: none"> <li>1) Mendelian Genetics</li> <li>2) Non-Mendelian Genetics: Linkage, Incomplete Dominance, Maternal Inheritance, Extra-nuclear inheritance, Sex-linked inheritance, Sex determination, Dosage Compensation, Genomic imprinting</li> <li>3) The Chromosomal basis of inheritance</li> <li>4) Bacterial, phage and fungal genetics. Bacterial transposons. Vertical and Horizontal gene transfer. Genetic Complementation and Mapping</li> <li>5) Genetic screens as a basis for functional genomics. Deficiencies, EMS &amp; X-ray based mutagenesis screens. Creating alleles. Enhancer traps, EP-Lines, RNA inheritance, FLP-FRT &amp; Cre- Lox Systems, Mutant screens</li> <li>6) Gene isolation, manipulation and the techniques that revolutionized modern genetics.</li> </ol> <p>The utility of various model organisms such as bacteria, yeast, fungi, worms, flies, plants and animals will be discussed at different points during the course.</p>
Evaluation /assessment	<p>End-Sem Examination-40%</p> <p>Mid-Sem Examination-40%</p> <p>Others-10% + 10%</p> <p>Quizzes or assignments%</p>

Suggested readings (with full list of authors, publisher, year, edn etc.)	Introduction to Genetic Analysis by Griffiths et. al. (latest edition) Principles of Genetics by Gardner et. al. (latest edition) Review and research articles provided during the course
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