Name of the Programme: M.Sc. Biotechnology

Course Code: GBT-509

Title of the Course: LAB IV: GENETICS AND MOLECULAR BIOLOGY

Number of Credits: 2

Effective from AY: 2022-23

<table>
<tr><td>Pre-requisites for the Course:</td><td colspan="2">None</td></tr>
<tr><td>Course Objectives:</td><td colspan="2">The objective of this course is
1)to provide students with experimental knowledge of molecular biology and genetic engineering.
2) understand the concept of mutation and gene transfer processes</td></tr>
<tr><td rowspan="2">Content:</td><td>No. of hours</td><td></td></tr>
<tr><td>1. UV/Chemical mutagenesis and survival curve.
2. Isolation of amino acid auxotroph by replica plating.
3. Phage infection and burst size; types of plaque formation
4. Transduction
5. Genetic Transfer-Conjugation, gene mapping.
6. Genomic DNA isolation</td><td>30</td></tr>
<tr><td></td><td>7. DNA quantification and gel electrophoresis
8. RNA isolation
9. RNA denaturing gel electrophoresis.
10. Mitosis.
11. Meiosis</td><td>30</td></tr>
<tr><td>Pedagogy:</td><td colspan="2">Hands-on experiments in the laboratory, video, online data</td></tr>
<tr><td>References/ Readings:</td><td colspan="2">1. R.K. Sharma and S.P.S Sangha, Basic Techniques in Biochemistry and Molecular Biology Dream Tech Press, 2020.
2. S. K. Gakhar, M. Miglani and A Kumar, Molecular Biology: A Laboratory Manual. Rupa Publications, 2019.
3. Hofmann, Wilson and Walkers Principles and Techniques Of Biochemistry And Molecular Biology, Cambridge University Press, 2018.
4. R. Green and J. Sambrook, Molecular Cloning: A Laboratory Manual (Fourth Edition): Three-volume set, 2012.
5. S. John Vennison, Laboratory Manual for Genetic Engineering 1st Edition, PHI Learning, 2009.</td></tr>
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Course Outcomes:	Students will be able to 1. create mutants using mutagenesis and screen them 2. Purify and check DNA quality for molecular biology experiments. 3. Understand the concept of phage titre and screen phage infection 4. Understand the various stages of cell division

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