

# **ST. JOSEPH'S COLLEGE (AUTONOMOUS)**

**BENGALURU-27**



Re-accredited with 'A++' GRADE with 3.79/4 CGPA by NAAC  
Recognized by UGC as College of Excellence

## **DEPARTMENT OF MICROBIOLOGY**

### **SYLLABUS FOR CERTIFICATE COURSES OFFERED**

**Principles of Genetic Engineering (UGC approved)**

<b>Certificate Course</b>	<b>Principles of Genetic Engineering (UGC approved)</b>
<b>Offered by</b>	Dept. of Microbiology, St. Joseph's College (Autonomous)
<b>Course coordinator</b>	Dr. Syed Wajeed, Associate Professor, Dept. of Microbiology, St. Joseph's College (Autonomous), Bengaluru.
<b>Contact email ID</b>	<a href="mailto:wajeed@sjc.ac.in">wajeed@sjc.ac.in</a>
<b>Course Duration</b>	90 hours
<b>Credits</b>	3
<b>Course Fee</b>	Rs. 5000/- (Rupees Five thousand only)
<b>Course Objective</b>	<ul style="list-style-type: none"> <li>Empowering students with the basic skills and knowledge required to clone genes, express them in unnatural hosts and purification of the expressed proteins product by chromatographic techniques.</li> </ul>
<b>Content</b>	<p>The course consists of both theory and practical modules. Emphasis is laid more on the practical aspects. Theory and practical modules are dealt in a methodical way.</p> <p>The Theoretical component, protocols of the experiments and data interpretation will be dealt by virtual mode to begin with. Practical Classes will be carried out once the regular offline classes resumes.</p> <p style="text-align: center;"><b>THEORY</b></p> <p><b>Module I</b> Concepts and scope of genetic engineering</p> <p><b>Module II</b> Purification and quantification of Genomic and Plasmid DNA from living cells.</p> <p><b>Module III</b> Vectors in gene cloning</p> <p><b>Module IV</b> DNA manipulative enzymes</p> <p><b>Module V</b> PCR: Process, Primer designing, PCR types and its applications.</p> <p><b>Module VI</b> DNA fingerprinting</p> <p><b>Module VI</b> Transformation techniques</p> <p><b>Module VII</b> Expression and purification of cloned genes by affinity chromatography</p>

## **PRACTICALS**

- 1) Preparation and analysis of genomic DNA from bacteria.**
- 2) Preparation and analysis of plasmid DNA from bacteria.**
- 3) Estimation of purified DNA by UV-Spectrophotometry.**
- 4) Restriction digestion of purified plasmid DNA.**
- 5) Ligation of Vector DNA with gene of interest.**
- 6) Invitro amplification of DNA by polymerase chain reaction.**
- 7) Calcium chloride mediated gene transfer in bacteria.**
- 8) Blotting**
- 9) DNA fingerprinting**
- 10) Protein purification by affinity Chromatography**

