

Name of the Programme: M. Sc (Botany)

Course Code: BOT-522

Title of the Course: Lab in Plant Biotechnology.

Number of Credits: 1 (30 hours)

Effective from AY: 2022-23

|   |  |  |
|---|--|--|
| <b><u>Prerequisites for the course:</u></b> | Practical knowledge of Plant Biotechnology.  |  |
| <b><u>Objective(s):</u></b>                 | To train the students in practical aspects of plant biotechnology with special emphasis on somatic embryogenesis and organogenesis.  |  |
| <b><u>Content:</u></b>                      | <ol style="list-style-type: none"><li>1. Familiarizing with various physical and chemical sterilization techniques.</li><li>2. Preparation Murashige and Skoog (MS) Media.</li><li>3. Preparation of explants and inoculation.</li><li>4. Leaf and node culture.</li><li>5. Stem culture.</li><li>6. <i>In vitro</i> embryo culture of <i>Pisum sativum</i>.</li><li>7. Seed culture.</li><li>8. Anther culture using Datura flower.</li><li>9. Preparation of cell suspension cultures.</li><li>10. Study of cell viability methods.</li><li>11. Isolation of protoplast from plant leaves by enzymatic method.</li><li>12. Isolation of protoplast from plant leaf by mechanical method.</li><li>13. Study of protoplast viability.</li><li>14. Root organ culture (ROC) technique.</li><li>15. Preparation of synthetic seeds (alginate beads).</li></ol> <p><b><i>Only 30 hours for any of the above practicals will be conducted depending on availability of material, chemicals, equipments, etc.</i></b></p> | <b>2 hours</b><br><b>4 hours</b><br><b>2 hours</b><br><b>2 hours</b><br><b>2 hours</b><br><b>2 hours</b><br><b>2 hours</b><br><b>2 hours</b><br><b>2 hours</b><br><b>4 hours</b><br><b>2 hours</b><br><b>4 hours</b><br><b>4 hours</b><br><b>4 hours</b><br><b>2 hours</b><br><b>4 hours</b><br><b>2 hours</b> |
| <b><u>Pedagogy:</u></b>                     | Laboratory Practical.  |  |
| <b><u>References/ Readings:</u></b>         | <p><b>Aguilar Cristobel Noe</b> (2008). Food Science and Food Biotechnology in Developing countries. Asiatech Publishers Inc.</p> <p><b>Bhavneet Kaur, et al.</b> (2008). Current Topics in Biotechnology. M.D. Publications, New Delhi.</p> <p><b>Bhojwani, S.S. and Razdan, M.K.</b> (1997). Plant Tissue Culture: Theory and Practice. Springer Publishers Netherlands.</p>   |  |

|   |  |  |
|---|--|--|
|   | <p><b>Dubey, R.C.</b> (2009). A text book of Biotechnology. S. Chand &amp; Co. Ltd. New Delhi.</p> <p><b>Gautam, H.</b> (2006). Agricultural &amp; Industrial Applications of Biotechnology. Rajat Publication.</p> <p><b>Harikumar, V.S.</b> (2006). Advances in Agricultural Biotechnology. Regency Publishers.</p> <p><b>Kumar, H.D.</b> (2005). Agricultural Biotechnology. Daya Publishing House.</p> <p><b>Rajmohan Joshi</b> (2006). Agricultural Biotechnology. Gyan Books.</p> <p><b>Park, S.</b> (2021). Plant Tissue Culture: Techniques and Experiments. Academic Press.</p> <p><b>Prasad</b> (2008). Biotechnology in Sustainable Biodiversity and Food Security. India Book House Limited.</p> <p><b>Vibha Dhawan</b> (2008). Biotechnology for Food and Nutritional Security. Teri Press.</p> |  |
| <p><b><u>Learning Outcomes:</u></b></p> | <p>Able to work in Plant tissue culture laboratory, in Pharmaceutical and ayurvedic drug industries, research laboratories and plant germplasm banks.</p>  |  |