[A-3]COURSE SYLLABUS

1. Course Description (Approximately 100 words)

This course enables students to understand structure, growth and function of plant and animal cells, the technology involved in cell and tissue culture, cell preservation, protoplast culture and fusion, cell cloning and fusion, monoclonal antibody production, breeding and genetic engineering. Applications of stem cells for agriculture and therapeutic purposes.

2. Course Goals and Objectives (Approximately 100 words)

By the end of this course, students will be able to:
1. Understand plant forms and functions.
2.Be able to monitor plant growth and development.
3.Know techniques in plant biotechnology for cell and tissue culture, in vitroconservation, protoplast culture, micropropagation and genetic engineering.
4. Understand terminologies on animal cell cultivation.
5. Describe the differences between primary vs continuous culture, normal cells vs transformed cells, monolayer vs suspension culture.
6. Explain how to set up and maintain animal cells in in vitro culture.
7. Describe the use of cell cultures in the production of biologicals.
8. Explain certain technologies such as monoclonal antibody production, production of genetically engineered cells and their applications.

3. Textbook (Title, Author, Publisher, Year of Publication, etc.)

Plant Cell and Tissue Culture - A Tool in Biotechnology: Basics and Application (Principles and Practice) by Karl-Hermann Neumann (Author), Ashwani Kumar (Author), Jafargholi Imani (Author)

Plant Tissue Culture, Third Edition: Techniques and Experiments 3rd Edition by Roberta H. Smith (Author)

4. Reference

Plant Tissue Culture: Techniques and Experiments 3rd , Kindle Edition by Roberta H. Smith (Author)

5. Course Requirements and Grades

EXAMINATION = 100%

6. Course Calendar

Week	Main Content
1	Plant celll and tissue culture
2	Methods of sterilization
3	Micropropagation
4	Approaches to Micro propagation
5	Direct and indirect organogenesis
6	Callus and Suspension Cultures
7	Protoplasts
8	Hybrid Cells
9	Production of Haploid Plants
10	Gynogenesis
11	Somaclonal variation in plants
12	Somaclonal variation in plants II
13	Revision
14	EXAMINATION