

Course Title:				<u>Animal Cell Culture</u>				
Course Code:				<u>BTL 6191</u>				
Course Coordinator				<u>VINOD SINGH</u>				
Credits				<u>2-0-0</u>				
Evaluation Scheme Total 100 Marks								
Quiz (Total 20 Marks)				Assignment/Project (Total 20 marks) (Minimum Two Assignments or one Project)		Mid-Term	Major Examination	Total
Quiz I (5 marks)	Quiz II (5 marks)	Quiz III (5 marks)	Quiz IV (5 marks)			20 marks) (1 ½ Hour Duration)	(40 marks) (3 Hour Duration)	100 Marks
WEEKS				TOPICS TO BE COVERED				
Week 1				Introduction: Historical background, advantages and limitation of tissue culture.				
Week 2				Biology of cultured cells				
Week 3				Different equipment used in cell culture laboratory; Culture vessels and substrates.				
Week 4				Aseptic technique: objectives, elements of aseptic environment, sterile handling, standard procedures, apparatus and equipment.				
Week 5				Cell culture media and supplements: physicochemical properties, role of CO₂ in cell culture, balanced salt solutions, complete media.				
Week 6				Importance of serum and serum-free media, adaptation to serum free media.				
Week 7				Primary and cell line cultures: Tissue disaggregation and primary culture establishment.				
Week 8				Subculture and cell lines: difference between cell line and strain, cell line designations, maintenance and subculturing cell culture.				
Week 9				Cell cloning and separation methods				
Week 10				Contamination types, detection and removal; Cryopreservation and transportation of cells.				
Week 11 (17th -21st March, 2025)				Mid-Term				
2nd May, 2025				Showing of Mid-Term Answer Sheets				

Week 12	Measurement of growth and viability of cells in culture; Cells transformation, cell immobilization and cell synchronization.
Week 13	Scale up methods for propagation of anchorage dependent and suspension cell culture.
Week 14	Scale up methods for propagation of anchorage dependent and suspension cell culture.
Week 15	Stem cell cultures, embryonic stem cells, induced pluripotent stem cells and their applications.
Week 16	Cell micromanipulation, animal and human cloning. Organ and histotypic cultures.
Week 17 (5 th -9 th May, 2025)	Revision Week
Week 18 (13 th – 22 nd May, 2025)	Major Examinations
29 th May, 2025	Showing of Major Exams Answer Sheets

Course Outcomes: After successful completion of this course, students will be able to

CO1: Understand the advantages and limitations of tissue culture, the biology of cultured cells; describe the laboratory requirements for cell culture; apply the aseptic technique necessary for performing animal cell culture

CO2: Understand the physicochemical properties and components of the animal cell culture media.

CO3: Demonstrate knowledge of primary cell culture establishment, cell culture maintenance and the general cell culture techniques.

CO4: Describe the scale up methods and applications of animal cell culture.

Recommended Books:

1. Culture of Animal cells, 6th Edition, R. Ian Freshney. Wiley-Blackwell publications.
2. Animal Cell Culture- Practical Approach, 3rd Edition, John R.W. Masters, Oxford University Press.
3. Animal Cell Culture Techniques. Ed. Martin Clynes, Springer.
4. Animal Cell Biotechnology, Methods and protocols, Nigel Jenkins, Humana Press.

Calendar of Quizzes/Assignment:

Component	Date
Quiz-I	27 th -31 st , January 2025
Quiz-II	24 th -28 th February, 2025

Assignment-I	10th -12th February, 2025
Mid-Term	17-21st March, 2025
Assignment-II/Project Submission	21st – 24th April, 2025
Quiz-III	7th – 11th April, 2025
Quiz-IV	28th April-2nd, May, 2025
Major Exam	13th – 22nd May, 2025

Note: One surprise Quiz may be fixed out of Quiz-II, Quiz-III or Quiz-IV.

Signature of Course Coordinator :