

Branch Name:	B.Sc. Biotechnology
ProgramCode:	SC101
CourseName:	Animal Biotechnology
CourseCode:	2SC1010603
Pre-requisiteCourse:	Molecular Biology

Course Objectives:

- This course is helps to acquire Basic knowledge of animal cell culture laboratory requirements.
- It will also help in enriched with the knowledge of tissue culture technique, cell lines, preservation of cells.
- It will also provide knowledge of organ culturing, stem cell biology, IVF and Embryo Technology.
- It will also aid in getting knowledge of transgenic animals and its applications.

Teaching and Examination Scheme:

Teaching Scheme (Hours per week)				Evaluation Scheme (Marks)				
Lecture (L)	Tutorial (T)	Practical (P)	Credit	Theory (Marks)		Practical (Marks)		Total (Marks)
				University Assessment	Continuous Assessment	University Assessment	Continuous Assessment	
3	--	--	3	70	30	--	--	100

Subject Contents:

Sr. No	Topic	Total Hours	Weightage (%)
1	1. Introduction – History and scope of Animal Cell Culture 2. Various types of substrates used for Adhesive and Non-adhesive Animal Cell 3. Media – Different types of media (serum based as well as Non-serum based), role and importance of various components used in the media 4. Reproduction of cells – various methods of tissue disaggregation, primary culture, subculture, secondary culture, cell line – Finite, contact inhibition and continuous 5. Conservation of cell line – Cryopreservation 6. Bioreactor, various types and its importance	15	34%
2	1. Organ culture, different approaches and importance 2. Stem Cells – Introduction, various types of stem cells and its applications 3. Vaccines, different types of vaccines 4. Antibody, Types of antibody, production of monoclonal antibody 5. IVF, Embryo technology – Introduction, embryo transfer and applications	15	33%
3	Transgenic Animals 1. Animal Cloning – Dolly sheep 2. Various strategies of transgenesis 3. Studying human disease using transgenic mice 4. Meat and organ development using transgenic pig 5. Production of Therapeutic protein, milk, wool using transgenic cattle, sheep and goat	15	33%

Text Books: Elements of Biotechnology : P.K. Gupta

Reference Books: • Molecular biotechnology : Bernard, R. Glick and Pasternak.

• Jan Freshney. R .Culture of Animal Cells: A Manual of Basic Technique and Specialized Applications (6th Ed.) Wiley & Sons. 2010.

• John Davis., Animal Cell Culture: Essential Methods (1st Ed.) Wiley-Blackwell and Sons publisher. 2011

• Biotechnology: U. Satyanarayana

• Brown, T.A. (1998). Molecular biology Labfax II: Gene analysis. II Edition. Academic Press, California,USA.

• Butler, M. (2004). Animal cell culture and technology: The basics. II Edition. Bios scientific publishers.

John Davis., Animal Cell Culture: Essential Methods (1st Ed.) Wiley-Blackwell and Sons publisher. 2011 •

Biotechnology: U. Satyanarayana • Brown, T.A. (1998). Molecular biology Labfax II: Gene analysis. II Edition.

Academic Press, California,USA. • Butler, M. (2004). Animal cell culture and technology: The basics. II Edition. Bios scientific publishers.

List of Open Source Software/learning website: <https://www.youtube.com/watch?v=HNOcQKwW5ks>

Course Learning Outcomes (CLO): On completion of this course, the students will be able to:

CLO	Description	Bloom's Taxonomy Level
CLO1	Discuss the mechanism Tissue collection, tissue disaggregation, IVF and Embryo transfer.	2 Understanding
CLO2	List the types of media, different types of substrates	1 Remembering
CLO3	Enabling students to understand types, advantages and disadvantages of stem cells, vaccines, etc.	2 Understanding,
CLO4	Understand organ culture and bioreactor	3 Applying, 2 Understanding
CLO5	Learn about transgenic animals and their applications	5,3, 4 Evaluate,Applying, Analyze
CLO6	Discuss the mechanisms involved in IVF and Embryo transfer.	6 Creating

Mapping of CLOs with POs & PSOs

Course Learning Outcomes	Program Outcomes (POs)												Program Specific Outcomes (PSOs)		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CLO1	H	H	M	M	H	H	H	M	H		L	H	M	M	H
CLO2	M	M			L	H	H	H	L		M			L	
CLO3	M	H	M				M	M	H	L		H	L		M
CLO4	H	H	L	M	H			L	M	M	H	L	M	M	
CLO5	M	L	M	M	M	H	L	M		M	H	H	M	M	H
CLO6	M	M	M		M	M	L	M	M	L	H	M			M

H:High, M:Medium, L:Low