

SARDAR PATEL UNIVERSITY
Programme: MSc (Zoology)
Semester: IV
Syllabus with effect from: June 2011

Paper Code: PS04CZOO02	Total Credits: 4
Title Of Paper: Animal Biotechnology	

Unit	Description in detail	Weightage (%)
1	Structure and organization of animal cells, tissues and biology of cultured cells. General out-line of epithelial tissue, connective tissue, muscular tissue and nerve tissue. Cell adhesion; Junctions; Extracellular matrix; Cytoskeleton; Cell cycle; Differentiation; Cell signaling; Energy metabolism.	
2	Equipments and materials for animal cell culture technology. Aseptic conditions and requirement of equipment; Incubation; Storage; Different substrates. Introduction to the balanced salt solutions and growth medium: Media –Physical properties, balance salt solutions, complete media, serum Serum-Free media: Chemical, physical and metabolic functions of different constituents of culture medium. Role of carbon dioxide. Role of serum and supplements. Serum and protein free media and their application.	
3	Primary and established cell line culture. Measurement of viability and cytotoxicity. Biology; Characterization and growth of the cultured cells; Disaggregation of tissue and primary culture; Maintenance of cell culture; Cell cloning and cell separation; Cell differentiation; Cell synchronization and transformation; Measurement of cell death and apoptosis.	
4	Basic techniques of mammalian cell culture in vitro. Culture of specialized cells: Epithelia; Mesenchymal and connective tissues; Muscles; Neuroectoderm; Endocrine; Hematopoietic cells; Tumor cells	
5	Embryonic stem cells, stem cell culture and their applications. Embryo technology and transgenic animals.	

Basic Text & Reference Books:

- Freshney, R. I: Culture of Animal Cells. Wiley-Liss.
- Masters, J. R. W. (Ed): Animal Cell Culture – Practical Approach, Oxford Univ. Press.
- Basega, R. (Ed): Cell Growth and Division: A Practical Approach. IRL Press.
- Butler, M and Dawson, M. (Eds.). Cell Culture Lab Fax, Eds., Bios Scientific Publications Ltd., Oxford.
- Clynes, M. (ed):. Animal Cell Culture Techniques. Springer.
- Mather, J.P and Barnes, D. (eds). : Methods in Cell Biology, Vol. 57, Animal Cell Culture Methods. Academic Press.

