



Course Outline Form

EVEN SEMESTER 2019

Dear Student: Course outlines are intended to provide students with an overall plan for a course to enable them to function efficiently and effectively in the course.

*Academic Programs
BSc Biotechnology
EMEA College
Kondotty*

Course Outline : **BTY6B14. ANIMAL BIOTECHNOLOGY** (2018-2019)

Name of the Stream	Science
Name of the Programme	BSc Biotechnology
Name of the Course	BTY6B14. ANIMAL BIOTECHNOLOGY
Nature of the Course	Core Course
Semester	Sixth
Lecturer(s)	Shilly Das.A
Name of the Coordinator	Shilly Das.A
Year	2018-2019
No of Credits	3
No of Contact Hours	3
Course Description	Animal biotechnology is the use of science and engineering to modify living organisms. The course helps to make products, to improve animals and to develop microorganisms for specific agricultural uses. Biotechnology can improve an animal's impact on the environment and biotechnology enhances the ability to detect, treat and prevent diseases
Course Objectives	To identify and characterise of animal breeds To develop DNA - based diagnostics and genetically engineered vaccines for animals To Study animal genomics and its varied applications To develop embryo - transfer technology, cloning, transgenic animals DNA forensics, molecular diagnostics, cloning, wildlife conservation, stem cell research and bio - processing technologies are other import areas of animal biotechnology.
Course Outcome	Animal biotechnology has diverse and widespread applications in the areas of food quality control, analyses of milk and milk products and other animal products, besides development of disease – free animals. Transgenic technology Gene knockout technology Molecular genetics Embryo transfer technique In vitro embryo production Modern vaccines Molecular diagnostics Nutritional biotechnology
Assessment Method	Assignments Class Tests Unit Tests Practical Tests Term Exam Seminars Lab Experiments
Teaching Methods Used	
Textbook	Culture of Animal cells, 3rd Edition, R. Ian Freshney. A John Wiley & Sons, Inc., publications. Animal Cell Culture-Practical Approach, R.W. Masters, Oxford. Animal Cell Culture Techniques. Ed. Martin Clynes, Springer.

References	<ol style="list-style-type: none"> 1. Culture of Animal cells, 3rd Edition, R. Ian Freshney. A John Wiley & Sons, Inc., publications. 2. Animal Cell Culture-Practical Approach, R.W. Masters, Oxford. Animal Cell Culture Techniques. Ed. Martin Clynes, Springer. 3. Animal Cell Biotechnology, Methods and protocols, Nigel Jenkins, Humana Press. 4. Biotechnology of Animal Tissue. P.R. Yadav & Rajiv Tyagi. 2006. Discovery Publishing House. New Delhi 5. From Genes to Clones Introduction to Gene Technology -Winnacker, E.L.1987., Panima Educational Book Agency, New Delhi 6. Gene VII -Benjamin Lewin, 2000. Oxford University Press, UK. 6. Biotechnology, Satyanarayana. U, (2008), Books and Allied (p) Ltd.
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Internet Resources	
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Internal Exam Pattern

Items	Marks/20	Marks/15
Assignment	4	3
Test Paper(s)/Viva voce	8	6
Seminar/Presentation	4	3
Class Room Participation based on Attendance	4	3
Total	20	15

External Exam Pattern

Question Type	No of Question	Marks/Question	Total Marks
Short Questions(2-3 Sentences)	15	2	Ceiling 25
Paragraph / Problem Type	8	5	Ceiling 35
Essay Type	2 out of 4	10	20
Total			80
Time			2.5 hrs

Graduate Attributes	Name of the Course: BTY6B14. ANIMAL BIOTECHNOLOGY
	Knowledge
	Academic and Intellectual Skills
	Self Learning
	Collaborative Learning
	Professional Skills
	Communication Skills
	Team Work and Leadership
	Decision Making
	Problem Solving Skills
Research Skills	
Personal Skills	
Application Skills	
Attitude and Values	
Ethical Commitment	

Course Schedule

Introduction to animal cell culture: Lab Design and equipments. Sterile area, Laminar flow hood.	Week 1
CO2 incubator. Cryostorage (liquid Nitrogen flask), refrigerated centrifuges freezers (-800C) inverted microscope,	Week 2
Hemocytometer, pH meter,	Week 3
magnetic stirrer, micropipettes and pipetteaid. .	Week 4
Media preparation ,Unit test 1	Week 5
sterilization: Sterilization of glass wares: Reagents: Balanced salt solutions	Week 6
preparation stock of solutions such as amino acids, vitamins, salts, glucose, Hormones and growth factors, antibiotics,	Week 7
role of serum in media,	Week 8
physicochemical properties, - CO2 and bicarbonate, oxygen, osmolality, Temperature, viscosity, filter sterilizationofmedia. Brief discussion on the chemical, physical and metabolic functions of different constituents of culture medium.	Week 9
Primary culture: Mouse embryo cell culture, protocol for Isolation of mouse embryo,	Week 10
Primary explants,	Week 11
Enzymatic disaggregation, warm and cold trypsin treatment	Week 12
collagenase treatment, mechanical disaggregation and sieving separation of viable andnon-viablecells. Secondary cell culture.	Week 13
Cell lines	Week 14
Cryopreservation: Immortalization of cell lines with viral genes - SV. 40, papillomavirus, Epstein-Barr virus,	Week 15
fibroblast immortalisation, cell line designations maintenance of cell lines, cell morphology, criteria for subculture. States of Cryopreservation, freezing a cells, Thawing of frozen cells. Scaling –up of animal cell culture, Cell synchronization. Cell cloning, micromanipulation and types of cloning.	Week 16
Cell transformation. Application of animal cell culture Cytotoxicity: Estimation of viability by Dye exclusion	Week 17
cell proliferation assays, MTT-based cytotoxicity assay.	Week 18

Contact Details

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