

Semester Lecture Plan

Name of College: Government College of Arts, Science & Commerce, Sanquelim Goa							
Name of Faculty: Dr. Vaibhav Chindarkar			Subject: Zoology				
Paper code: ZOD 104 Animal Biotechnology			Program/Course: T.Y. B.Sc.			Division: A	
Academic year: 2024-2025			Semester: VI			Total Lectures: 45	
Course Objectives: To provide students with theoretical and practical understanding of animal biotechnology.							
Course Learning Outcome: On completion of this course, the learner will be able to:							
- Explain and explore the basics of microbiology and demonstrate skills in basic microbiology techniques. (K, U, Ap) - Discuss and analyse the steps, and requirements of recombinant DNA technology including gene cloning vectors, enzymes. (K, U, An) - Explain and analyse the various gene cloning strategies and transformation techniques (K, U, An) - Evaluate the various applications in the field of Animal Biotechnology and demonstrate the skills to use the basic experimental tools in molecular biology. (U, Ap, Ev)							
Month	Lectures From: To:		No. of lectures allotted	Topic, Subtopic to be covered	Exerci se/ Assign ment	ICT Tools	Reference books
Decembe r	9/12/24	14/12/24	3	Introduction to Biotechnology- Concept, History		Power point presentation, lecture	●Brown, T. A. (1990) Gene Cloning an Introduction, VNR International Publ. ●Dubey and Maheswari (2007) Practical Microbiology, S. Chand & Co. Ltd.
				Importance and Scope of Biotechnology			
				Importance and Scope of Biotechnology contd.....			

							• Dubey, R. C. (2014) A textbook of Biotechnology, 5th Ed. S. Chand & Co. Pvt. Ltd. New Delhi • Ranga, M. M., (1999) Animal Biotechnology, Agrobios Publ. New Delhi - Singh, B. D., (2010) Biotechnology, 3rd Ed., Kalyani Publ. Calcutta
December	16/12/24	21/12/24	3	Microbiology Introduction		Power point presentation	• Brown, T. A. (1990) Gene Cloning an Introduction, VNR International Publ. • Dubey and Maheswari (2007) Practical Microbiology, S. Chand & Co. Ltd. • Dubey, R. C. (2014) A textbook of Biotechnology, 5th Ed. S. Chand & Co. Pvt. Ltd. New Delhi • Ranga, M. M., (1999) Animal Biotechnology, Agrobios Publ. New Delhi - Singh, B. D., (2010) Biotechnology, 3rd Ed., Kalyani Publ. Calcutta
				Classification of Bacteria Structure of Bacteria			
				Nutritional requirements			
January	2/01/25	4/01/25	3	Molecular techniques in Gene manipulation - Introduction		Power point presentation	• Brown, T. A. (1990) Gene Cloning an Introduction, VNR International Publ. • Dubey and Maheswari (2007) Practical Microbiology, S. Chand & Co. Ltd. • Dubey, R. C. (2014) A textbook of Biotechnology, 5th Ed. S. Chand & Co. Pvt. Ltd. New Delhi • Ranga, M. M., (1999) Animal Biotechnology, Agrobios Publ. New Delhi - Singh, B. D., (2010) Biotechnology, 3rd Ed., Kalyani Publ. Calcutta
				Cloning vectors			
				Plasmids- Introduction			
	6/01/25	11/01/25	3	Cosmids, Phagemids		Power point presentation	• Brown, T. A. (1990) Gene Cloning an Introduction, VNR International Publ. • Dubey and Maheswari (2007) Practical Microbiology, S. Chand & Co. Ltd. • Dubey, R. C. (2014) A textbook of Biotechnology, 5th Ed. S. Chand & Co. Pvt. Ltd. New Delhi • Ranga, M. M., (1999) Animal Biotechnology, Agrobios Publ. New Delhi - Singh, B. D., (2010) Biotechnology, 3rd Ed., Kalyani Publ. Calcutta
				Shuttle Vectors			
				Lambda Bacteriophage, M13			

							• Ranga, M. M., (1999) Animal Biotechnology, Agrobios Publ. New Delhi - Singh, B. D., (2010) Biotechnology, 3rd Ed., Kalyani Publ. Calcutta
				Construction of genomic and cDNA libraries		Power point presentation	• Brown, T. A. (1990) Gene Cloning an Introduction, VNR International Publ. • Dubey and Maheswari (2007) Practical Microbiology, S. Chand & Co. Ltd. • Dubey, R. C. (2014) A textbook of Biotechnology, 5th Ed. S. Chand & Co. Pvt. Ltd. New Delhi • Ranga, M. M., (1999) Animal Biotechnology, Agrobios Publ. New Delhi - Singh, B. D., (2010) Biotechnology, 3rd Ed., Kalyani Publ. Calcutta
				Screening by colony and plaque hybridization			
Feb 2025	10/02/25	15/02/25	3	Screening by colony and plaque hybridization contd...		Power point presentation	• Brown, T. A. (1990) Gene Cloning an Introduction, VNR International Publ. • Dubey and Maheswari (2007) Practical Microbiology, S. Chand & Co. Ltd. • Dubey, R. C. (2014) A textbook of Biotechnology, 5th Ed. S. Chand & Co. Pvt. Ltd. New Delhi • Ranga, M. M., (1999) Animal Biotechnology, Agrobios Publ. New Delhi - Singh, B. D., (2010) Biotechnology, 3rd Ed., Kalyani Publ. Calcutta
				Southern Blotting			
				Northern Blotting,			
Feb 2025	17/02/25	22/02/25	3	Western blotting		Power point presentation	• Brown, T. A. (1990) Gene Cloning an Introduction, VNR International Publ. • Dubey and Maheswari (2007) Practical Microbiology, S. Chand & Co. Ltd. • Dubey, R. C. (2014) A textbook of Biotechnology, 5th Ed. S. Chand & Co. Pvt. Ltd. New Delhi • Ranga, M. M., (1999) Animal Biotechnology, Agrobios Publ. New Delhi - Singh, B. D., (2010) Biotechnology, 3rd Ed., Kalyani Publ. Calcutta
				DNA sequencing- Introduction			
				Sanger method Polymerase Chain Reaction			

Feb/ March 2025	24/02/25	1/03/25	3	DNA Finger Printing and DNA micro array		Power point presentation	• Brown, T. A. (1990) Gene Cloning an Introduction, VNR International Publ. • Dubey and Maheswari (2007) Practical Microbiology, S. Chand & Co. Ltd. • Dubey, R. C. (2014) A textbook of Biotechnology, 5th Ed. S. Chand & Co. Pvt. Ltd. New Delhi • Ranga, M. M., (1999) Animal Biotechnology, Agrobios Publ. New Delhi - Singh, B. D., (2010) Biotechnology, 3rd Ed., Kalyani Publ. Calcutta
				Genetically Modified Organisms: Introduction			
				GMOs continued.....			
	3/03/25	8/03/25	3	Production of cloned and transgenic animals, nuclear transplantation		Power point presentation	• Brown, T. A. (1990) Gene Cloning an Introduction, VNR International Publ. • Dubey and Maheswari (2007) Practical Microbiology, S. Chand & Co. Ltd. • Dubey, R. C. (2014) A textbook of Biotechnology, 5th Ed. S. Chand & Co. Pvt. Ltd. New Delhi • Ranga, M. M., (1999) Animal Biotechnology, Agrobios Publ. New Delhi - Singh, B. D., (2010) Biotechnology, 3rd Ed., Kalyani Publ. Calcutta
				Nuclear Transplantation			
				Retroviral Method			
March 2025	10/03/25	15/03/25	3	DNA microinjection		Power point presentation	• Brown, T. A. (1990) Gene Cloning an Introduction, VNR International Publ. • Dubey and Maheswari (2007) Practical Microbiology, S. Chand & Co. Ltd. • Dubey, R. C. (2014) A textbook of Biotechnology, 5th Ed. S. Chand & Co. Pvt. Ltd. New Delhi • Ranga, M. M., (1999) Animal Biotechnology, Agrobios Publ. New Delhi - Singh, B. D., (2010) Biotechnology, 3rd Ed., Kalyani Publ. Calcutta
				Applications of transgenic animals			
				Applications of transgenic animals...contd...			
March 2025	17/03/25	22/03/25	3	Production of pharmaceuticals		Power point presentation	• Brown, T. A. (1990) Gene Cloning an Introduction, VNR International Publ. • Dubey and Maheswari (2007) Practical Microbiology, S. Chand & Co. Ltd. • Dubey, R. C. (2014) A textbook of Biotechnology, 5th Ed. S. Chand & Co. Pvt. Ltd. New Delhi
				Production of donor organs			
				Production of donor organs contd....			

							• Ranga, M. M., (1999) Animal Biotechnology, Agrobios Publ. New Delhi - Singh, B. D., (2010) Biotechnology, 3rd Ed., Kalyani Publ. Calcutta
	24/03/2025	29/03/2025	3	knockout mice		Power point presentation	• Brown, T. A. (1990) Gene Cloning an Introduction, VNR International Publ. • Dubey and Maheswari (2007) Practical Microbiology, S. Chand & Co. Ltd. • Dubey, R. C. (2014) A textbook of Biotechnology, 5th Ed. S. Chand & Co. Pvt. Ltd. New Delhi • Ranga, M. M., (1999) Animal Biotechnology, Agrobios Publ. New Delhi - Singh, B. D., (2010) Biotechnology, 3rd Ed., Kalyani Publ. Calcutta
				knockout mice			
				Knock out mice applications			
				Revision			
				Revision			
March/ April 2025	31/03/2025	05/03/2025	3				
				Future scope			
	7/04/25	11/04/25	3	Discussion			
				Question paper pattern			
April 2025							

*** Assessment Rubrics**

Component	Max Marks
ISA 1	8
ISA 2	7
Practical	25
Semester End Exam	60

