

Lecture Plan		
Name of the College: Government College of Arts, Science and Commerce. Sanquelim - Goa		
Name of Faculty: Ms Aishwarya Anil Nene	Subject: Zoology	
Paper code: ZOO 221 (Bioinstrumentation)	Program: S.Y.B.Sc	Division: A
Academic year: 2024-25	Semester: IV	Total Lectures:30
Course Objectives: 1.Understanding the principles, working mechanisms. 2. Applications of various Bio-instruments. 3. Familiarising the principles, operation, and applications of Imaging, separation and spectrophotometric techniques 4. Imparting hands-on experience with instruments.		
Course Outcome: At the end of this course, students will be able to 1. Understand the importance of instrumentation in biological research. 2. Explain the principles and applications of spectroscopic techniques and microscopy. 3. Apply a range of spectroscopic, chromatographic, electrophoretic, and microscopic techniques to analyze and characterize biomolecules, demonstrating a foundation in bioanalytical methods. 4. Critically evaluate experimental setups, troubleshoot potential issues, and adapt bioinstrumentation techniques to address specific research questions.		
Student Learning Outcome: After the completion of this course students will be able to understand the working principles of various lab instruments and get an hands-on experience with instruments. They will also understand the significance of these instruments in various research work.		

Month	Lecture From	Lecture To	No. of lectures allotted	Topic, Subtopic to be covered	Exercise/ Assignment	ICT Tools	Reference books
December	9/12/24	14/12/24	1	Principles of microscopy; Light microscopy;		Powerpoint presentation,	J.D. Enderle, Bioinstrumentation. Morgan & Claypool Publishers, 2006.
	16/12/24	21/12/24	1	Principles of microscopy; Light microscopy;		Powerpoint presentation	J.D. Enderle, Bioinstrumentation. Morgan & Claypool Publishers, 2006.
January	2/01/25	4/01/25	0	-----		Powerpoint presentation	J.D. Enderle, Bioinstrumentation. Morgan & Claypool Publishers, 2006.
	6/01/25	11/01/25	2	Principles of microscopy; fluorescence microscopy;		Powerpoint presentation	J.D. Enderle, Bioinstrumentation. Morgan & Claypool Publishers, 2006.
	13/01/25	18/01/25	2	Applications of fluorescence microscopy: Chromosome banding,		Powerpoint presentation	J.D. Enderle, Bioinstrumentation. Morgan & Claypool Publishers, 2006.
	20/01/25	25/01/25	2	Flow cytometry, FISH		Powerpoint presentation	J.D. Enderle, Bioinstrumentation. Morgan & Claypool Publishers, 2006.

	27/01/25	1/02/25	2	Transmission and Scanning electron microscopy – sample preparation for electron microscopy,		Powerpoint presentation	J.D. Enderle, Bioinstrumentation. Morgan & Claypool Publishers, 2006.
February	3/02/25	8/02/25	2	cryofixation, negative staining		Powerpoint presentation	J.D. Enderle, Bioinstrumentation. Morgan & Claypool Publishers, 2006.
	10/02/25	15/02/25	2	freeze fracture, freeze etching.		Powerpoint presentation	J.D. Enderle, Bioinstrumentation. Morgan & Claypool Publishers, 2006.
	17/02/25	22/02/25	2	freeze fracture, freeze etching. pH meter: Principles and instrumentation		Powerpoint presentation	J.D. Enderle, Bioinstrumentation. Morgan & Claypool Publishers, 2006.
	24/02/25	1/03/25	2	Centrifugation: Principles, types of centrifuges		Powerpoint presentation	J.D. Enderle, Bioinstrumentation. Morgan & Claypool Publishers, 2006.
March	3/03/25	8/03/25	2	types of rotors, differential and density gradient centrifugation, application.		Powerpoint presentation	J.D. Enderle, Bioinstrumentation. Morgan & Claypool Publishers, 2006.
	10/03/25	15/03/25	2	Spectrophotometry: Principle involved in Spectrophotometer;			J.D. Enderle, Bioinstrumentation. Morgan & Claypool Publishers, 2006.

	17/03/25	22/03/25	2	Spectrophotometric techniques, Instrumentation: ultraviolet and visible spectrophotometry		Powerpoint presentation	J.D. Enderle, Bioinstrumentation. Morgan & Claypool Publishers, 2006.
	24/03/25	29/03/25	2	ultraviolet and visible spectrophotometry (single and double beam, double wavelength spectrophotometers),			J.D. Enderle, Bioinstrumentation. Morgan & Claypool Publishers, 2006.
April	31/03/25	5/04/25	0	-----		-----	-----
	7/04/25	11/04/25	2	Revision		Group discussion	-----
Assessment Rubrics	Component	Max Marks					
	ISA 1	7.5					
	ISA 2	7.5					
	Practical	25					
	Project	-					
	Semester End Exam	60					