

Lecture Plan

Name of the College: Government College of Arts, Science and Commerce. Sanquelim - Goa

Name of Faculty: Miss. Ayesha E. Shetkar

Subject: Zoology

Paper code: ZOO 141 – Skills for Zoology

Program: F.Y.B.Sc.

Division:

Academic year: 2024-25

Semester: I

Total Lectures: 15

Course Objectives:

1. Recognize skills of observation and data collection in field.
2. Develop fundamental skills required for zoological research and fieldwork.
3. Understand taxonomic methods for identifying and classifying animal species.
4. Teach protocols of handling hazardous waste, biomedical waste, and biological specimens.

Expected Course Outcome:

1. Demonstrate skills for observations of specimen in the field.
2. Use the common/ basic field and laboratory equipment.
3. Develop strategies to work effectively in 'field' and biological laboratory.
4. Plan safety protocols for 'field' and laboratory work.

Student Learning Outcome: The students will gain knowledge of the various aspects of observation, identification, handling of specimen in field & use of laboratory protocols.

Month	Lecture From	Lecture To	No. of lectures allotted	Topic, Subtopic to be covered	Exercise/ Assignment	ICT Tools	Reference books
July 2024	1st	6th	1	Topic 1: Introduction to the concept of 'field', Rationale for the need to acquire field skills and Ethics of sustainable field work.		Power point presentation	<ul style="list-style-type: none"> • Upadhyay, K. Upadhyay, and N. Nath, Biophysical Chemistry Principles & Techniques Handbook. Himalaya Publishing House, 2003. • D. M. Harmening, Laboratory Management, Principles and Processes, 3rd ed. D.H. Publishing & Consulting Inc., 2012. • I. H. Segel, Biochemical Calculations, 2nd ed. New York: John Wiley and Sons, 1997. • R. H. Linville, and H. A. Kelly, A Guide for Laboratory and Field Work in Zoology, Boston: Ginn & Co., 2019.
	8th	13th	1	Topic 2: Introduction to basic field instruments (Binoculars, Camera, Spotting-Scope, Range Finders, Hygro-thermometer, Lux meter, Anemometer)		Power point presentation	<ul style="list-style-type: none"> • Upadhyay, K. Upadhyay, and N. Nath, Biophysical Chemistry Principles & Techniques Handbook. Himalaya Publishing House, 2003. • D. M. Harmening, Laboratory Management, Principles and Processes, 3rd ed. D.H. Publishing & Consulting Inc., 2012. • I. H. Segel, Biochemical Calculations, 2nd ed. New York: John Wiley and Sons, 1997. • R. H. Linville, and H. A. Kelly, A Guide for Laboratory and Field Work in Zoology, Boston: Ginn & Co., 2019.
	15th	20th	1	Topic 3: Observational skills. Dress-code and conduct in the field, Use of taxonomic keys/ field guides/ maps		Power point presentation	<ul style="list-style-type: none"> • Upadhyay, K. Upadhyay, and N. Nath, Biophysical Chemistry Principles & Techniques Handbook. Himalaya Publishing House, 2003. • D. M. Harmening, Laboratory Management, Principles and Processes, 3rd ed. D.H. Publishing & Consulting Inc., 2012. • I. H. Segel, Biochemical Calculations, 2nd ed. New York: John Wiley and Sons, 1997. • R. H. Linville, and H. A. Kelly, A Guide for Laboratory and Field Work in Zoology, Boston: Ginn & Co., 2019.

	22	27	1	Topic 4: Animal handling, Record keeping and maintaining field diary		Power point presentation	<ul style="list-style-type: none"> • Upadhyay, K. Upadhyay, and N. Nath, Biophysical Chemistry Principles & Techniques Handbook. Himalaya Publishing House, 2003. • D. M. Harmening, Laboratory Management, Principles and Processes, 3rd ed. D.H. Publishing & Consulting Inc., 2012. • I. H. Segel, Biochemical Calculations, 2nd ed. New York: John Wiley and Sons, 1997. • R. H. Linville, and H. A. Kelly, A Guide for Laboratory and Field Work in Zoology, Boston: Ginn & Co., 2019.
	29	3 Aug	1	Topic 5: Principles and practices of Laboratory safety and conduct – Safety signages, hazards and precautions		Power point presentation	<ul style="list-style-type: none"> • Upadhyay, K. Upadhyay, and N. Nath, Biophysical Chemistry Principles & Techniques Handbook. Himalaya Publishing House, 2003. • D. M. Harmening, Laboratory Management, Principles and Processes, 3rd ed. D.H. Publishing & Consulting Inc., 2012. • I. H. Segel, Biochemical Calculations, 2nd ed. New York: John Wiley and Sons, 1997. • R. H. Linville, and H. A. Kelly, A Guide for Laboratory and Field Work in Zoology, Boston: Ginn & Co., 2019.
August 2024	5	10	1	Topic 6: Concept of Biosafety levels, Use of personal safety gears; animal/microbial, chemical and hazardous material disposal.		Power point presentation	<ul style="list-style-type: none"> • Upadhyay, K. Upadhyay, and N. Nath, Biophysical Chemistry Principles & Techniques Handbook. Himalaya Publishing House, 2003. • D. M. Harmening, Laboratory Management, Principles and Processes, 3rd ed. D.H. Publishing & Consulting Inc., 2012. • I. H. Segel, Biochemical Calculations, 2nd ed. New York: John Wiley and Sons, 1997. • R. H. Linville, and H. A. Kelly, A Guide for Laboratory and Field Work in Zoology, Boston: Ginn & Co., 2019.
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	19	24	1	Topic 7: Handling and maintaining biological specimens		Power point	<ul style="list-style-type: none"> • Upadhyay, K. Upadhyay, and N. Nath, Biophysical Chemistry Principles & Techniques Handbook. Himalaya Publishing House, 2003. • D. M. Harmening, Laboratory Management, Principles and Processes,

					presen tation	3 rd ed. D.H. Publishing & Consulting Inc., 2012. • I. H. Segel, Biochemical Calculations, 2nd ed. New York: John Wiley and Sons, 1997. • R. H. Linville, and H. A. Kelly, A Guide for Laboratory and Field Work in Zoology, Boston: Ginn & Co., 2019.
	26	31	1	Topic 8: Laboratory instruments- Handling, care and applications of Microscopy, Colorimetry/ spectrophotometer	Power point presen tation	<ul style="list-style-type: none"> • Upadhyay, K. Upadhyay, and N. Nath, Biophysical Chemistry Principles & Techniques Handbook. Himalaya Publishing House, 2003. • D. M. Harmening, Laboratory Management, Principles and Processes, 3rd ed. D.H. Publishing & Consulting Inc., 2012. • I. H. Segel, Biochemical Calculations, 2nd ed. New York: John Wiley and Sons, 1997. • R. H. Linville, and H. A. Kelly, A Guide for Laboratory and Field Work in Zoology, Boston: Ginn & Co., 2019.
Septem ber 2024	2	14	1	Topic 9: pH meter, Centrifuge, Chromatography, Electrophoresis	Power point presen tation	<ul style="list-style-type: none"> • Upadhyay, K. Upadhyay, and N. Nath, Biophysical Chemistry Principles & Techniques Handbook. Himalaya Publishing House, 2003. • D. M. Harmening, Laboratory Management, Principles and Processes, 3rd ed. D.H. Publishing & Consulting Inc., 2012. • I. H. Segel, Biochemical Calculations, 2nd ed. New York: John Wiley and Sons, 1997. • R. H. Linville, and H. A. Kelly, A Guide for Laboratory and Field Work in Zoology, Boston: Ginn & Co., 2019.
	16	21	1	Topic 10: Systems of Units; CGS, FPS and MKS, Calculations and related conversions of Metric system- length (1 millimetre, 1 centimetre, 1 decimetre, 1 decametre, 1 hectometre, 1 kilometre, 1 inch, 1 foot, 1 angstrom, 1 fermi, 1 light year, 1 mile)	Power point presen tation	<ul style="list-style-type: none"> • Upadhyay, K. Upadhyay, and N. Nath, Biophysical Chemistry Principles & Techniques Handbook. Himalaya Publishing House, 2003. • D. M. Harmening, Laboratory Management, Principles and Processes, 3rd ed. D.H. Publishing & Consulting Inc., 2012. • I. H. Segel, Biochemical Calculations, 2nd ed. New York: John Wiley and Sons, 1997. • R. H. Linville, and H. A. Kelly, A Guide for Laboratory and Field Work in Zoology, Boston: Ginn & Co., 2019.

	23	28	1	Topic 11: Mass (1 milligram, 1 centigram, 0.01 gram, 1 decigram, 1 decagram, 10 gram, 1 hectogram, 1 kilogram, 1 stone, 1 pound, 1 ounce)	Power point presentation	<ul style="list-style-type: none"> • Upadhyay, K. Upadhyay, and N. Nath, Biophysical Chemistry Principles & Techniques Handbook. Himalaya Publishing House, 2003. • D. M. Harmening, Laboratory Management, Principles and Processes, 3rd ed. D.H. Publishing & Consulting Inc., 2012. • I. H. Segel, Biochemical Calculations, 2nd ed. New York: John Wiley and Sons, 1997. • R. H. Linville, and H. A. Kelly, A Guide for Laboratory and Field Work in Zoology, Boston: Ginn & Co., 2019.
	30	5 Oct	1	Topic 12: Volume (1 milliliter, 1 centiliter, 1 deciliter, 1 decaliter, 1 hectoliter, 1 kiloliter, 1 cubic inch, 1 gallon, 1 cubic foot)	Power point presentation	<ul style="list-style-type: none"> • Upadhyay, K. Upadhyay, and N. Nath, Biophysical Chemistry Principles & Techniques Handbook. Himalaya Publishing House, 2003. • D. M. Harmening, Laboratory Management, Principles and Processes, 3rd ed. D.H. Publishing & Consulting Inc., 2012. • I. H. Segel, Biochemical Calculations, 2nd ed. New York: John Wiley and Sons, 1997. • R. H. Linville, and H. A. Kelly, A Guide for Laboratory and Field Work in Zoology, Boston: Ginn & Co., 2019.
October	7	12	1	Topic 13: Temperature(Celsius, Fahrenheit, Kelvin); Energy (1 BTU (British thermal unit), 1 erg, 1 foot-pound, 1 calorie, 1 kilowatt- hour, 1 electron volt, 1 liter atmosphere)	Power point presentation	<ul style="list-style-type: none"> • Upadhyay, K. Upadhyay, and N. Nath, Biophysical Chemistry Principles & Techniques Handbook. Himalaya Publishing House, 2003. • D. M. Harmening, Laboratory Management, Principles and Processes, 3rd ed. D.H. Publishing & Consulting Inc., 2012. • I. H. Segel, Biochemical Calculations, 2nd ed. New York: John Wiley and Sons, 1997. • R. H. Linville, and H. A. Kelly, A Guide for Laboratory and Field Work in Zoology, Boston: Ginn & Co., 2019.
	14	19	1	Topic 14: Concentrations: (Percent solutions, ppt, ppm, ppb dilutions, Normality, Molarity and Molality)	Power point presentation	<ul style="list-style-type: none"> • Upadhyay, K. Upadhyay, and N. Nath, Biophysical Chemistry Principles & Techniques Handbook. Himalaya Publishing House, 2003. • D. M. Harmening, Laboratory Management, Principles and Processes, 3rd ed. D.H. Publishing & Consulting Inc., 2012. • I. H. Segel, Biochemical Calculations, 2nd ed. New York: John Wiley and Sons, 1997.

