

BIOL 1505L - Biology and the Modern World Laboratory

Fall 2026 Syllabus, Section 02, CRN 42025,

Credit hours: 1

Instructor

Santosh Rana

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Public Instructor Information

Instructor Title: *Assistant Professor*

Instructor Professional Qualifications: PhD (Botany, Kunming Institute of Botany, 2020); Master's in Science (Botany, Tribhuvan University, 2015);

Bachelor's in Science (Botany, Tribhuvan University, 2011)

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Course Description

1505L. Biology and the Modern World Laboratory. Student investigations in biological phenomena using a variety of laboratory approaches focused on a single theme or concept using the scientific method. Satisfies the Natural Science Laboratory requirement. Not applicable to the Biology major. 1 s.h.

Course Readings

Group	Title	Author	ISBN
Required	Laboratory Notebook	Bound notebook (spiral or composition notebook)	
Required	Laboratory manual and lecture notes	Available on blackboard	
Required	Laboratory coat and goggles	Get your own	

The course readings are subject to change in the event of extenuating circumstances, research developments, current events, and/or to ensure better learning.

Schedule of Topics and Assignments

Day	Date	Reading(s)	Proposed Topic	Due/To Prepare for Class
Wed	8/26	Module 1: Reading & Understanding Science	Introduction to Scientific Papers	Course introduction. Watch assigned Blackboard videos on how to find, read, and understand scientific papers.
Wed	9/2		Finding a Scientific Paper	Simple literature search; identify reliable scientific sources; find a paper related to fermentation, yeast, or fruit.
Wed	9/9		Anatomy of a Scientific Paper	Identify Abstract, Introduction, Methods, Results, Discussion, and References; determine the paper's main question.
Wed	9/16		From Paper to Scientific Report	Read a simple Results/Discussion section and figure; learn how a manuscript-style report is organized.
Wed	9/23	Module 2: Fermentation & Fruit Wine	Meet the Yeast: What Is Fermentation?	Activate yeast, observe fermentation, and learn how CO ₂ can be used as evidence of fermentation.
Wed	9/30		Does Sugar Concentration Matter?	Compare different sugar concentrations and measure fermentation activity.

Wed	10/7	Does Temperature Matter?	Compare yeast fermentation under different temperature conditions.
Wed	10/14	Does pH Matter?	Test how acidity influences fermentation. Mid-term assignment quizzes
Wed	10/21	Fermentation Challenge	Groups use what they have learned about sugar, temperature, and pH to develop conditions for effective fermentation.
Wed	10/28	Different Fruits, Different Fermentation?	Introduce final experiment; groups receive different fruit juices; develop hypothesis and experimental predictions.
Wed	11/4	Fruit Wine Experiment: Setup	Measure initial °Brix/pH, prepare fruit-juice treatments, add yeast, and begin fermentation.
Wed	11/11	No Class	
Wed	11/18	Fruit Wine: Final Observations & Measurements	Observe fermentation; measure final °Brix/pH; compare before/after measurements; pool class data.
Wed	11/25	No Class	
Wed	12/2	Module 1 + Module 2 Turning Our Experiment into a Scientific Paper	Analyze class data, make a figure/table, and begin Results and Discussion.
Wed	12/9	Final exam quizzes	Complete/submit manuscript-style report and discuss what fruit type revealed about fermentation.

The course schedule, policies, procedures, and assignments in this course are subject to change in the event of extenuating circumstances, by mutual agreement, and/or to ensure better learning.