

Techniques in Molecular Biology

One Semester 4-Unit Course Plan

Suggested Lesson Planning Guide

16 weeks, two hours, non-lab class lecture-discussion meetings/weeks and two 2-hour lab period

The corresponding section of the text should be assigned as reading either before or after the class meeting, as determined by the instructor

Week	Text Chapter Section	Lesson Objective	Key Concepts in Lecture/Discussion/Lesson	Lab Lesson Plan/Activity
1	6.1 6.2	Sources of Products Product Assays	<ul style="list-style-type: none">- Products from nature- Comprehensive Product Development Plan- Assays and their applications	<ul style="list-style-type: none">- Lab 6b Assaying for Starch and Sugar
2	6.3	Searching for New Products	<ul style="list-style-type: none">- Herbal remedies, Rainforest products- Active ingredients- Antibiotics and antiseptics	<ul style="list-style-type: none">- Lab 6c Assaying for Amylase Activity
3	6.4 6.5	Plant Products Producing rDNA Products	<ul style="list-style-type: none">- Plant protein products- Recombinant DNA Products	<ul style="list-style-type: none">- Lab 6e Searching for Amylase-Producing Bacteria
4	7.2 7.3	Intro to pH Buffers	<ul style="list-style-type: none">- pH measurement and adjustment- Buffers	<ul style="list-style-type: none">- Lab 7c Measuring the pH of Solutions- Lab 7d Making a Buffer for Amylase Storage
5	7.1	Spectrophotometry Part 1	<ul style="list-style-type: none">- Intro to Spectrophotometers- Absorbance Spectra	<ul style="list-style-type: none">- Lab 7a Learning to Use the Spec- Lab 7b Using the Spectrophotometer to Measure Absorbance
6	7.4	Spectrophotometry Part 2	<ul style="list-style-type: none">- Intro to Spectrophotometers- Using the Spec to Measure Concentration	<ul style="list-style-type: none">- Lab 7f Using the Spec to Study Amylase- Lab 7g Determining the Concentration of Amylase in Solution
7	7.4	Spectrophotometry Part 3	<ul style="list-style-type: none">- UV Spectrophotometry	<ul style="list-style-type: none">- Lab 7i Using the Spec to Study Colorless Molecules
8	-	Midterms	<ul style="list-style-type: none">- Speakers- Testing	<ul style="list-style-type: none">- Lab 8a Restriction Analysis of Lambda DNA Part 2
9	8.1	Steps in Genetic Engineering Part 1	<ul style="list-style-type: none">- Locating “genes of interest”- Restriction enzymes and recombinant DNA	<ul style="list-style-type: none">- Lab 8a Restriction Analysis of Lambda DNA Part 1

10	8.1	Steps in Genetic Engineering Part 2	<ul style="list-style-type: none"> - Restriction enzymes and recombinant DNA - Cloning and manufacturing 	- Lab 8b Restriction Digestion of pAmylase
11	13.3	Intro to PCR	- DNA synthesis, Taq polymerase, thermal cyclers	- Lab 13e Lambda PCR
12	13.4	Applications of PCR Technology	- Genotyping	- Lab 13f/13g Alu PCR Part 1
13	8.2	Transforming Cells	<ul style="list-style-type: none"> - Transformation, transduction, and transfection - Making rDNA, endonucleases, and RFLPs - Performing a transformation, selection of transformants 	<ul style="list-style-type: none"> - Lab 13g Alu PCR Part 2 - Lab 8c Transformation of <i>E. coli</i> with pAmylase Part 1
14	8.3	After Transformation	<ul style="list-style-type: none"> - Scale-up of transformants - Products Assays 	- Lab 8c Transformation of <i>E. coli</i> with pAmylase Part 2
15	8.4	Fermentation, Manufacturing, and GMP	<ul style="list-style-type: none"> - Overview of Manufacturing and cGMP - Quality Control, Quality Assurance, QC/QA testing - Growing cultures, bacterial and mammalian cell culture - Clinical Testing 	<ul style="list-style-type: none"> - Lab 8c Transformation of <i>E. coli</i> with pAmylase Part 3 - Site visit to a Biomanufacturing facility
16		Finals	<ul style="list-style-type: none"> - Lab Cleanup - Testing 	- Lab 8c Transformation of <i>E. coli</i> with pAmylase Part 4