

Week and topic	date	Biotechnology and/or Biology topics covered	Laboratory experiments and/or skills	Readings (L = lab book, M= Mader)	Pre-lab	Quiz	Assignment	My grade
<b>1: Introduction to the lab</b>	8/18 8/20	Intro to biotech and course structure. The Metric system and its application. Lab safety I. Lab notebook.	Assign lab coats, drawers, glasses. Measurements and estimates. <i>Lab notebook. Micropipettes. Chemical and biological hazards</i>	L (3-5, 6-12, 13-14, 16)	Read lab 1. Practice pre-lab.	Practice quiz (Relate Biotech and math, english, career skills)		
<b>2: Introduction to Microscopes</b>	8/25 8/27	Cells, microscopy, ratio/proportion. <i>Lecture: Types of cells, cell parts. Uses of microscopes and function of parts.</i>	Lab preparaion. Metric system, Microscope skills.	L (18-20) M: 55-56, 57-59, 62-65, 67-69, 71-72	Read lab 2. (Pre-lab 2 together in class)	<b>Quiz 1:</b> Metric system, Notebook entry SOP, Safety, Math problem.		Lab2part: ___/20 PL2: ___/10 Q1: ___/10
<b>3: The Cell</b>	9/3	Prokaryotic vs eukaryotic cell. Photosynthesis. Cells, microscopy. <i>Lecture: Types of cells, cell parts and function. Intro to water, solutions, and concentrations. Introduce scientific method</i>	Microscope skills, size measurement. Micropipettes. <i>Summarizing information.</i>	L: M: Review Ch4 (60-61, 65-67, 69-70). Ch 5 (78-85)	Pre-lab 3 background. (protocol together in class)	<b>Quiz 2:</b> Parts of the microscope/function. Measurements using microscope. Types of cells/kingdoms. Basic cell parts.	<i>EX: Math practice problem assignment</i>	Lab3part: ___/20 PL3: ___/10 Q2: ___/10
<b>4: Osmosis and Diffusion</b>	9/8 9/10	<i>Lecture: Water, solutions, and concentrations. Diffusion and osmosis in cells. Using the scientific method to test understanding of phenomenon. Bar graphs, line graphs.</i> Scientific Method. Evaluate data to accept/reject hypothesis. Data collection and presentation. Biological chemistry.	Making solutions of different concentrations. Research questions and hypothesis. Data tables and graphs. Microscope skills. Micropipettes.	M; Ch 5 (86-90). Ch 2 (27-33) L: lab 4	Read over lab report requirements. Pre lab 4	<b>Quiz 3:</b> Cell types and functions Eukaryotic kingdoms. Organelle functions. The scientific method.	1. Lab notebook entry (labs 2-3)	Lab4part: ___/20 PL4: ___/10 Q3: ___/10 LN/R1: ___/20

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<b>5: Mitosis</b>	9/15 9/17	Lecture: Mitosis, chromosomes, genes and cancer. Graphing (algae growth) Cell structure (microscope). DNA->RNA->Protein. Chromosomes, genes and DNA.	Data tables and graphs. Spectrophotometry.	M: Ch8	Pre lab 5	<b>Quiz 4:</b> Concentration math, Osmosis terms, Membranes.	2. Lab notebook entry (lab 4)	Lab5part: ___/20 PL5: ___/10 Q4: ___/10 LN/R2: ___/20
<b>6: Meiosis</b>	9/22 9/24	Lecture: Meiosis, chromosomes, and gene expression. Sexual reproduction in eukaryotes (yeast or algae) DNA->RNA->Protein. Energy flow in biological systems. Chromosomes, genes and DNA.	Teamwork skills in lab.	M: Ch9	Pre lab 6 (on paper)	<b>Quiz 5:</b> Graphing math. Chromosome structure and function. What is Mitosis for, how does it work?	Handout: Midterm project	Lab6part: ___/20 PL6: ___/10 Q5: ___/10
<b>7: Intro to Genetics</b>	9/29 10/1	Lecture: Meiosis, fertilization and punnett squares. Genetic experiments. Scientific Method. DNA->RNA->Protein. Mendelian genetics. Chromosomes, genes and DNA.	Data tables and graphs.	M: Ch10	Pre lab 7	<b>Quiz 6:</b> Genes, cells and chromosomes. Ploidy. Graphing math.	3. Mini lab report (lab 4)	Lab7part: ___/20 PL7: ___/10 Q6: ___/10 LN/R3: ___/20
<b>8: Genetics</b>	10/6 10/8	Lecture: Punnett squares, chromosome review. Phenotype/geneotype, gene expression. Genetic experiments. Evaluate data to accept/reject hypothesis. Mendelian genetics. Chromosomes, genes and DNA.	Data tables and graphs.	M: Ch10, Ch11, (Ch13)	Pre lab 8	<b>Quiz 7:</b> Genes, chromosomes and alleles. Phenotypes and genotypes. Concentrations math.	4. Lab notebook entry (labs 5-8)	Lab8part: ___/20 PL8: ___/10 Q7: ___/10 LN/R4: ___/20

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9: Genetics II, Chemistry I	10/13 10/15 <i>Lecture: Lab safety.</i> Graphing. Lab Safety II. Evaluate data to accept/reject hypothesis. Atomic structure. Ionic/covalent, H-bonds. Photosynthesis. The metric system and its application. Biological chemistry.	Math skills (ratios, computations, calculations, conversions), Metric system. Chemical and biological hazards	M: Ch2	Pre lab 9	<b>Quiz 8:</b> Alleles, genotypes, and phenotypes. Ploidy. Concentrations and dilutions math.	5. Genetics mini-report	Lab9part: ___/20 LN/R5: ___/20 PL9: ___/10 Q8: ___/10
10: Chemistry II	10/20 10/22 <i>Lecture: Lab safety. Atoms and molecules. Concentrations, pH measurements.</i> Lab Safety II. Evaluate data to accept/reject hypothesis. Atomic structure. Ionic/covalent, H-bonds. Photosynthesis. The metric system and its application. Biological chemistry.	Math skills (ratios, computations, calculations, conversions), Metric system. Chemical and biological hazards	M: Ch2	Pre lab 10	<b>Quiz 9:</b> Graphing. Solutions (% , M, changing volumes)	<i>Solutions practice problems</i>	Lab10par: ___/20 PL10: ___/10 Q9: ___/10
11: Chemistry III	10/27 10/29 <i>Lecture: Testing a hypothesis. Concentration and membranes. pH measurements. Making solutions math. Enzymes.</i> Scientific method. Evaluate data to accept/reject hypothesis. Atomic structure. Ionic/covalent, H-bonds. pH. Data collection and presentation. Energy flow in biological systems. Biological chemistry.	Research questions and hypothesis. Teamwork skills in lab. pH meter use.	M: Ch3	Pre lab 11	<b>Quiz 10:</b> Atomic structure and molecules. pH procedure. Molarity, percentage, and dilutions math.	EXAM or MINI-REVIEW (cells, genetics, lab techniques, enzymes, and their applications to biotechnology)	Lab11par: ___/20 PL11: ___/10 Q10: ___/10 EXAM: ___/100
12: Enzymes I (Concentration)	11/3 11/5 <i>Lecture: Analysis of data (bioreactor and environment) Metabolism (photosynthesis) enzymes, and applications.</i> Evaluate data to accept/reject hypothesis. 4 macromolecules of life. Enzymes- function and conditions. Photosynthesis. Biological chemistry.		M: Ch6, p 83-85	Pre lab 12	<b>Quiz 11:</b> Concentrations (% , M, g/L) and dilutions. Buffers and pH. Recipe math.	6. Lab notebook entry (9-11)	Lab12par: ___/20 PL12: ___/10 Q11: ___/10 LN/R6: ___/20

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<b>13: Enzymes II (Protein Structure and Temperature)</b>	11/12	Lecture: Photosynthesis, biomolecules and enzymes (bioreactor). Cellular respiration. In vitro vs in vivo experiments. Graphing. Enzymes- function and conditions. Photosynthesis. Data collection and presentation. Biological chemistry.	Research questions and hypothesis. Scientific method. Spectrophotometry.	M: Ch7	Pre lab 13	<b>Quiz 12:</b> Concentrations. Enzymes.	Math: Graphing data, determining slope	Lab13par: ___/20 PL13: ___/10 Q12: ___/10
<b>14: Enzymes III (Antibodies and pH)</b>	11/17 11/19	Lecture: QA/QC and controlled experiments. Antibodies. Graphing. Scientific Method. Evaluate data to accept/reject hypothesis. pH acids, buffers. Enzymes- function and conditions. Photosynthesis. Biological chemistry.	Research questions and hypothesis. Logarithms. Teamwork skills in lab. Microscopy. Spectrophotometry. pH meter use.	M: Ch6, Ch 7, Ch 11.	Pre lab 14	<b>Quiz 13:</b> Graphing. Enzymes, biomolecules. Scientific method.		Lab14par: ___/20 PL14: ___/10 Q13: ___/10
<b>15: Aseptic Technique and Serial Dilutions</b>	11/24 11/26	Lecture: Aseptic technique, concentrations, dilutions. SOP's and documentation. Lab safety III. Anaerobic vs. cellular respiration. Photosynthesis. Bacterial culturing and tissue culture.	Math skills (ratios, computations, calculations, conversions), Metric system. Chemical and biological hazards	M: Ch17	Pre lab 15	<b>Quiz 14:</b> Cells, enzymes, metabolism. Recipe math and dilutions math.	7. Lab notebook entry (12, 13, 14)	Lab15par: ___/20 PL15: ___/10 Q14: ___/10 LN/R7: ___/20
<b>16: Microbial Growth</b>	12/1 12/3	Lecture: Data logs and graphing. Growth curves and standard curves. Enzymes and growth. SOP's QA/QC. Spectrophotometry. Evaluate data to accept/reject hypothesis. Anaerobic vs. cellular respiration. Energy flow in biological systems. Aseptic culture. Data collection and presentation. Bacterial culturing and tissue culture.	Spectrophotometry. Chemical and biological hazards	M: Ch31, Ch 32.	Pre lab 16	<b>Quiz 15:</b> Concentrations (% , M, g/L) and dilutions. Buffers and pH. Recipe math.	8. Lab report (12-14)	Lab16par: ___/20 PL16: ___/10 Q15: ___/10 LN/R8: ___/20

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17: Review (Final - lab notebook, calculations, interview)	12/8 12/10 . 12/15 12/17	Algae and biofuels.	Skills test. Lab book re-grade option.			BioSc106 Challenge Exam	9. Lab notebook entry (15-17) 10. Mini lab report (15, 16). FINAL PROJECT and/or EXAM.	EXAM: ___/100 LN/R9: ___/20 LN/R10: ___/20 106chal: _____ LNRe: _____