

Biotechnology CAA Course Syllabus

Week One

	Time of Day	What	How
Day 1 (7/19)	Morning	Introduction Cell theory, Prokaryotes vs. Eukaryotes Structure and function – class discussion and ppt.	Ice Breaker, Syllabus, Expectations, Honor Code Powerpoint lecture If you were a cell, what functions would be vital for survival? Make 3D cells (Flinn)
	Afternoon	Lab Safety Lab Techniques Introduction to genetically engineered enzymes	ACS safety video , safety contract (at site) Cheese-making lab (Flinn) 3D Cell Lab report write-up, read pages 2 (bottom) – 6, 21-22; write one page essay (1 – Define biotechnology; 2- Discuss the pros and cons using examples to illustrate point)
	Evening	Lab Report; readings, essay	
Day 2 (7/20)	Morning	Mitosis Meiosis Chromosomes and Chromosomal Abnormalities ppt Complete normal human karyotype	Powerpoint, lecture, Meiosis Simulation (Flinn) Lecture and ppt. Human karyotyping (Flinn)
	Afternoon	Karyotyping ppt Lab: DNA extraction	Powerpoint and lecture Extraction of DNA from strawberries and (protocol from instructor)
	Evening	Study and read	Study sheets on mitosis and meiosis; read pages 53-67, Q: 1-8, read article on Y chromosome

	Time of Day	What	How
Day 3 (7/21)	Morning	Finish HW Review Mendelian Genetics	10 minutes to finish last night's HW Review organelles, function, meiosis and mitosis (Jeopardy game) Lecture: monohybrid crosses Worksheet: Bunny and gecko genetics Lab Activity: Baby genes (Flinn)
	Afternoon	Lesson: Dihybrid crosses Lab: Introduction to pipetting and electrophoresis	Lecture and practice problem Practice pipetting Part II of cheese making lab (cheese-cloth) Electrophoresis of dyes (at site)
	Evening	Reading and study for Assessment #1	Read pg 68-80 (Mendelian genetics) Read pg. 171-173 (Gel electrophoresis) Read pg. 92-103 (Chr. level mutations) Study learning objectives
Day 4 (7/22)	Morning	Assessment #1 Video Karyotype challenge	Test on Days 1-3 material Brief Discussion of SRY gene HHMI (Sex and gender)
	Afternoon	Multiple Alleles, Codominance, ABO blood types Lab	Brief Discussion of ABO blood types and antibodies ABO/ Rh simulated blood typing kit (Flinn) Re-load gels from Wednesday
	Evening	Lab write-up; Research	Research on genetic disorders and reaction paper #1 Read pg. 80-84 Q: 1-4, 6; Y chromosome worksheet
Day 5 (7/23)	Morning	Discussion of Thursday Assessment Discuss of ABO lab results DNA structure, function Video	Powerpoint, lecture Photo 53 and Rosalind Franklin

	Time of Day	What	How
	Afternoon	Transcription and Translation Internet research	Lecture and ppt Lab Activity: Genetic Code Kit (Flinn) Reaction Paper # 2
	Evening (Sunday)	Review and Research	Codon Bingo (from instructor) Begin work on controversial research paper

Week Two

	Time of Day	What	How
Day 6 (7/25)	Morning	Restriction Enzymes Presentation of Diseases Discuss guidelines for controversial paper	Lecture Paper Lab: DNA scissors and DNA goes to the races
	Afternoon	Lab Rosalind Franklin Crossword Puzzle	Restriction Digestion and Analysis of Lambda DNA (Bio-rad)
	Evening	Stain and destain gel Set up starter cultures for transformation	Lab Report for cheese-making
Day 7 (7/26)	Morning	Restriction Mapping Lab	Lecture and Problems Restriction Mapping of Lambda DNA (Carolina)
	Afternoon	Continue research on controversial paper	

	Time of Day	What	How
	Evening	Review	Jeopardy game for assessment #2
Day 8 (7/27)	Morning	Assessment # 2 Transformation pGLO Analyze results from Restriction Mapping	pGLO Bacterial Transformation (Bio-rad) Read pg. 28-31, 38
	Afternoon	Transformation lab continued	
	Evening	Continue research on controversial paper Lab Report: Restriction Mapping	
Day 9 (7/28)	Morning	PCR Isolate Cheek Cells	Begin pGLO Protein Chromatography (Bio-rad) PV92 PCR/ Informatics (Bio-rad) PV92 PCR/ Informatics continued Read pg. 184-187
	Afternoon	Hand cycling into afternoon	
	Evening	Run gel Continue research on controversial paper	
Day 10 (7/29)	Morning	Protein Chemistry and purification	pGLO Protein Chromatography (Bio-rad) pGLO Protein Chromatography (Bio-rad) Computer Lab GATTACA
	Afternoon	Lab	
	Evening	Research on Controversial Papers MOVIE:	

Week Three

	Time of Day	What	How
Day 11 (8/2)	Morning	Lesson: Bioengineered Food Review Game Pre-lab	CD ROM / powerpoint Jeopardy Using Biotechnology to make snow
	Afternoon	Research on Paper Lab	Using Biotechnology to make snow
	Evening		
Day 12 (8/3)	Morning	Field Trip to Boston Museum of Science	
	Afternoon		
	Evening	Research on Controversial Issues	
Day 13 (8/4)	Morning	Research Papers Tour of Marine Lab Restriction Digestion	Carolina webcutter (Carolina) Load and run gel
	Afternoon	Web Cutter and Bioinformatics Discussion of benefits of HGP Human Genome Project Dideoxysequencing Reading Autoradiogram	Paper Simulation of sequencing Discussion, video from HHMI (from instructor) Web Cutter and NCBI web site
	Evening	Finish research papers	

	Time of Day	What	How
Day 14 (8/5)	Morning Afternoon NO evening session	Post-assessment test Cloning Video Complete SPEs Elisa and AIDS testing Lab	Lecture and Discussion Video: The Clone Age (Discovery Channel) Discussion AIDS simulation testing kit (Flinn)
Day 15 (8/6)	Morning Afternoon	Ethical debates Parent teacher meetings	