Central Technology Center
AP Biology
Alignment of Course Content with PASS

The following list of educational objectives for Central Technology Centers' AP Biology course has been aligned with the National Science Education Standards and the Oklahoma *Priority Academic Student Skills* (PASS) Process Standards. It also follows the Oklahoma Department of CareerTech Standard to be considered for high school AP Biology lab science academic credit. Central Technology Centers' highly qualified instructors provide rigorous and relevant curriculum to enable students to succeed in current and future academic endeavors.

Objectives	**National Science Education Standards 9-12 Content Standards**	**Oklahoma PASS Standards**
Molecules and Cells		
Chemistry of Life		
• Describe the fundamental unit of matter, the atom	B, C	
•Describe the functions of protons, electrons, and neutrons	B	
• Define elements and isotopes	B	
• Describe covalent and ionic bonding	B	
• Analyze the chemical and physical properties of water	B	**Content** 5.2
• Examine the structure and function of organic molecules	B	**Content** 5.1, 5.2
• Analyze free energy changes	C	**Content** 5.1, 5.2
• Describe the structure and function of enzymes	C	**Content** 5.1, 5.2, 6.1
Cells		
• Describe the fundamental unit of life, the cell	C	**Content** 1.1, 1.2, 2.1
• Compare and contrast prokaryotic and eukaryotic cells	C	**Content** 1.1, 1.2, 3.1, 5.1
• Describe the components of eukaryotic cells	C	**Content** 1.1, 1.2, 2.1

• Compare and contrast plant and animal cells	C	**Content** 1.1, 1.2, 2.1, 3.1, 5.1, 6.1, 6.2
• Analyze cellular membranes and describe the functions	C	**Content** 1.1, 1.2
• Examine sub cellular organization	C	**Content** 1.1, 1.2
• Analyze the cell cycle and its regulation	C	**Content** 1.1, 1.2, 2.1, 5.1
Cellular Energetics		
• Describe the two fundamental principles of energy	B, C	**Content** 5.2
• Explain how energy is used by living things	B, C	**Content** 5.1, 5.2
• Explain how adenosine triphosphate (ATP) is used	B, C	**Content** 1.1, 2.1, 5.1
• Describe coupled reactions	B	**Content** 5.1
• Explain the process of fermentation	B	**Content** 1.1, 5.1
• Explain the three stages of cellular respiration o Glycolsis, the Kreb's cycle, and the electron transport chain	B	**Content** 1.1, 5.1
• Explain the process of photosynthesis o Location o Light reaction stage o Calvin Cycle o CAM plant variations	B, C	**Content** 1.1, 1.2, 5.1, 5.2, 6.1
Heredity and Evolution		
Heredity		
• Describe the stages of mitosis	B, C	**Content** 2.1, 2.2
• Analyze meiosis and gametogenesis	A, B, C	**Content** 1.1, 1.2, 2.1, 2.2, 3.1, 3.2

• Describe the importance of meiosis	B, C	**Content** 2.2, 5.1
• Assess the organization of Eukaryotic chromosomes	B, C	**Content** 1.1, 1.2, 2.1, 3.1, 3.2
• Demonstrate an understanding of inheritance patterns	A, B, C	**Content** 2.1, 2.2, 3.1, 3.2, 6.1
Molecular Genetics		
• Compare and contrast the structure and function of RNA and DNA	B, C	**Content** 1.1, 2.1, 2.2
• Assess gene regulation and how it occurs	B, C	**Content** 2.1, 2.2
• Analyze mutations, ways they occur, and the possibility of genetic variation	A, B, C, F	**Content** 2.1, 2.2, 3.1, 3.2
• Investigate viral structure and replication	A, B, C, F	**Content** 1.1, 2.1, 2.2, 4.2
• Examine nucleic acid technology and its applications	B, C	**Content** 1.1, 2.1, 2.2
Evolutionary Biology		
• Analyze current theories on early evolution of life	A, C	**Content** 3.1, 3.2, 4.2, 4.3, 5.2, 6.2
• Examine the evidence for evolution	C,	**Content** 3.1, 3.2, 4.2, 4.3, 5.2, 6.2
• Analyze the mechanisms of evolution	A, C	**Content** 3.1, 3.2, 4.2, 4.3, 5.2, 6.2
• Explain microevolution and macroevolution	C	**Content** 3.1, 3.2, 4.2, 4.3, 5.2, 6.2
• Explain the categorization of earth's living things	F	**Content** 3.1, 3.2, 4.2, 4.3, 5.2, 6.2
Organisms and Populations		
Diversity of Organisms		
• Examine evolutionary patterns	C	**Content** 3.1, 3.2, 4.2, 4.3, 5.2, 6.2

• Survey of the diversity of life	F	**Content** 3.1, 3.2, 4.2, 4.3, 5.2, 6.2
• Identify the domains of life	F	**Content** 3.2
• Explain the role and categories of fungi	C	**Content** 1.2, 3.1
• Examine and apply phylogenic classification	A	**Content** 3.1,3.2
• Compare and contrast protostome and deuterostome animal lines	A, C	**Content** 3.1, 3.2, 6.2
• Examine evolutionary relationships	C	**Content** 3.1, 3.2, 6.2
Structure and Function of Plants and Animals		
• Explain the importance of plants	B, C	**Content** 3.2, 4.1, 4.2, 4.3, 5.1, 5.2
• Describe the structure of plants	B	**Content** 1.1, 1.2, 2.1, 2.2, 3.1, 3.2, 4.1,5.1
• Analyze the basic functions in flowering plants	A, C	**Content** 1.1, 1.2, 2.1, 2.2, 3.1, 3.2, 4.1, 6.2
• Analyze how plants respond to external signals	A, C	**Content** 1.1, 1.2, 2.1, 2.2, 3.1, 3.2, 4.1, 6.2
• Compare and contrast the two ways to categorize flowering plants	A, B	**Content** 1.1, 1.2, 2.1, 2.2, 3.1, 3.2, 4.1, 6.2
• Analyze reproduction, growth, and development of plants	A, C	**Content** 1.1, 1.2, 2.1, 2.2, 3.1, 3.2, 4.1, 6.2

• Analyze the structure of humans, including tissues, organs, skin, skeletal system, and muscular system	A	**Content** 1.1, 1.2, 2.1, 2.2, 3.1, 3.2, 5.1
• Examine the structure and function of the human nervous system	A	**Content** 1.1, 2.1, 5.1
• Analyze the human immune system, cardiovascular system, respiratory system, and digestive system	A	**Content** 1.1, 2.1, 5.1
• Analyze the reproduction, growth and development process of animal	A	**Content** 1.1, 2.1, 5.1, 6.2
• Examine structural, physiological, and behavioral adaptations	A	**Content** 1.1, 2.1, 5.1, 6.1, 6.2
• Identify response to the environment	A, F	**Content** 3.1, 3.2, 3.3, 4.1, 4.2, 4.3, 6.1, 6.2
Ecology		
• Examine population dynamics	A, F	**Content** 4.1, 4.2, 4.3, 5.2, 6.2
• Examine structures of communities	A, F	**Content** 4.1, 4.2, 4.3, 5.2, 6.2
• Examine the four primary types of interaction among community members	A, F	**Content** 4.1, 4.2, 4.3, 5.2, 6.2
• Analyze succession in communities	A, F	**Content** 4.1, 4.2, 4.3, 5.2, 6.2
• Define ecosystems and aquatic ecosystems and describe their energy flow	C	**Content** 4.1, 4.2, 4.3, 5.2, 6.2
• Analyze the earth's physical environment, global warming and the earth's climate and biomes	A	**Content** 4.1, 4.3, 5.2, 6.2
• Assess global issues	A	**Content** 4.1, 4.3, 5.2, 6.2

Lab/Activities: These labs follow Collegeboard ® recommendations.		
Diffusion and Osmosis Students will: • Measure the water potential of a solution in a controlled experiment • Determine the osmotic concentration of living tissue or an unknown solution from experimental data • Describe the effects of water gain or loss in animal and plant cells • Relate osmotic potential to solute concentration and water potential • Write a detailed lab report citing all steps in the scientific method	A, B, C	**Process** 1.1, 1.2, 1.3, 3.1, 3.2, 3.3, 3.4, 3.5, 4.1, 4.2, 4.3, 4.4, 4.5, 4.6, 4.7, 5.1, 5.2, 5.3, 6.1, 6.2, 6.3, 6.4
Enzyme Catalysis Students will: • Measure the effects of changes of temperature, pH, enzyme concentration on reaction rates of an enzyme-catalyzed reaction in a controlled experiment • Explain how environmental factors affect the rate of enzyme-catalyzed reactions	A, B, C	**Process** 1.1, 1.2, 1.3, 3.1, 3.2, 3.3, 3.4, 3.5, 4.1, 4.2, 4.3, 4.4, 4.5, 4.6, 4.7, 5.1, 5.2, 5.3, 6.1, 6.2, 6.3, 6.4

Mitosis and Meiosis Students will: • Recognize the stages of mitosis in a plant in or animal cell • Calculate the relative duration of the cell cycle stages • Describe how independent assortment and crossing over can generate genetic variation among the products of meiosis • Use chromosome models to demonstrate the activity of chromosomes during meiosis I and meiosis II • Relate chromosome activity to Mendelian segregation and independent assortment • Demonstrate the role of meiosis in the formation of gametes in a controlled experiment, using a model organism • Calculate the map distance of a particular gene from a chromosome's center or between two genes, using a model organism • Compare and contrast the results of meiosis and mitosis in plant cells • Compare and contrast the result of meiosis and mitosis in animal cells • Write a detailed lab report citing all steps in the scientific method	A, C, E	**Process** 1.1, 1.2, 1.3, 2.1, 2.2, 3.1, 3.2, 3.3, 3.4, 3.5, 4.1, 4.2, 4.3, 4.4, 4.5, 4.6, 4.7, 4.8, 5.1, 5.2, 5.3, 6.1, 6.2, 6.3, 6.4
Plant Pigments and Photosynthesis Students will: • Separate pigments and calculate their Rf values • Describe a technique to determine photosynthetic rates • Compare photosynthetic rates at different temperatures, or different light intensities, or different wavelengths of light using controlled experiments • Explain why the rate of photosynthesis varies under different environmental conditions • Write a detailed lab report citing all steps in the scientific method	A, C, E, F	**Process** 1.1, 1.2, 1.3, 3.1, 3.2, 3.3, 3.4, 3.5, 4.1, 4.2, 4.3, 4.4, 4.5, 4.6, 4.7, 5.1, 5.2, 5.3, 6.1, 6.2, 6.3, 6.4

Cell Respiration Students will: • Calculate the rate of cell respiration from experimental data • Relate gas production to respiration rate • Test the effects of temperature on the rate of cell respiration in ungerminated versus seeds in a controlled experiment • Write a detailed lab report citing all steps in the scientific method	A, C, F	**Process** 1.1, 1.2, 1.3, 3.1, 3.2, 3.3, 3.4, 3.5, 4.1, 4.2, 4.3, 4.4, 4.5, 4.6, 4.7, 5.1, 5.2, 5.3, 6.1, 6.2, 6.3, 6.4
Molecular Biology Students will: • Use plasmids as vectors to transform bacteria with a gene for antibiotic resistance in a controlled experiment • Demonstrate how restriction enzymes are used in genetic engineering • Use electrophoresis to separate DNA fragments • Describe the biological process of transformation in bacteria • Calculate transformation efficiency • Be able to use multiple experimental controls • Design a procedure to select positively for antibiotic resistant transformed cells • Determine unknown DNA fragment sizes when given DNA fragments of known size • Write a detailed lab report citing all steps in the scientific method	A, C, E, F	**Process** 1.1, 1.2, 1.3, 2.1, 2.2, 3.1, 3.2, 3.3, 3.4, 3.5, 4.1, 4.2, 4.3, 4.4, 4.5, 4.6, 4.7, 5.1, 5.2, 5.3, 6.1, 6.2, 6.3, 6.4
Genetics of Organisms Students will: • Investigate the independent assortment of two genes and determine whether the two genes are autosomal or sex-linked using a multigenerational experiment • Analyze the data from their genetic crosses using chi-square analysis techniques • Write a detailed lab report citing all steps in the scientific method	A, C, E, F	**Process** 1.1, 1.2, 1.3, 2.1, 2.2, 3.1, 3.2, 3.3, 3.4, 3.5, 4.1, 4.2, 4.3, 4.4, 4.5, 4.6, 4.7, 4.8, 5.1, 5.2, 5.3, 6.1, 6.2, 6.3, 6.4

Population Genetics and Evolution Students will: • Calculate the frequencies of alleles and genotypes in the gene pool of a population using the Hardy-Weinberg formula • Discuss natural selection and other causes of microevolution as deviation from the conditions required to maintain Hardy-Weinberg equilibrium • Write a detailed lab report citing all steps in the scientific method • Write a detailed lab report citing all steps in the scientific method	A, C	**Process** 1.1, 1.2, 1.3, 2.1, 2.2, 3.1, 3.2, 3.3, 3.4, 3.5, 4.1, 4.2, 4.3, 4.4, 4.5, 4.6, 4.7, 5.1, 5.2, 5.3, 6.1, 6.2, 6.3, 6.4
Transpiration Students will: • Test the effects of the environmental variables on the rates of transpiration using a controlled experiment • Make thin sections of stem, identify xylem and phloem cells, and relate the function of these vascular tissues to the structures of their cells • Write a detailed lab report citing all steps in the scientific method	A, C, E	**Process** 1.1, 1.2, 1.3, 3.1, 3.2, 3.3, 3.4, 3.5, 4.1, 4.2, 4.3, 4.4, 4.5, 4.6, 4.7, 5.1, 5.2, 5.3, 6.1, 6.2, 6.3, 6.4
Physiology of the Circulatory System Students will: • Measure heart rate and blood pressure in a human volunteer • Describe the effect of changing body position on hear rate and blood pressure • Explain how exercise changes hear rate • Determine a human's fitness index • Analyze cardiovascular data collected by the entire class • Discuss and explain the relationship between heart rate and temperature • Write a detailed lab report citing all steps in the scientific method	A, C, E, F	**Process** 1.1, 1.2, 1.3, 3.1, 3.2, 3.3, 3.4, 3.5, 4.1, 4.2, 4.3, 4.4, 4.5, 4.6, 4.7, 4.8, 5.1, 5.2, 5.3, 6.1, 6.2, 6.3, 6.4

Animal Behavior Students will: • Describe some aspects of animal behavior, such as orientation behavior, agonistic behavior, dominance display, or mating behavior • Understand the adaptiveness of the behaviors they have studied • Write a detailed lab report citing all steps in the scientific method	A, C, F	**Process** 1.1, 1.2, 1.3, 3.1, 3.2, 3.3, 3.4, 3.5, 4.1, 4.2, 4.3, 4.4, 4.5, 4.6, 4.7, 5.1, 5.2, 5.3, 6.1, 6.2, 6.3, 6.4
Dissolved Oxygen and Aquatic Primary Productivity Students will: • Measure primary productivity based on changes in dissolved oxygen in a controlled experiment • Investigate the effects of changing light intensity and/or inorganic nutrient concentrations on primary productivity in a controlled experiment • Write a detailed lab report citing all steps in the scientific method	A, B, C, E, F	**Process** 1.1, 1.2, 1.3, 3.1, 3.2, 3.3, 3.4, 3.5, 4.1, 4.2, 4.3, 4.4, 4.5, 4.6, 4.7, 6.1, 6.2, 6.3, 6.4
Organisms Students will: • List each of the four possible components required for photosynthesis to occur and the two possible end products • Discuss the connection between starch production and the process of photosynthesis • Diagram and label a food chain • Discuss the pathways of energy transfer through food webs and the efficiency of the transfer • Conclude on what the four key ingredients needed for photosynthesis • Write a detailed lab report citing all steps in the scientific method	A, B, C,	**Process** 1.1, 1.2, 1.3, 3.1, 3.2, 3.3, 3.4, 3.5, 4.1, 4.2, 4.3, 4.4, 4.5, 4.6, 4.7, 6.1, 6.2, 6.3, 6.4

Plant Cells Students will: • Observe major cellular organelles microscopically • Chart the organelles and their functions • Observe the similarities and differences between plant and animal cells • Apply the knowledge of the differences to real-life situations • Prepare and observe plant cells microscopically • Prepare plant cell to view stomata • Observe stoma microscopically • Prepare and observe one cell organisms microscopically • Observe one cell organisms phagocytosis microscopically • Write a detailed lab report citing all steps in the scientific method	A, C, E	**Process** 1.1, 1.2, 1.3, 3.1, 3.2, 3.3, 3.4, 3.5, 4.1, 4.2, 4.3, 4.4, 4.5, 4.6, 4.7, 4.8, 5.1, 5.2, 5.3, 6.1, 6.2, 6.3, 6.4
Cellular Respiration Students will: • Explain the process of aerobic respiration in plants and animals • Compare the rate of cellular respiration and carbon dioxide production while at rest with that of during exercise • Compare and contrast ethanol fermentation and lactic acid fermentation • Use indicator chemicals to test for the movement of molecules • Determine direction and diffusion • Analyze the process of osmosis in living cells • Write a detailed lab report citing all steps in the scientific method	A, B, C	**Process** 1.1, 1.2, 1.3, 3.1, 3.2, 3.3, 3.4, 3.5, 4.1, 4.2, 4.3, 4.4, 4.5, 4.6, 4.7, 4.8, 5.1, 5.2, 5.3, 6.1, 6.2, 6.3, 6.4

Heredity Students will: • Demonstrate knowledge of the stages of meiosis • Demonstrate an understanding of the changes in chromosome number that occur during meiosis and fertilization • Compare meiosis I with meiosis II I terms of the position of the chromosomes in each stage, changes in chromosome number and daughter cells • Simulate the process of crossing-over between homologous chromosomes • Draw and complete Punnett squares and use them to determine genetic probabilities in monohybrid crosses • Write a detailed lab report citing all steps in the scientific method	A, C, F	**Process** 1.1, 1.2, 1.3, 3.1, 3.2, 3.3, 3.4, 3.5, 4.1, 4.2, 4.3, 4.4, 4.5, 4.6, 4.7, 4.8, 5.1, 5.2, 5.3, 6.1, 6.2, 6.3, 6.4
Genetics Students will: • Determine genotypes using pedigree charts • Examine why more males express x-linked traits • Solve genetic problems involving dominate-recessive inheritance, x-linked traits, multiple allele traits and codominance • Graphing the evolutionary relationship between sickle-cell disease and malaria • Write a detailed lab report citing all steps in the scientific method	A, C, F	**Process** 1.1, 1.2, 1.3, 3.1, 3.2, 3.3, 3.4, 3.5, 4.1, 4.2, 4.3, 4.4, 4.5, 4.6, 4.7, 4.8, 5.1, 5.2, 5.3, 6.1, 6.2, 6.3, 6.4

DNA Students will: • Demonstrate DNA structure and base-pairing rule • Create charts explaining the roles of protein synthesis including; DNA, mRNA, tRNA and ribosomes • Form a model of transcription and translation from a strand of DNA • Determine the sequence of amino acids in the polypeptide chain resulting from translation and transcription • Research changes in DNA code and how it may affect protein synthesis • Research the health affects of changes in the DNA code • Observe some DNA fingerprints • Analyze some similarities and differences between samples of DNA fingerprints • Write a detailed lab report citing all steps in the scientific method	A, B, C, F	**Process** 1.1, 1.2, 1.3, 3.1, 3.2, 3.3, 3.4, 3.5, 4.1, 4.2, 4.3, 4.4, 4.5, 4.6, 4.7, 6.1, 6.2, 6.3, 6.4
Ecology Students will: • Estimate the size of a population using methods of sampling • Create ecological quadrants for prediction • Calculate percent error • Graph population size and error • Analyze real-life situations where this could be helpful • Write a detailed lab report citing all steps in the scientific method	A, C, F	**Process** 1.1, 1.2, 1.3, 3.1, 3.2, 3.3, 3.4, 3.5, 4.1, 4.2, 4.3, 4.4, 4.5, 4.6, 4.7, 5.1, 5.2, 5.3, 6.1, 6.2, 6.3, 6.4

Microscope Students will: • Identify the parts of a compound and dissecting microscopes and the functions • Choose correct type of microscope for sample viewing • Focus the compound microscope using scanning, low-, high-powered lenses • Prepare a wet mount slide • Correct viewing problems that commonly occur when using a compound microscope • Use the microscope to test a hypothesis • Write a detailed lab report citing all steps in the scientific method	A, E	**Process** 1.1, 1.2, 1.3, 3.1, 3.2, 3.3, 3.4, 3.5, 4.1, 4.2, 4.3, 4.4, 4.5, 4.6, 4.7, 5.1, 5.2, 5.3, 6.1, 6.2, 6.3, 6.4
Nutrition Students will: • Test an unknown sample for the presents of organic molecules • Relate the nutrient content of a food to its original function in plants and animals • Discuss the benefits and drawbacks of using carbohydrates vs. lipids as energy storage molecules for embryos • Chart the Federal Dietary Guidelines • Analyze the nutritional value of your meals • Write a detailed lab report citing all steps in the scientific method	A, B, C, F	**Process** 1.1, 1.2, 1.3, 3.1, 3.2, 3.3, 3.4, 3.5, 4.1, 4.2, 4.3, 4.4, 4.5, 4.6, 4.7, 4.8, 5.1, 5.2, 5.3, 6.1, 6.2, 6.3, 6.4

Skin Students will: • Observe fresh skin cells under a microscope • Observe the layers of the skin on prepared slides • Discuss the functions of each layer • Observe sample of cells from individuals own mouth • Discuss the similarities and differences of the two slides • Create and label a diagram of skin layers including major function • Analyze the function and the arrangement for each part of a cell • Discuss adaptations of epithelial tissue that demonstrate the relationship between structure and function • Write a detailed lab report citing all steps in the scientific method	A, C, E	**Process** 1.1, 1.2, 1.3, 3.1, 3.2, 3.3, 3.4, 3.5, 4.1, 4.2, 4.3, 4.4, 4.5, 4.6, 4.7, 6.1, 6.2, 6.3, 6.4
Animals Students will: • Observe external features of preserved female and male animal • Observe/ dissect preserved animal for view of body systems • Locate organs • Discuss how organs are specialized to perform specific functions • Compare and contrast the features with that of a human • Write a detailed lab report citing all steps in the scientific method	A, C	**Process** 1.1, 1.2, 1.3, 3.1, 3.2, 3.3, 3.4, 3.5, 4.1, 4.2, 4.3, 4.4, 4.5, 4.6, 4.7, 6.1, 6.2, 6.3, 6.4

Explanatory Notation:

AP Calculus AB is not mandated by the Oklahoma PASS objectives. However, the College Board governs all course sequencing and objectives.

Oklahoma School of Science and Mathematics
Drumright Regional Center
AP CALCULUS AB SYLLABUS
2011-2012

Instructor: John Mullen

Overview: This course will provide a multi-representational study of basic calculus concepts using geometric, analytic, numeric, and verbal methods. The course is taught at the collegiate level and it is our full intent for students to receive college credit for Calculus II through the Advanced Placement program tests. The topics covered will be Local Linearity, Functions and Limits, the Derivative, the Integral, and various applications of differentiation and integration.

Text: Calculus by Dale Varberg-Edwin J. Purcell 9th Edition

Weekly Schedule:

The classes will be a mixture of lectures, lab explorations and guided practice and will vary according to the topic being covered. Each student is responsible for getting each day's notes and assignments even if the student is gone during the class period. All assignments must be turned in on or before the announced due date.

Exams: There will be 4-5 exams plus a final during the course of the semester. Each exam will be cumulative with the greatest emphasis being placed on the most current material.

Grading:	Homework/Quizzes:	30%
	Portfolio:	10%
	Exams:	40%
	Final:	20%

Calculator: The calculator should be used to experiment, interpret results, and verify solutions obtained analytically. The four specific concepts that each student should learn to do with the calculator include: graphing a function in an arbitrary window, finding the derivative of a function at a numerical value, evaluating an indefinite integral, and finding the numerical roots of an equation.

Curricular Requirements: Students should be able to show understanding of the theory and the application of functions, limits, derivatives, integrals and sequences/series in graphical, numerical and analytical situations.

Each student will be required to show this understanding by explaining homework in class orally and by writing their solutions on the marker boards. Also, students will take group quizzes in order to get experience in making group decisions.

The following syllabus will provide the content for this experience.

I) Pre-calculus review (approximate time 4 weeks)

This review will consist of an overview of:

a) Trigonometry
b) Equations
c) Polynomial and rational functions
d) Exponential and logarithmic functions
e) Analytic geometry.

II) Limits (approximate time 2-3 weeks)

a) Graphical and intuitive meaning of a limit of a function.
b) Finding limits graphically, numerically using graphing calculators. Using algebraic methods (factoring etc.)
c) Graphical understanding of continuity
d) Using limits to determine continuity of a function.
e) Application of The Intermediate Value Theorem
f) Applying limits to determine vertical and horizontal asymptotes.

III) The Derivative (approximate time 10 weeks)

a) Using the definition of the derivative
b) Using the relationship between the derivative and continuity.
c) Using the rules for the derivative (constant, identity, power, sum, difference, product, quotient, chain)
d) Using implicit and logarithmic differentiation
e) Applying methods of approximating the derivative
f) Applications of the derivative: (related rate problems, maximum and minimum problems; intervals of increasing and decreasing, concavity, inflection points, local and absolute maximum and minimum for functions; equations of tangent lines to graphs; finding velocity, speed and acceleration).
g) Graphical relationships of $f(x)$, $f'(x)$, and $f''(x)$.
h) Application of the Mean Value Theorem for the derivative

i) Memorizing the derivative of: trigonometric functions, exponential functions, logarithmic functions
j) Using L'Hopitals' rules
k) Using Newton's method of approximating roots of a function
l) Drawing slope fields for differential equations
m) Using Euler's method of approximating a functional value.

IV) The Integral (approximate time 10 weeks)

a) Using the definition of the integral and the power rule for antidifferentiation.
b) Solving separable differential equations
c) Applying the Fundamental Theorems of Calculus
d) Use the various properties of the integral (linearity, interval addition property)
e) Use the Mean Value Theorem for integrals.
f) Use methods of integration (u, du substitution, trigonometric substitution, integration by parts, partial fractions)
g) Use methods of approximating integrals (Riemann sums, Trapezoidal rule, Simpsons' Rule, algebraic sum of area)
h) Application of integration (areas bounded by curves, finding velocity, displacement; volumes of solids by disks, washers, shells and cross sections; arc length, surface area, work, word problems dealing with rates, average value of a function)
i) Finding the improper integrals
j) Memorize the integral of (Trigonometric functions, exponential functions, logarithmic function, expression whose integral is the inverse sine and tangent and secant functions)

V) Practice AP Calculus exams (approximate time 5 weeks)

Three AP Calculus BC exams will be given as a review for the AP exam given in May by the College Board. The free response part of the practice exams will be from past AP exams and the multiply choice part will be from the Princeton review materials.

Calculus Homework Guidelines

The weekly homework will include reading assignments and exercises. To be successful in this class, you will need to work on homework **daily.**

Reading Assignments/Outlines

I will expect you to read each section prior to the date that the material will be covered in class. As part of this reading assignment, you should outline each section and include it in your calculus portfolio.

The following is a guideline to use in outlining the section:

1. Write ½-1 page of thoughtful notes. Try to keep it under one page.
2. Include the definitions, formulas, and theorems that are in highlighted print.
3. Note the major concepts and ideas.
4. Include your own interpretation of definitions, formulas, and concepts. Provide creative examples on how to put these formulas and concepts to work.
5. Include any questions you may have.

Homework:

1. Homework should be done in a timely manner. Daily participation and quizzes will be based on the assigned homework.
2. I do not want to see just the answer to the problem. I am really looking for the reasoning you used in arriving at an answer more than the answer itself. As a result, you must show **all** your work in order to receive credit for that problem.
3. Word Problems:
   State all the givens – include a picture and/or graph
   State what you are trying to find
   Identify all your variables and units
   Make an estimate
   Identify the steps or approach needed to solve the problem
   Logically follow the steps to solve the problem
   Check your answer with your estimate
4. If you are absent, you are still responsible for the reading, note taking, and homework the day it is due. Please make arrangements if you know you are going to be absent.
5. Neatness counts. If I can't tell what you did, you will not receive credit for the work.

Portfolio:

Your calculus portfolio should include three sections: homework, tests, and section outlines (notes).
Your portfolio will be checked at the end of each nine-week grading period. The portfolio will be checked for **completeness** and for **organization.**

Section Five

CENTRAL TECHNOLOGY CENTER
BIOMEDICAL SCIENCES ACADEMY
PLAN OF STUDY

Grade in High School	Biomedical Course	Mathematics Course	Science Course
Sophomore (1st year)	Principles of Biomedical Sciences (PLTW) Global Challenges (PLTW)	Algebra II	Chemistry
Junior (2nd year)	Human Body Systems (PLTW) Medical Interventions (PLTW)	Pre-Calculus	Microbiology
Senior (3rd year)	Biomedical Innovations (PLTW)	AP Calculus AB (OSSM)	AP Biology

BIOMEDICAL SCIENCES ACADEMY
COURSE DESCRIPTIONS

SOPHOMORE (1ST Year)

PRINCIPLES OF BIOMEDICAL SCIENCES

Students explore the concepts of human medicine and are introduced to research processes and to bioinformatics. Hands-on projects enable students to investigate human body systems and various health conditions, including heart disease, diabetes, sickle-cell disease, hypercholesterolemia, and infectious diseases. Over the length of the course, students work together to determine the factors that led to the death of a fictional person. After pinpointing those factors, the students investigate lifestyle choices and medical treatments that might have prolonged the person's life. The course is designed to provide an overview of all the courses in the Biomedical Sciences program and to lay the scientific foundation necessary for student success in the subsequent courses. The key biological concepts embedded in the curriculum include homeostasis, metabolism, inheritance of traits, feedback systems, and defense against disease. Where appropriate, engineering principles are also incorporated into the curriculum; these include the design process, feedback loops, fluid dynamics, and the relationship of structure to function.

GLOBAL CHALLENGES

Students investigate and design innovative solutions to address the broad challenges facing local, national, and global communities such as access to clean water, a sufficient and safe food supply, adequate health care and sustainable energy sources. The course incorporates national standards for science, technology and mathematics, reinforcing material from students' other courses and helping strengthen mastery of those concepts. The rigorous course also helps students develop a wide variety of skills, including teamwork, critical thinking, problem solving, documentation and presentation. The course blends science, technology, engineering, and mathematic concepts to present students with a rigorous and relevant curriculum that promotes global awareness and citizenship.

ALGEBRA II

This course will enhance and expand the mathematical foundations of Algebra I and Geometry. The course will stress the fundamental extension of previous mathematics and the preparation for future higher-level mathematics courses. It will involve operations with real and complex numbers as well as matrices. The problem-solving processes will use functions and relations within the course applications of math; while satisfying predictions based on a set of data, the use of data analysis and statistics will be justified. Students who master this course will gain experience with quadratic functions, logarithmic and exponential functions, linear functions, solution methods for systems of linear functions, and matrix operations. The pre-requisites for this course are Algebra I and Geometry,

CHEMISTRY

Chemistry is designed to prepare students for the complex thinking that will be expected in future science courses. This course will focus on the development of the student as a scientist through the study of chemistry. Being a scientist requires a broad set of tools, including theory, problem-solving, written and oral communications, interpreting data and laboratory skills. Areas covered are: matter, atoms and periodic table, molecules and compounds, chemical reactions and stoichiometry, aqueous solutions and reactions, gases, energy and chemical reactions, atomic and molecular structure. Pre-requisites for this course are Algebra I and Biology I.

JUNIOR (2nd Year)

HUMAN BODY SYSTEMS

Students examine the processes, structures, and interactions of the human body systems to learn how they work together to maintain homeostasis (internal balance) and good health. Using real-world cases, students take the role of biomedical professionals and work together to solve medical mysteries. Hands-on projects include designing experiments, investigating the structures and functions of body systems, and using data acquisition software to monitor body functions such as muscle movement, reflex and voluntary actions, and respiratory operation. Important concepts covered in the course are communication, transport of substances, locomotion, metabolic processes, defense and protection.

MEDICAL INTERVENTION

Student projects investigate various medical interventions that extend and improve quality of life, including gene therapy, pharmacology, surgery, prosthetics, rehabilitation, and supportive care. The course explores the design and development of various medical interventions, including vascular stents, cochlear implants, and prosthetic limbs. In addition, students review the history of organ transplants and gene therapy, and stay updated on cutting-edge developments via current scientific literature. Using 3D imaging, data acquisition software, and current scientific research, students design a product that can be used as a medical intervention.

PRE-CALCULUS

This course is designed to be in preparation for AP Calculus. A graphing calculator is recommended. The first part of the course includes a study of six basic functions of trigonometry, solutions of right and oblique triangles, identities and complex numbers. The calculator is used as an aide to computations. The second half of the course gives a review study of straight lines, conic sections, simplification of equations, algebraic curves, transcendental curves, a completed study of straight lines, simplification of equations, polar coordinates, and an introduction to limits and derivatives. Pre-requisites for this course are Algebra I, Geometry and Algebra II.

MICROBIOLOGY
This course guides students through a brief history of microbiology, builds an understanding of the relationship between microorganisms and the chemistry of their environments, and allows for an exploration of the structures and functions of microorganisms. Students will classify and characterize prokaryotes, microscopic eukaryotes, and viruses. Diseases caused by microscopic pathogens will be discussed in correlation with the body systems that they affect. Students will be required to use computers and laboratory technologies to accomplish tasks.

SENIOR (3RD Year)

BIOMEDICAL INNOVATIONS
This capstone course gives student teams the opportunity to work with a mentor, identify a scientific research topic, conduct research, write a scientific paper, and defend team conclusions and recommendations to a panel of outside reviewers. Each student team has one or more mentors from the scientific or medical community guiding its scientific research. This course may be combined with the capstone course from the engineering pathway, allowing students from the pathways to work together to engineer a new health care-related product or process innovation.

AP CALCULUS AB
This course will provide a multi-representational study of basic calculus concepts using geometric, analytic, numeric, and verbal methods. The course is taught at the collegiate level and it is our full intent for students to receive college credit for Calculus II through the Advanced Placement program tests. The topics covered will be Local Linearity, Functions and Limits, the Derivative, the Integral, and various applications of differentiation and integration.

AP BIOLOGY
Advanced Placement Biology (AP Biology) is designed to be the equivalent of a college introductory course for biology majors. Upon successful completion of the course students should be able to enter college prepared for college-level course work. AP Biology is a fast paced course that emphasizes molecules and cells, heredity and evolution, as well as organisms and populations. As a college level course, advanced lab techniques will be taught and current bioethical issues will be discussed. Students will learn through laboratory and lecture methods using group and individual activities, cooperative learning, presentations, and technology to enhance the learning environment. Students will be challenged to develop a conceptual framework and an appreciation of science as a process.

OPTIONAL ACADEMIC COURSES IF NEEDED

GEOMETRY
This course will allow students the chance to relate mathematics to real-life situations and careers. It will build logical reasoning capabilities as well as give students an opportunity to justify conclusions in a structured manner. Students will analyze characteristics and properties of two- and three-dimensional geometric shapes. They will use visualization, spatial reasoning,

and geometric modeling to solve problems. Throughout the course, students connect the algebra skills previously developed to the geometric concepts. This is a rigorous course that prepares students for higher-level mathematics and correlates with National Council of Teachers of Mathematics content and process standards and with Oklahoma PASS objectives. The pre-requisite for this course is Algebra I.

AP CALCULUS BC

Students will be able to show understanding of the theory and the application of functions, limits, derivatives, integrals, sequences and series in graphical, numerical and analytical situations. Each student will be required to show this understanding by explaining homework in class orally and by presenting their solutions in complete sentences with proper notation and units when required.

PHYSICS

This course will cover kinematics in one and two dimensions, as well as forces and vectors. Students will study work, energy, and power that will then lead into the study of momentum and the conservation of energy. Circular motion and gravitation, translational and rotational equilibrium, fluid mechanics and thermal physics will be covered. The students will study electricity and magnetism, and then look at waves and optics. A final subject area will be atomic and nuclear physics. Good math skills are critical to success in this course. Pre-requisites are: Biology I, Algebra I, Geometry, Algebra II (or concurrent enrollment in Algebra II).

ANATOMY AND PHYSIOLOGY

This course is devoted to the study of the human body and its structures and functions. This course provides an opportunity for students to develop scientific process skills, laboratory techniques, and an understanding of the fundamental principles of the human body. Students will explore the various organ systems within the human body, both structure and function; and relate how these organ systems work together to maintain homeostasis.

AP CHEMISTRY

Chemistry is the study of the properties of materials and the changes that materials undergo. A student will see how chemical principles operate in all aspects of our lives, from everyday activities to far-reaching matters like the development of drugs to cure cancer. Students will learn through laboratory and lecture methods using group and individual activities, cooperative learning, presentations, and technology to enhance the learning environment. Students will learn how to design and conduct experiments using a variety of laboratory techniques and technology to investigate a chemical concept. Students will apply stoichiometric concepts to chemical reactions and analyze how atomic structure relates to periodicity. The students will analyze how atomic structures relate to chemical bonding and apply chemical concepts to reactions in aqueous solution. They will also learn about gas laws as well as study electrochemistry. Pre-requisites are: Algebra I, Geometry, Biology I, Chemistry or Pre-AP Chemistry.

AP PHYSICS C: Mechanics

The AP Physics C: Mechanics course will introduce the basic concepts of physics and lay a foundation for future college physics courses. The topics to be covered are mechanics, electricity and magnetism, waves and optics.

ST00003 - PRINCIPLES OF BIOMEDICAL SCIENCES

COURSE DESCRIPTION

This course provides an introduction to the biomedical sciences through exciting "hands-on" projects and problems. Student work involves the study of human medicine, research processes and an introduction to bio-informatics. Students investigate the human body systems and various health conditions including heart disease, diabetes, sickle-cell disease, hypercholesterolemia, and infectious diseases. The course is designed to provide an overview of all the courses in the Biomedical Sciences program and to lay the scientific foundation necessary for student success in the subsequent courses. (2009 PLTW PBS Curriculum)

Type of Course: Theory with Lab
High School Credits: varies by high school
Total Contact hours: 120
Prerequisites: Biology I
Pathway: Science, Technology, Engineering & Mathematics
OHLAP Credit: No
OCAS Code: 8707
Theory hours: 80
Lab hours: 40

Instructor: Denise Radcliff, MLT ASCP, NBCT
Phone: (918) 352-2551, Ext. 292
Email: deniser@centraltech.edu
Campus: Drumright

Campus Director: Dr. Anita Reynolds
Phone: (918) 224-9300
Email: anitar@centraltech.edu
Campus Assistant Directors:
Mrs. LaDonna Gear, Mr. Ron Tackett

REQUIRED TEXT, REFERENCES, AND MATERIALS

Text(s):
References:
Materials: PLTW PBS Curriculum , LabView Software, Inspiration Software
Estimated Cost for Materials: See Program Handbook
Uniforms/Tools: Lab coats; Lab Notebook
Estimated Cost for Uniforms/Tools: See Program Handbook

COURSE COMPETENCIES

Competency	Assessment of Competency
Individuals who accept the responsibility of continuous self-evaluation will benefit from personal growth, professional development and increased employability.	Completion of examination with 70% accuracy.
Individual contributions to group processes facilitate the solving of complex problems and the achievement of common goals.	Completion of examination with 70% accuracy.
Mathematics is the body of knowledge used to describe the scientific principles that happen naturally in the world, and technology is the application of these principles to produce products and services to benefit society.	Completion of examination with 70% accuracy.
Skillful researchers are proficient with the technologies and strategies used to gather, organize, document, and disseminate information.	Completion of examination with 70% accuracy.
The use of the design process to analyze and solve problems has greatly improved the quality of, and the speed at which, new products are created.	Completion of Examination with 70% accuracy.
Project success is dependent on problem identification, planning, and the allocation of resources.	Completion of Examination with 70% accuracy.

Consideration of the ethical, environmental, social, and economic impacts of the engineering design process is essential to being a responsible, involved citizen.	Completion of Examination with 70% accuracy.
Critical thinking involves using a variety of established and original problem-solving techniques.	Completion of Examination with 70% accuracy.
In order to solve complex problems, the use of systems which monitor and correct performance must be developed.	Completion of Examination with 70% accuracy.
Understanding contemporary issues aids in determining the solutions to complex problems.	Completion of Examination with 70% accuracy.

COURSE ACTIVITIES

In this course students will:

- Complete activities, projects, and problems as directed by the curriculum.
- Perform research using Internet and class reference materials.
- Participate in class discussions regarding activities.
- Present research and laboratory findings via power point.
- Utilize safety precautions during laboratory experimentation.
- Develop skills as pertaining to laboratory experimentation.
- Perform laboratory procedures.
- Complete evaluations with 70% accuracy or higher.

GRADE POLICY

40% Activities, Projects, & Presentations
20% Evaluations
20% Laboratory Performance (Exempt in this course)

Central Tech Grading Scale

A = 90.00 – 100.00
B = 80.00 – 89.99
C = 70.00 – 79.99
D = 60.00 – 69.99
F = 0.00 – 59.99

COURSE OUTLINE

Unit	Topics and Competencies	Est. Time	Assessment
1	Human Body Systems	10 Hours	Completion of examination with 70% accuracy.
2	Heart Attack	20 Hours	Completion of examination with 70% accuracy.
3	Diabetes	20 Hours	Completion of examination with 70% accuracy.
4	Sickle Cell Disease	20 Hours	Completion of examination with 70% accuracy.
5	Hypercholesterolemia	15 Hours	Completion of examination with 70% accuracy.
6	Infectious Diseases	15 Hours	Completion of examination with 70% accuracy.
7	Medical Interventions	10 Hours	Completion of examination with 70% accuracy.
8	Grant Proposal	10 Hours	Completion of examination with 70% accuracy.

INSTRUCTOR'S POLICY ON ABSENCES

Students should procure work prior to planned absences and initiate with instructor the procurement of missed work for unplanned absences before scheduled class time. Work not completed will result in the absence of points.

INSTRUCTOR'S LATE WORK POLICY

Late work will only be accepted due to absences involving sickness or planned events related to the student's home school or family. Late work will be submitted within the same number of days missed by the student for full credit. Work turned in the day after the due date will result in a lowering of the potential grade by 20%. Work turned in the

second day after the due date will result in a lowering of the potential grade by 50%. Work will not be accepted after the third day.

OTHER LAB AND CLASSROOM POLICIES

Laboratory safety must be adhered to rigorously by students during all laboratory procedures. Laboratory safety procedure is posted in the laboratory area. Responsibility for laboratory station order and cleanliness before, during , and after laboratory procedures belongs to the students.

AMERICANS WITH DISABILITIES ACT (ADA)

According to the ADA, each adult student with a disability is responsible for notifying Central Technology Center of his/her disability and requesting accommodations. If you think you have a qualified disability and need classroom accommodations, contact the Campus Director located in Student Services. Please advise the instructor of your disability as soon as possible, to ensure timely implementation of appropriate accommodations. Faculty has an obligation to respond when they receive official notice of a disability from the Campus Director but are under no obligation to provide retroactive accommodations. To receive services, a student must submit appropriate documentation and complete an intake process during which the existence of a qualified disability is verified and reasonable accommodations are identified.

ACADEMIC DISHONESTY

Academic dishonesty or misconduct is neither condoned nor tolerated at Central Technology Center. Any student found guilty of academic dishonesty or misconduct shall be subject to disciplinary action. Academic dishonesty and/or misconduct includes, but is not limited to, the following actions: (1) Plagiarism: The representation of previously written, published or creative work as one's own; (2) Unauthorized Collaboration on Projects; (3) Cheating on Examinations; (4) Unauthorized Advance Access to Exams; (5) Fraudulent Alteration of Academic Materials; (6)Knowing Cooperation with Another Person in an Academically Dishonest Undertaking. Students are required to actively protect their work against misuse by others. For details, refer to The Central Technology Center Student Handbook available in Student Services.

STUDENT CONDUCT

Students are expected to cooperate in maintaining a classroom environment conducive to learning. Courteous and respectful behavior will be expected from all students each day. All pagers, cellular phones, computers, CD and MP3 players should be turned off. The use of tobacco in any form in Central Technology Center buildings is prohibited.

Central Tech
Course Syllabus

ST00006 – ALGEBRA II

COURSE DESCRIPTION

Algebra II will be taught through a variety of methods such as daily work, hands-on activities and homework assignments. We will learn to apply algebraic concepts to solve real life problems.

Type of Course: Theory
High School Credits: varies by high school
Total Contact hours: 120
Prerequisites: Algebra I
Instructor: Scott Makintubee
Phone: (918) 352-2551, Ext. 382
Email: scottm@centraltech.edu
Campus: Drumright

Pathway: Science, Technology, Engineering & Mathematics
OHLAP Credit: Yes **OCAS Code:** 4412
Theory hours: 40 **Lab hours:** 80

Campus Director: Dr. Anita Reynolds
Phone: (918) 224-9300
Email: anitar@centraltech.edu
Campus Assistant Directors:
Mrs. LaDonna Gear, Mr. Bruce McKinzie

CLASSROOM PROCEDURES AND RULES FOR BEHAVIOR

1. Be prepared with your textbook, pencil and paper when class starts.
2. Be in your seat ready to work on time.
3. Treat others with respect.
4. Cell phone use will not be allowed.
5. Use the restroom before class. Restroom passes will be rarely allowed.
6. If you are at Tech, you are expected to attend Algebra II.

ABSENCES

If you must be absent, it is your responsibility to make up all missing assignments or tests. You will have as many days to make up your work, as you were absent. **There will be no make up allowed on daily work, if you are absent, late or unprepared, you will receive a zero on that work.**

GRADES

Grades are based on approximately 10% daily work, 40% assignments and 50% test scores.

GRADING SCALE

A = 100% - 90%, B = 89% - 80%, C= 79% - 70%, D = 69% - 60%, F = 59% - below

INCENTIVE PLAN

Every other week there will be a preferred activity time or preferred reward chose from a list developed by the class and approved by the teacher. Minutes may be earned by quick compliance with teacher's directions, etc. Minutes will not be earned when procedures and rules for behavior are not followed.

COURSE OBJECTIVES

Students will be able to:

1. Solve, graph and analyze linear, inequality and absolute value equations.
2. Find real or imaginary solutions to quadratic equations by graphing, factoring, completing the square and using the quadratic formula.
3. Perform operations on polynomials and solve by factoring and synthetic division.
4. Solve systems of equations by substitution, elimination and augmented matrices.
5. Perform operations on matrices and the inverse and determinants to solve problems.
6. Simplify radical and rational expressions and perform operations on real and complex numbers.
7. Identify, graph and write the equations for parabolas, circles, ellipses and hyperbolas.
8. Use tests to identify functions and state the domain and range.
9. Solve and graph logarithmic equations.
10. Use data analysis to predict outcomes and justify arguments.

POSITIVE AND NEGATIVE CONSEQUENCES

Positive

1. Reinforcement from teacher and points toward preferred activity time
2. Call or note to occupational teacher describing positive behavior.
3. Call or note to parents describing positive behavior.

Negative

1. Suspend instruction and call name. This is understood to constitute a warning.
2. Talk with student in hallway or after class.
3. Detention during break
4. Call to occupational teacher.
5. Phone call home
6. Referral to assistant director
7. In-school suspension
8. Conference with contract and/or suspension

Central Tech
Course Syllabus

ST00016 – CHEMISTRY

COURSE DESCRIPTION

This course is designed to develop the student's knowledge of the foundations of chemistry including mathematical problem-solving. Basic chemistry terminology, principles and patterns are presented.

Type of Course: Theory with Lab
Pathway: Science, Technology, Engineering & Mathematics
High School Credits: varies by high school
OHLAP Credit: Yes
OCAS Code: 5051
Total Contact hours: 120
Theory hours: 40
Lab hours: 80
Prerequisites: Algebra II (either completed or enrolled)

Instructor: Scott Makintubee
Phone: (918) 352-2551, Ext. 382
Email: scottm@centraltech.edu
Campus: Drumright

Campus Director: Dr. Anita Reynolds
Phone: (918) 224-9300
Email: anitar@centraltech.edu
Campus Assistant Directors:
Mrs. LaDonna Gear, Mr. Bruce McKinzie

REQUIRED TEXT, REFERENCES, AND MATERIALS

Text(s): College Physics, Serway & Faughn; 7th Edition
Supplies: 1, 1 or 1 ½ inch, 3 ring binder; Pencils; Blue or black ink pens

CLASS EVALUATION/GRADING POLICY

Grades will be assigned on a "points" basis. The student will accumulate points as the year progresses. At the end of each grading period, a letter grade will be assigned based on the percent of possible points the student has earned. The following scale will be used.

90 – 100	A
80 - 89	B
70 - 79	C
60 - 69	D
59 - 0	F

Points will be earned through the completion of class assignments, homework, participation, laboratory activities, tests and quizzes. Late assignments will not be accepted. Students are responsible for work missed during an absence and must complete the work in a timely manner according to school policy.

DAILY PERFORMANCE GRADE

In addition to the standard assignments previously described, you will receive a daily performance grade based on attendance, participation, proper use of class time and appropriate class progress.

GENERAL COURSE OBJECTIVES

1. Demonstrate safe laboratory procedures.
2. Be able to identify and properly use laboratory equipment.
3. Describe the structure of Atoms.
4. Relate atomic structure to properties of matter.
5. Identify types of and predict chemical reactions.
6. Realize that chemical reactions may release or consume energy.
7. Explain Conservation of Energy and Mass.
8. Solve stoiciometric problems.
9. Identify acids and bases.
10. Apply Gas Laws.
11. Demonstrate an understanding of how basic chemical principles are found and used
    in day-to-day life.
12. Explain how energy and matter interact.

Topics to be covered in this Course

Unit 1	Introduction to Chemistry and Matter Matter and Change – Measurements
Unit 2	Organization of Matter Atoms – Arrangement of Electrons – Periodic Law – Chemical Bonding
Unit 3	Language of Chemistry Chemical Formulas & Chemical Compounds – Chemical Equations & Reactions
Unit 4	Phases of Matter Physical Characteristics of Gases – Molecular Composition of Gases Liquids and Solids
Unit 5	Solutions and Their Behavior Solutions – Ions in Aqueous Solutions – Acids and Bases
Unit 6	Chemical Reactions Reaction Energy – Chemical Equilibrium
Unit 7	Organic and Nuclear Chemistry Carbon & Hydrocarbons – Other Organic Compounds – Nuclear Chemistry

Central Tech
Course Syllabus

ST00001 - HUMAN BODY SYSTEMS

COURSE DESCRIPTION

This course will engage students in the study of the processes, structures and interactions of human body systems. Important biomedical concepts in the course include: communication, transport of substances, locomotion, metabolic processes, identity, and protection. The central theme will focus on how the body systems work together to maintain homeostasis and good health. The systems will be studied as "parts of a whole," working together to keep the amazing human machine functioning at an optimal level. Students will design experiments, investigate the structures and functions of body systems, and use data acquisition software to monitor body functions such as muscle movement, reflex and voluntary actions, and respiratory operation. Exploring science in action, students will work through interesting real world cases and often play the role of biomedical professionals to solve medical mysteries. (PLTW HBS Curriculum, 2009)

Type of Course: Theory with Lab
Pathway: Science, Technology, Engineering & Mathematics
High School Credits: varies by high school
OHLAP Credit: No
OCAS Code: 8707
Total Contact hours: 120
Theory hours: 40
Lab hours: 80
Prerequisites: Biology I, Principles of Biomedical Science

Instructor: Denise Radcliff, MLT ASCP, NBCT
Phone: (918) 352-2551, Ext. 292
Email: deniser@centraltech.edu
Campus: Drumright

Campus Director: Dr. Anita Reynolds
Phone: (918) 224-9300
Email: anitar@centraltech.edu
Campus Assistant Directors:
Mrs. LaDonna Gear, Mr. Ron Tackett

REQUIRED TEXT, REFERENCES, AND MATERIALS

Text(s):
References:
Materials: PLTW HBS Curriculum , LabView Software, Inspiration Software
Estimated Cost for Materials: See Instructional Handbook
Uniforms/Tools: Lab Coat and Lab Notebook
Estimated Cost for Uniforms/Tools: See Instructional Handbook

COURSE COMPETENCIES

Competency	Assessment of Competency
Individuals who accept the responsibility of continuous self-evaluation will benefit from personal growth, professional development and increased employability.	Completion of examination with 70% accuracy.
Individual contributions to group processes facilitate the solving of complex problems and the achievement of common goals.	Completion of examination with 70% accuracy.
Mathematics is the body of knowledge used to describe the scientific principles that happen naturally in the world, and technology is the application of these principles to produce products and services to benefit society.	Completion of examination with 70% accuracy.

Skillful researchers are proficient with the technologies and strategies used to gather, organize, document, and disseminate information.	Completion of examination with 70% accuracy.
The use of the design process to analyze and solve problems has greatly improved the quality of, and the speed at which, new products are created.	Completion of Examination with 70% accuracy.
Project success is dependent on problem identification, planning, and the allocation of resources.	Completion of Examination with 70% accuracy.
Consideration of the ethical, environmental, social, and economic impacts of the engineering design process is essential to being a responsible, involved citizen.	Completion of Examination with 70% accuracy.
Critical thinking involves using a variety of established and original problem-solving techniques.	Completion of Examination with 70% accuracy.
In order to solve complex problems, the use of systems which monitor and correct performance must be developed.	Completion of Examination with 70% accuracy.
Understanding contemporary issues aids in determining the solutions to complex problems.	Completion of Examination with 70% accuracy.

COURSE ACTIVITIES

In this course students will:

- Complete activities, projects, and problems as directed by the curriculum.
- Perform research using Internet and class reference materials.
- Participate in class discussions regarding activities.
- Present research and laboratory findings via power point.
- Utilize safety precautions during laboratory experimentation.
- Develop skills as pertaining to laboratory experimentation.
- Perform laboratory procedures.
- Complete evaluations with 70% accuracy or higher.

GRADE POLICY

40% Activities, Projects, & Presentations
20% Evaluations
20% Laboratory Performance (Exempt in this course)

Central Tech Grading Scale

A = 90.00 – 100.00
B = 80.00 – 89.99
C = 70.00 – 79.99
D = 60.00 – 69.99
F = 0.00 – 59.99

COURSE OUTLINE

Unit	Topics and Competencies	Est. Time	Assessment
1	Identity	20 Hours	Completion of examination with 70% accuracy.
2	Communication	30 Hours	Completion of examination with 70% accuracy.
3	Power	20 Hours	Completion of examination with 70% accuracy.
4	Movement	20 Hours	Completion of examination with 70% accuracy.
5	Protection	20Hours	Completion of examination with 70% accuracy.
6	Homeostasis	10 Hours	Completion of examination with 70% accuracy.

INSTRUCTOR'S POLICY ON ABSENCES

Students should procure work prior to planned absences and initiate with instructor the procurement of missed work for unplanned absences before scheduled class time. Work not completed will result in the absence of points.

INSTRUCTOR'S LATE WORK POLICY

Late work will only be accepted due to absences involving sickness or planned events related to the student's home school or family. Late work will be submitted within the same number of days missed by the student for full credit. Work turned in the day after the due date will result in a lowering of the potential grade by 20%. Work turned in the second day after the due date will result in a lowering of the potential grade by 50%. Work will not be accepted after the third day.

OTHER LAB AND CLASSROOM POLICIES

Laboratory safety must be adhered to rigorously by students during all laboratory procedures. Laboratory safety procedure is posted in the laboratory area. Responsibility for laboratory station order and cleanliness before, during , and after laboratory procedures belongs to the students.

AMERICANS WITH DISABILITIES ACT (ADA)

According to the ADA, each adult student with a disability is responsible for notifying Central Technology Center of his/her disability and requesting accommodations. If you think you have a qualified disability and need classroom accommodations, contact the Campus Director located in Student Services. Please advise the instructor of your disability as soon as possible, to ensure timely implementation of appropriate accommodations. Faculty has an obligation to respond when they receive official notice of a disability from the Campus Director but are under no obligation to provide retroactive accommodations. To receive services, a student must submit appropriate documentation and complete an intake process during which the existence of a qualified disability is verified and reasonable accommodations are identified.

ACADEMIC DISHONESTY

Academic dishonesty or misconduct is neither condoned nor tolerated at Central Technology Center. Any student found guilty of academic dishonesty or misconduct shall be subject to disciplinary action. Academic dishonesty and/or misconduct includes, but is not limited to, the following actions: (1) Plagiarism: The representation of previously written, published or creative work as one's own; (2) Unauthorized Collaboration on Projects; (3) Cheating on Examinations; (4) Unauthorized Advance Access to Exams; (5) Fraudulent Alteration of Academic Materials; (6)Knowing Cooperation with Another Person in an Academically Dishonest Undertaking. Students are required to actively protect their work against misuse by others. For details, refer to The Central Technology Center Student Handbook available in Student Services.

STUDENT CONDUCT

Students are expected to cooperate in maintaining a classroom environment conducive to learning. Courteous and respectful behavior will be expected from all students each day. All pagers, cellular phones, computers, CD and MP3 players should be turned off. The use of tobacco in any form in Central Technology Center buildings is prohibited.

Central Tech
Syllabus

Class: Medical Interventions
Teacher: Denise Radcliff
Email: deniser@ctechok.org
Phone: 918-352-2551
Suggested Course Pre-Requisites: Biology, Algebra 2, PBS, HBS
Next Course in Sequence: Biomedical Innovations

Daily Required Materials: Blue or black pen, #2 pencil, colored pencils, markers, three ring binder with daily assignments, paper, and scientific calculator

Course Description: In the Medical Interventions course, students will investigate the variety of interventions involved in the prevention, diagnosis and treatment of disease as they follow the lives of a fictitious family. The course will explore how to prevent and fight infection, how to screen and evaluate the code in our DNA, how to prevent, diagnose and treat cancer, and how to prevail when the organs of the body begin to fail. Through these scenarios, students will be exposed to the wide range of interventions related to Immunology, Surgery, Genetics, Pharmacology, Medical Devices, and Diagnostics. Each family case scenario will introduce multiple types of interventions and will reinforce concepts learned in the previous two courses, as well as present new content. Interventions may range from simple diagnostic tests to treatment of complex diseases and disorders. Lifestyle choices and preventive measures are emphasized throughout the course as well as the important role scientific thinking and engineering design play in the development of interventions of the future. (PLTW 2010)

Teaching Methods: Students will work in groups or as individuals researching, experimenting, and solving biomedical scientific problems as related to the unit topics. Students will be required to use computers and laboratory technologies to accomplish these tasks. Periodically, students will be assessed through vocabulary quizzes and exams. Exams may be multiple choice or essay or both.

Unit Topics: How to Fight Infection, Screening Genes, Conquering Cancer, Prevailing When Organs Fail

Grading Policy: Grades in the Biomedical Program are earned through excellence in productivity, commitment to group success, superior investigative skills, and professionalism. Each day, students will have varying opportunities to earn points through projects and activities, career investigations, laboratory performance, presentations, group participation, vocabulary assessments, professional attire, and observance of laboratory safety.

Grade Evaluation through Percent of Total Points:
90-100 % = A
80-89 % = B
70-79 % = C
60-69 % = D
0-59 % = F

Quarterly grades will be determined based on the following categories:

Activities, Projects, Career Journals And Conclusion Questions	40%
Group Participation	10%
Laboratory Safety and Skills	10%
Quizzes	10 %
Unit Exams	30%

Behind Schedule Assignments:

1 Day	- 20%
2 Day	- 50%
3 Days or More	0%

What is Professional Attire?
On designated days at Central Tech and trips away from the facility students will be asked to wear professional dress. Professional dress includes slacks or skirts to the knee, shirts other than t-shirts, and closed toed shoes. During laboratory sessions lab coats and closed toed shoes are considered part required professional attire.

How to be Successful in the Biomedical Sciences :

- Attend class daily with an attitude of enthusiasm and a readiness to participate.
- Give and expect respect.
- Do not bring food or drink into the laboratory or computer work areas.
- Show continuous commitment to group members through diligence in work, by listening to all ideas presented, and by being present daily in class. **Absences will result in a student not benefiting from other group members productivity**.
- Collect all assignments, work, and research material. Keep them in an organized manner in individual notebooks.
- Never have cell phone out at any time during class or labs. Cell phones should only be used during breaks and outside of the classroom.
- Wear closed toed shoes in laboratory and be aware of all safety requirements during every laboratory procedure.
- Be responsible for any time not present during class including absences.
- Turn in only original work. Even though many ideas are generated in the group or from websites, each student's work must be original upon completion.

Central Tech
Course Syllabus

ST00010 –TRIGONOMETRY/PRE-CALCULUS

COURSE DESCRIPTION

In this course students will study, in depth, the concepts studied in College Algebra and Trigonometry, including: linear relations, polynomial equations, trigonometric functions, and logarithmic and exponential functions. Students will also study the theory of equations, conic sections, and the nature of graphs. An introduction to calculus will be included in this course.

Type of Course: Theory
Pathway: Science, Technology, Engineering & Mathematics
High School Credits: varies by high school
OHLAP Credit: Yes
OCAS Code: 4750/ 4612
Total Contact hours: 120
Theory hours: 120
Lab hours: 0
Prerequisites: Algebra II; Geometry (either completed or enrolled)

Instructor: Scott Makintubee
Phone: (918) 352-2551, Ext. 382
Email: scottm@centraltech.edu
Campus: Drumright

Campus Director: Dr. Anita Reynolds
Phone: (918) 224-9300
Email: anitar@centraltech.edu
Campus Assistant Directors:
Mrs. LaDonna Gear, Mr. Bruce McKinzie

REQUIRED TEXT, REFERENCES, AND MATERIALS

Text(s): Pre-Calculus: Graphical, Numerical, Algebraic, Demana, Waits, Foley and Kennedy; 7th Edition
Requirements: Loose Leaf Notebook; Ruler or straight edge for graphing; Graph paper (optional); Scientific Calculator (Graphing Calculator Recommended)

Homework

See Homework Guide

Weekly Schedule

The classes will be a mixture of lectures, lab explorations and guided practice and will vary according to the topic being covered. Each student is responsible for getting each day's notes and assignments even if the student is gone during the class period. All assignments must be turned in on or before the announced due date. The class will be conducted on a block schedule meeting every other day during the school week.

Exams

There will be 4-5 exams plus a final during the course of the semester.

Pre-Calculus Homework Guidelines

The weekly homework will include reading assignments and exercises. To be successful in this class, you will need to work on homework **daily**.

Reading Assignments/Outlines

I will expect you to read each section prior to the date that the material will be covered in class. As part of this reading assignment, you should outline each section and include it in your physics notebook.

The following is a guideline to use in outlining the section:
1. Write ½-1 page of thoughtful notes. Try to keep it under one page.
2. Include the definitions, formulas, and theorems that are in highlighted print.
3. Note the major concepts and ideas.
4. Include your own interpretation of definitions, formulas, and concepts. Provide creative examples on how to put these formulas and concepts to work.
5. Include any questions you may have.

Homework

1. Homework should be done in a timely manner. Daily participation and quizzes will be based on the assigned homework.
2. I do not want to see just the answer to the problem. I am really looking for the reasoning you used in arriving at an answer more than the answer itself. As a result, you must show **all** your work in order to receive credit for that problem.
3. Word Problems:
   State all the givens – include a picture and/or graph
   State what you are trying to find
   Identify all your variables and units
   Make an estimate
   Identify the steps or approach needed to solve the problem
   Logically follow the steps to solve the problem
   Check your answer with your estimate

4. If you are absent, you are still responsible for the reading, note taking, and homework the day it is due. Please make arrangements if you know you are going to be absent.
5. Neatness counts. If I can't tell what you did, you will not receive credit for the work.

GRADE POLICY

Homework:	40%
Exams:	40%
Final:	20%

Central Tech Grading Scale

A = 90.00 – 100.00
B = 80.00 – 89.99
C = 70.00 – 79.99
D = 60.00 – 69.99
F = 0.00 – 59.99

INSTRUCTOR'S POLICY ON ABSENCES

A student that is not in the classroom when role is called will be counted absent. If a student comes into class late, they should write their name, date, and the time that they came into class on a sheet of paper, and give it to the instructor at the end of the class period. The instructor will then make any changes in the role book that are necessary, at that time. Regular attendance is vital for a student to be successful in this class.

INSTRUCTOR'S LATE WORK POLICY

A student must be present to receive their assignment, and all assignments are due within the first five (5) minutes of class on the next class day. Late homework is not accepted for grading unless specific arrangements are established in advance with the instructor.

OTHER LAB AND CLASSROOM POLICIES

Unit tests will be of equal value, homework assignments and pop quizzes will be averaged together and count as one (1) test grade. The overall theory grade will be 50% of the final grade. Lab projects will account for 50% of the final grade. Lab projects are graded based on quantity, quality, and time required to complete assigned projects. Lab grades will be figured and recorded on at least 2 occasions; the final lab grade is then averaged with the theory grade.

AMERICANS WITH DISABILITIES ACT (ADA)

According to the ADA, each adult student with a disability is responsible for notifying Central Technology Center of his/her disability and requesting accommodations. If you think you have a qualified disability and need classroom accommodations, contact the Campus Director located in Student Services. Please advise the instructor of your disability as soon as possible, to ensure timely implementation of appropriate accommodations. Faculty has an obligation to respond when they receive official notice of a disability from the Campus Director but are under no obligation to provide retroactive accommodations. To receive services, a student must submit appropriate documentation and complete an intake process during which the existence of a qualified disability is verified and reasonable accommodations are identified.

ACADEMIC DISHONESTY

Academic dishonesty or misconduct is neither condoned nor tolerated at Central Technology Center. Any student found guilty of academic dishonesty or misconduct shall be subject to disciplinary action. Academic dishonesty and/or misconduct includes, but is not limited to, the following actions: (1) Plagiarism: The representation of previously written, published or creative work as one's own; (2) Unauthorized Collaboration on Projects; (3) Cheating on Examinations; (4) Unauthorized Advance Access to Exams; (5) Fraudulent Alteration of Academic Materials; (6) Knowing Cooperation with Another Person in an Academically Dishonest Undertaking. Students are required to actively protect their work against misuse by others. For details, refer to The Central Technology Center Student Handbook available in Student Services.

STUDENT CONDUCT

Students are expected to cooperate in maintaining a classroom environment conducive to learning. Courteous and respectful behavior will be expected from all students each day. All pagers, cellular phones, computers, CD and MP3 players should be turned off. The use of tobacco in any form in Central Technology Center buildings is prohibited.

Class: Microbiology
Teacher: Denise Radcliff
Email: deniser@centraltech.edu
Phone: 918-352-2551 ext. 351

Daily Required Materials: Microbiology by Robert W. Bauman), blue or black pen, #2 pencil, colored pencils, and markers, three ring binders with daily assignments, paper, and scientific calculator.

Course Description: This course guides students through a brief history of microbiology, builds an understanding of the relationship between microorganisms and the chemistry of their environments, and allows for an exploration of the structures and functions of microorganisms. Students will classify and characterize prokaryotes, microscopic eukaryotes, and viruses. Diseases caused by microscopic pathogens will be discussed in correlation with the body systems that they affect.

Teaching Methods: Students will work as individuals or in groups researching, experimenting, and solving problems as related to microbiology. Students will be required to use computers and laboratory technologies to accomplish these tasks.

Grading Policy: Grades in microbiology are earned through excellence in productivity, investigative skills, and professionalism. Each day, students will have varying opportunities to earn points through projects and activities, laboratory performance, presentations, vocabulary assessments, and observance of laboratory safety.

Grade Evaluation through Percent of Total Points:

90-100 %= A

80-89 % = B

70-79 % = C

60-69 % = D

0-59 % = F

Quarterly grades will be determined based on the following categories:

Activities, Papers, and Projects	40%
Laboratory Safety and Skills	30%
Quizzes and Exams	30%

Behind Schedule Assignments	**Points Available**
1 Day	80%
2 Day	50%
3 Days or More	0%

How to be Successful in the Biomedical Program:

- Attend class daily with an attitude of enthusiasm and a readiness to participate.
- Respect fellow classmates and instructor at all times.
- Do not bring food or drink into the classroom.
- Show continuous commitment to group members through diligence in work, by listening to all ideas presented, and by being present daily in class. Absences will result in a student not benefiting from other group members productivity.
- Collect all assignments, work, and research material. Keep them in an organized manner in individual notebooks.
- Never have cell phone out at any time during class or labs. Cell phones should only be used during breaks and outside of the classroom.
- Wear closed toed shoes in laboratory and be aware of all safety requirements during every laboratory procedure.
- Be responsible for any time not present during class including absences.
- Turn in only original work. Even though many ideas are generated in the group or from websites, each student's work must be original upon completion.

Central Tech
Course Syllabus

BIOMEDICAL INNOVATIONS

COURSE DESCRIPTION

In this capstone course, students apply their knowledge and skills to answer questions or solve problems related to the biomedical sciences. Students design innovative solutions for the health challenges of the 21st century as they work through progressively challenging open-ended problems, addressing topics such as clinical medicine, physiology, biomedical engineering, and public health. They have the opportunity to work on an independent project and may work with a mentor or advisor from a university, hospital, physician's office, or industry. Throughout the course, students are expected to present their work to an adult audience that may include representatives from the local business and healthcare community. (PLTW, 2010)

Type of Course: Theory and Laboratory
Total Contact hours: 120 **Theory hours:** 80 **Lab hours:** 40

Prerequisites: Biology I, Principles of Biomedical Science, Human Body Systems, Medical Interventions

Instructor: Denise Radcliff MLT ASCP, NBCT **Phone:** (918) 352-2551, Ext. 351
Instructor email: deniser@centraltech.edu

Campus: Drumright
Campus Director: Dr. Anita Reynolds
Campus Assistant Director(s): Ms. LaDonna Gear

REQUIRED TEXT, REFERENCES, AND MATERIALS

Text(s):
References:

Materials: PLTW BI Curriculum , LabView Software, Inspiration Software
Estimated Cost for Materials:
See Program Handbook
Uniforms/Tools:
Lab Coat and Lab Notebook
Estimated Cost for Uniforms/Tools:
See Program Handbook

COURSE COMPETENCIES

Competency	Assessment of Competency
Individuals who accept the responsibility of continuous self-evaluation will benefit from personal growth, professional development and increased employability.	Completion of examination with 70% accuracy.
Individual contributions to group processes facilitate the solving of complex problems and the achievement of common goals.	Completion of examination with 70% accuracy.
Mathematics is the body of knowledge used to describe the scientific principles that happen naturally in the world, and technology is the application of these principles to produce products and services to benefit society.	Completion of examination with 70% accuracy.
Skillful researchers are proficient with the technologies and strategies used to gather, organize, document, and disseminate information.	Completion of examination with 70% accuracy.
The use of the design process to analyze and solve problems has greatly improved the quality of, and the speed at which, new products are created.	Completion of Examination with 70% accuracy.
Project success is dependent on problem identification, planning, and the allocation of resources.	Completion of Examination with 70% accuracy.
Consideration of the ethical, environmental, social, and economic impacts of the engineering design process is essential to being a responsible, involved citizen.	Completion of Examination with 70% accuracy.
Critical thinking involves using a variety of established and original problem-solving techniques.	Completion of Examination with 70% accuracy.
In order to solve complex problems, the use of systems which monitor and correct performance must be developed.	Completion of Examination with 70% accuracy.
Understanding contemporary issues aids in determining the solutions to complex problems.	Completion of Examination with 70% accuracy.

COURSE ACTIVITIES

In this course students will:

- Complete activities, projects, and problems as directed by the curriculum.
- Perform research using Internet and class reference materials.
- Participate in class discussions regarding activities.
- Present research and laboratory findings via power point.
- Utilize safety precautions during laboratory experimentation.
- Develop skills as pertaining to laboratory experimentation.
- Perform laboratory procedures.
- Complete evaluations with 70% accuracy or higher.

GRADE POLICY

40% Activities, Projects, & Presentations
20% Evaluations
20% Laboratory Performance

Central Tech
Grading Scale

A = 90.00 – 100.00
B = 80.00 – 89.99
C = 70.00 – 79.99
D = 60.00 – 69.99
F = 0.00 – 59.99

COURSE OUTLINE

Unit	Topics and Competencies	Est. Time	Assessment
1	ER	10 Hours	Completion of examination with 70% accuracy.
2	Exploring Human Physiology	10 Hours	Completion of examination with 70% accuracy.
3	Medical Innovations	10 Hours	Completion of examination with 70% accuracy.
4	Water Contamination	10 Hours	Completion of examination with 70% accuracy.
5	Public Health	10 Hours	Completion of examination with 70% accuracy.
6	Molecular Biology	20 Hours	Completion of examination with 70% accuracy.
7	Forensic Autopsy	10 Hours	Completion of examination with 70% accuracy.
8	Independent Project	30 Hours	Completion of examination with 70% accuracy.

INSTRUCTOR'S POLICY ON ABSENCES

Students should procure work prior to planned absences and initiate with instructor the procurement of missed work for unplanned absences before scheduled class time. Work not completed will result in the absence of points.

INSTRUCTOR'S LATE WORK POLICY

Late work will only be accepted due to absences involving sickness or planned events related to the student's home school or family. Late work will be submitted within the same number of days missed by the student for full credit. Work turned in the day after the due date will result in a lowering of the potential grade by 20%. Work turned in the second day after the due date will result in a lowering of the potential grade by 50%. Work will not be accepted after the third day.

OTHER LAB AND CLASSROOM POLICIES

Laboratory safety must be adhered to rigorously by students during all laboratory procedures. Laboratory safety procedure is posted in the laboratory area. Responsibility for laboratory station order and cleanliness before, during , and after laboratory procedures belongs to the students.

AMERICANS WITH DISABILITIES ACT (ADA)

According to the ADA, each adult student with a disability is responsible for notifying Central Technology Center of his/her disability and requesting accommodations. If you think you have a qualified disability and need classroom accommodations, contact the Campus Director located in Student Services. Please advise the instructor of your disability as soon as possible, to ensure timely implementation of appropriate accommodations. Faculty has an obligation to respond when they receive official notice of a disability from the Campus Director but are under no obligation to provide retroactive accommodations. To receive services, a student must submit appropriate documentation and complete an intake process during which the existence of a qualified disability is verified and reasonable accommodations are identified.

ACADEMIC DISHONESTY

Academic dishonesty or misconduct is neither condoned nor tolerated at Central Technology Center. Any student found guilty of academic dishonesty or misconduct shall be subject to disciplinary action. Academic dishonesty and/or misconduct includes, but is not limited to, the following actions: (1) Plagiarism: The representation of previously written, published or creative work as one's own; (2) Unauthorized Collaboration on Projects; (3) Cheating on Examinations; (4) Unauthorized Advance Access to Exams; (5) Fraudulent Alteration of Academic Materials; (6)Knowing Cooperation with Another Person in an Academically Dishonest Undertaking. Students are required to actively protect their work against misuse by others. For details, refer to The Central Technology Center Student Handbook available in Student Services.

STUDENT CONDUCT

Students are expected to cooperate in maintaining a classroom environment conducive to learning. Courteous and respectful behavior will be expected from all students each day. All pagers, cellular phones, computers, CD and MP3 players should be turned off. The use of tobacco in any form in Central Technology Center buildings is prohibited.

Oklahoma School of Science and Mathematics
Drumright Regional Center
AP CALCULUS AB SYLLABUS
2011-2012

Instructor: John Mullen

Overview: This course will provide a multi-representational study of basic calculus concepts using geometric, analytic, numeric, and verbal methods. The course is taught at the collegiate level and it is our full intent for students to receive college credit for Calculus II through the Advanced Placement program tests. The topics covered will be Local Linearity, Functions and Limits, the Derivative, the Integral, and various applications of differentiation and integration.

Text: Calculus by Dale Varberg-Edwin J. Purcell 9th Edition

Weekly Schedule:

The classes will be a mixture of lectures, lab explorations and guided practice and will vary according to the topic being covered. Each student is responsible for getting each day's notes and assignments even if the student is gone during the class period. All assignments must be turned in on or before the announced due date.

Exams: There will be 4-5 exams plus a final during the course of the semester. Each exam will be cumulative with the greatest emphasis being placed on the most current material.

Grading:		
	Homework/Quizzes:	30%
	Portfolio:	10%
	Exams:	40%
	Final:	20%

Calculator: The calculator should be used to experiment, interpret results, and verify solutions obtained analytically. The four specific concepts that each student should learn to do with the calculator include: graphing a function in an arbitrary window, finding the derivative of a function at a numerical value, evaluating an indefinite integral, and finding the numerical roots of an equation.

Curricular Requirements: Students should be able to show understanding of the theory and the application of functions, limits, derivatives, integrals and sequences/series in graphical, numerical and analytical situations.

The following syllabus will provide the content for this experience.

I) Pre-calculus review (approximate time 4 weeks)

This review will consist of an overview of:

a) Trigonometry
b) Equations
c) Polynomial and rational functions
d) Exponential and logarithmic functions
e) Analytic geometry.

II) Limits (approximate time 2-3 weeks)

a) Graphical and intuitive meaning of a limit of a function.
b) Finding limits graphically, numerically using graphing calculators. Using algebraic methods (factoring etc.)
c) Graphical understanding of continuity
d) Using limits to determine continuity of a function.
e) Application of The Intermediate Value Theorem
f) Applying limits to determine vertical and horizontal asymptotes.

III) The Derivative (approximate time 10 weeks)

a) Using the definition of the derivative
b) Using the relationship between the derivative and continuity.
c) Using the rules for the derivative (constant, identity, power, sum, difference, product, quotient, chain)
d) Using implicit and logarithmic differentiation
e) Applying methods of approximating the derivative
f) Applications of the derivative: (related rate problems, maximum and minimum problems; intervals of increasing and decreasing, concavity, inflection points, local and absolute maximum and minimum for functions; equations of tangent lines to graphs; finding velocity, speed and acceleration).
g) Graphical relationships of $f(x)$, $f'(x)$, and $f''(x)$.
h) Application of the Mean Value Theorem for the derivative
i) Memorizing the derivative of: trigonometric functions, exponential functions, logarithmic functions
j) Using L'Hopitals' rules
k) Using Newton's method of approximating roots of a function
l) Drawing slope fields for differential equations
m) Using Euler's method of approximating a functional value.

IV) The Integral (approximate time 10 weeks)

a) Using the definition of the integral and the power rule for antidifferentiation.
b) Solving separable differential equations
c) Applying the Fundamental Theorems of Calculus
d) Use the various properties of the integral (linearity, interval addition property)
e) Use the Mean Value Theorem for integrals.
f) Use methods of integration (u, du substitution, trigonometric substitution, integration by parts, partial fractions)
g) Use methods of approximating integrals (Riemann sums, Trapezoidal rule, Simpsons' Rule, algebraic sum of area)
h) Application of integration (areas bounded by curves, finding velocity, displacement; volumes of solids by disks, washers, shells and cross sections; arc length, surface area, work, word problems dealing with rates, average value of a function)
i) Finding the improper integrals
j) Memorize the integral of (Trigonometric functions, exponential functions, logarithmic function, expression whose integral is the inverse sine and tangent and secant functions)

V) Practice AP Calculus exams (approximate time 5 weeks)

Three AP Calculus BC exams will be given as a review for the AP exam given in May by the College Board. The free response part of the practice exams will be from past AP exams and the multiply choice part will be from the Princeton review materials.

Calculus Homework Guidelines

The weekly homework will include reading assignments and exercises. To be successful in this class, you will need to work on homework **daily**.

Reading Assignments/Outlines

I will expect you to read each section prior to the date that the material will be covered in class. As part of this reading assignment, you should outline each section and include it in your calculus portfolio.

The following is a guideline to use in outlining the section:

1. Write ½-1 page of thoughtful notes. Try to keep it under one page.
2. Include the definitions, formulas, and theorems that are in highlighted print.
3. Note the major concepts and ideas.
4. Include your own interpretation of definitions, formulas, and concepts. Provide creative examples on how to put these formulas and concepts to work.
5. Include any questions you may have.

Homework:

1. Homework should be done in a timely manner. Daily participation and quizzes will be based on the assigned homework.
2. I do not want to see just the answer to the problem. I am really looking for the reasoning you used in arriving at an answer more than the answer itself. As a result, you must show **all** your work in order to receive credit for that problem.
3. Word Problems:
   State all the givens – include a picture and/or graph
   State what you are trying to find
   Identify all your variables and units
   Make an estimate
   Identify the steps or approach needed to solve the problem
   Logically follow the steps to solve the problem
   Check your answer with your estimate
4. If you are absent, you are still responsible for the reading, note taking, and homework the day it is due. Please make arrangements if you know you are going to be absent.
5. Neatness counts. If I can't tell what you did, you will not receive credit for the work.

Portfolio:

Your calculus portfolio should include three sections: homework, tests, and section outlines (notes).
Your portfolio will be checked at the end of each nine-week grading period. The portfolio will be checked for **completeness** and for **organization**.

Advanced Placement Biology
Course Syllabus
Instructor: Nancy Overton

Textbook
- Biology with Mastering Biology (9th Edition); Campbell and Reece

Additional Resources
- AP® Biology Lab Manual for Students (2001)
- Supplemental Labs and Activities – Collected from a variety of resources

Course Description:
Advanced Placement Biology (AP Biology) is designed to be the equivalent of a college introductory course for biology majors. Upon successful completion of the course students should be able to enter college prepared for college-level course work. AP Biology is a fast paced course that emphasizes molecules and cells, heredity and evolution, as well as organisms and populations. As a college level course, advanced lab techniques will be taught and current bioethical issues will be discussed. Students will learn through laboratory and lecture methods using group and individual activities, cooperative learning, presentations, and technology to enhance the learning environment. Students will be challenged to develop a conceptual framework and an appreciation of science as a process. This academic course will follow a block schedule. The AP Biology course will meet over the two nine week blocks with classes meeting five days a week for 85 minutes a day. Due to the shortened length of ...e this course will be fast pace with structured time schedules.

...re-requisites:
- Biology I
- Chemistry – Highly Recommended

Course Objectives/Goals:
1. Teach students practical scientific skills, which they can use to investigate, study, and explain the world around them while developing an appreciation for science.
2. Help students develop a conceptual framework for modern biology by developing a deeper understanding of molecules and cells, heredity and evolution, and organisms and populations.
3. Encourage the spirit of scientific investigation and with it the attitudes of accuracy in thought and work.
4. Teach students to think critically and creatively.
5. Encourage students to work cooperatively together.

Themes, Topic, and Concepts
Themes are the overarching features of biology that are applied throughout the curriculum. Topics are the specific subjects covered in biology and concepts are the most important ideas that form the understanding of a particular topic. Emphasizing concepts over facts makes the content of this course more meaningful and less overwhelming. This course will have more structure and meaning when key ...ncepts for each topic are place into a broader context or unifying theme.

Major Themes in AP Biology:
1. Science as a Process
2. Evolution

3. Energy Transfer
4. Continuity and Change
5. Relationship of Structure to Function
6. Regulation
7. Interdependence in Nature
8. Science, Technology, and Society

Explanation of Major Themes

I. **Science as a Process**—Science is a way of knowing. It can involve a discovery process using inductive reasoning, or it can be a process of hypothesis testing.

Example: *The theory of evolution was developed based on observation and experimentation*

II. **Evolution** - Evolution is the biological change of organisms that occurs over time and is driven by the process of natural selection. Evolution accounts for the diversity of life on Earth.

Example*: Widespread use of antibiotics has selected for antibiotic resistance in disease-causing bacteria.*

III. **Energy Transfer** – Energy is the capacity to do work. All living organisms are active (living) because of their abilities to link energy reactions to the biochemical reactions that take place within their cells

Example*: The energy of sunlight, along with carbon dioxide and water, allows plant cells to make organic materials, synthesize chemical energy molecules, and ultimately release oxygen to the environment.*

IV. **Continuity and Change** - All species tend to maintain themselves from generation to generation using the same genetic code. However, there are genetic mechanisms that lead to change over time, or evolution

Example*: Mitosis consistently replicates cells in an organism; meiosis (and hence sexual reproduction) results in genetic variability.*

V. **Relationship of Structure and Function** - The structural levels from molecules to organisms ensure successful functioning in all living organisms and living systems.

Example: *Aerodynamics of a bird's wing permits flight.*

VI. **Regulation** - Everything from cells to organisms to ecosystems is in a state of dynamic balance that must be controlled by positive or negative feedback mechanisms.

Example*: Body temperature is regulated by the brain via feedback mechanisms.*

VII. **Interdependence in Nature** - Living organisms rarely exist alone in nature.

Example*: Microscopic organisms can live in a symbiotic relationship in the intestinal tract of another organism; the host provides shelter and nutrients, and the microorganisms digest the food.*

VIII. **Science, Technology, and Society** - Scientific research often leads to technological advances that can have positive and/or negative impacts upon society as a whole.

Example: *Biotechnology has allowed the development of genetically modified plants.*

›pic Outline

lolecules and Cells . . . . . 25% (23.5 Days)

A. Chemistry of Life . . . . . .7% (6.5 Days)

- Water
- Organic molecules in organisms
- Free energy changes
- Enzymes

B. Cells . . . . . .10% (9.5 Days)

- Prokaryotic and eukaryotic cells
- Membranes
- Subcellular organization
- Cell cycle and its regulation

C. Cellular Energetics . . . . . 8% (7.5 Days)

- Coupled reactions
- Fermentation and cellular respiration
- Photosynthesis

II. Heredity and Evolution . . . . . 25% (23.5 Days)

A. Heredity . . . . . 8% (7.5 Days)

- Meiosis and gametogenesis
- Eukaryotic chromosomes
- Inheritance patterns

B. Molecular Genetics . . . . . 9% (8.5 Days)

- RNA and DNA structure and function
- Gene regulation
- Mutation
- Viral structure and replication
- Nucleic acid technology and applications

C. Evolutionary Biology . . . . . 8% (8.5 Days)

- Early evolution of life
- Evidence for evolution
- Mechanisms of evolution

III. Organisms and Populations . . . . . 50% (47 Days)

A. Diversity of Organisms . . . . . .8% (8.5 Days)

- Evolutionary patterns
- Survey of the diversity of life
- Phylogenetic classification
- Evolutionary relationships

B. Structure and Function of Plants and Animals . . . . . 32% (30 Days)

- Reproduction, growth, and development
- Structural, physiological, and behavioral adaptations
- Response to the environment

C. Ecology . . . . . 10% (9.5 Days)

- Population dynamics
- Communities and ecosystems

- Global issues

Biology Lab Topics (The Dirty Dozen)

Since this is a course designed to prepare students for college level biology course work a lab component is necessary. Since one fourth to one third of the credit in most college introductory biology course is derived from lab work, it follows that the approximately same degree of emphasis should be placed on laboratory work in this AP course. The following labs will be covered:

1. Diffusion and Osmosis
2. Enzyme Catalysis
3. Mitosis and Meiosis
4. Plant Pigments and Photosynthesis
5. Cell Respiration
6. Molecular Biology
7. Genetics of Organisms
8. Population Genetics and Evolution
9. Transpiration
10. Physiology of the Circulatory System
11. Animal Behavior
12. Dissolved Oxygen and Aquatic Primary Productivity

In addition to the above listed lab exercises, teacher-generated labs will be used whenever possible and appropriate. Students will complete a lab report for each experiment. Lab reports will follow a specific format given in class.

Assessment The students are assessed in a variety of ways throughout the course. Students will have daily assessments through questions, discussion, and viewing student demonstrations as related to the topic being covered. Unit exams will be given which will include multiple choice questions and free – response essay questions.

Tentative Course Outline:

Unit One: Chemistry of Life (6.5 Days)

I. **Content and Skills Taught:**
   a. Elements of Life
   b. Atomic Structure
   c. Weak Chemical Bonds
   d. Chemical Reactions and Bonding
   e. Polarity of Water
   f. Properties of Water
   g. pH and Living Organisms
   h. Carbon Backbone for Macromolecules
   i. Functional Groups
   j. Macromolecules as Polymers
   k. Metabolic Pathways
   l. Transformation of Energy
   m. Free Energy
   n. ATP Powering Important Cellular Work
   o. Enzymes

II. **Major Assignments and/or Assessments**
   a. Study Guide and Reading Assignments
      i. Chapter 2: The Chemical Context of Life
      ii. Chapter 3: Water and the Fitness of the Environment
      iii. Chapter 4: Carbon and Molecular Diversity of Life

iv. Chapter 5: The Structure and Function of Macromolecules
v. Chapter 8: An Introduction to Metabolism

b. Unit Exam: Multiple Choice and Free Response Essay Questions

III. Activities and Laboratory Exercises

a. Table Tales Activity
b. Building Biological Molecules w/ Marshmallows and Toothpicks
c. Building Macromolecules from Paper Monomers
d. Macromolecule Project
e. Toothpickase Lab (Pre-Lab)
f. AP Biology Lab #2 – Enzyme Catalysis

Unit Two: Cells and Cellular Energetics (17 Days)

I. Content and Skills Taught

a. Comparison of Prokaryotic and Eukaryotic Cells
b. Exploration of Each Cell Organelle – Structure and Function
c. Characteristics of Cell Membrane
d. Passive Transport – Osmosis, Diffusion, Role of Proteins
e. Active Transport
f. Cell Respiration – Aerobic, Anaerobic Pathways
g. Glycolysis, Krebs, Cycle, Electron Transport Chain
h. Photosynthesis and Chloroplasts
i. Light and Dark Reactions of Photosynthesis
j. Cell Communication
k. Cell Division – Mitosis and Meiosis (Compare and Contrast)

II. Major Assignments and/or Assessments

a. Study Guide and Reading Assignments
   i. Chapter 6: Tour of the Cell
   ii. Chapter 7: Membrane Structure and Function
   iii. Chapter 9: Cellular Respiration: Harvesting Chemical Reactions
   iv. Chapter 10: Photosynthesis
   v. Chapter 11: Cell to Cell Communication
   vi. Chapter 12: The Cell Cycle
b. Unit Exam: Multiple Choice and Free Response Essay Questions

III. Activities and Laboratory Exercises

a. Cell-A-Bration Exercise w/ Microscopes
b. Tour of the Cell Brochure
c. AP Biology Lab 1: Diffusion and Osmosis
d. Cell Respiration Concept Map
e. AP Biology Lab 5: Cellular Respiration
f. Photosynthesis Concept Map
g. AP Biology Lab 4: Plant Pigments and Photosynthesis
h. Essay Over Cell Communication – Peer Reviewed
i. Pre-Lab Exercise Modeling Mitosis and Meiosis w/ Paper Chromosomes
j. AP Biology Lab 3: Mitosis and Meiosis

Unit Three: Heredity and Molecular Genetics (23.5 Days)

I. Content and Skills Taught

a. Offspring Acquire Genes from Parents
b. Asexual vs. Sexual Reproduction
c. Review of Meiosis
d. Evolutionary Adaptation Dependent on Genetic Variation
e. Mendel's Research and Experiments

f. Law of Segregation and Independent Assortment
g. Genotype vs. Phenotype
h. Pedigree Reading and Analysis
i. Linked Genes
j. DNA Properties and Replication
k. Transcription and Translation
l. Viral Structure and Replication
m. Mutations and Cancer
n. DNA Technology

II. Major Assignments and Assessments

a. Study Guide and Reading Assignments:
   i. Chapter 13 Meiosis and Sexual Life Cycle
   ii. Chapter 14: Mendel and the Gene Idea
   iii. Chapter 15: Chromosomal Basis of Inheritance
   iv. Chapter 16: The Molecular Basis of Inheritance
   v. Chapter 17: From Gene to Protein
   vi. Chapter 18: The Genetics of Viruses and Bacteria
   vii. Chapter 19: Eukaryotic Genomes
   viii. Chapter 20: DNA Technology and Genomics
b. Unit Exam: Multiple Choice and Free Response Essay Questions

III. Activities and Laboratory Exercises

a. Genetics Unit Project – Create and Analyze Pedigree; Punnett Square and Probabilities
b. Dihybrid Crosses Using Punnett Squares
c. Genetic Problem Solving
d. Pre Lab Exercise: Restriction Enzyme Cleavage of DNA (paper model)
e. AP Biology Lab 6: Molecular Biology: Restricition Enzyme Cleavage of DNA and Electrophoresis
f. AP Biology Alternative Lab 7: Genetics of Plants

Unit Four: Diversity of Organisms thru Evolution (17 Days)

I. Content and Skills Taught'

a. Darwin's Theory and Proposals from Origin of Species
b. Evidence for Evolution (homologous structures, DNA, rock layers, analogous structrures,etc)
c. Conditions of Early Earth and Fossil Record
d. Eukaryotic Cells Arise from Symbiosis
e. Population Genetics – Hardy Weinberg Principle
f. Mutations and Sexual Recombination Leads to Evolution
g. Natural Selection, Genetic Drift, Gene Flow
h. Speciation
i. Macroevolutionary Change
j. Phylogenetic Systematics Connecting Classification to Evolutionary History

II. Major Assignments and/or Assessments

a. Study Guide and Reading Assignments:
   i. Chapter 22: Descent with Modification
   ii. Chaper 23: The Evolution of Populations
   iii. Chapter 24: The Origin of Species
   iv. Chapter 25: Phylogeny and Systematics
   v. Chapter 26: The Tree of Life: An Introduction to Biological Diversity
b. Unit Exam: Multiple Choice and Free Response Essay Questions

III. Activities and Laboratory Exercises

a. Hardy Weinberg Practice Problems

b. Comparing and Contrasting Bones of Various Organisms
c. Phylogeny Webquest
d. Students will create diagrams depicting phylogenies of various organisms over time
e. Film: Evolution
f. Bottleneck Game
g. AP Lab 8: Population Genetics and Evolution

Unit Five: Structure and Function of Plants (15 Days)

I. Content and Skills Taught

a. Structural, Chemical, and Reproductive Adaptations that Allowed Plants to Inhabit Land
b. History of Terrestrial Adaptation Key to Plant Diversity
c. Plants Evolved from Green Algae
d. Alternation of Generations
e. Bryophytes and Embryophytes
f. Gametophytes of seed plant vs. Gametophytes of Seedless Vascular Plants
g. Seed Replaces Spore as Means of Dispersing Offspring
h. Vascular Tissue in Terrestrial Plants
i. Flower is Reproductive Adaptation of Angiosperms

II. Major Assignments and/or Assessments

a. Reading and Study Guide Assignments
    i. Chapter 29: Plant Diversity I: How Plants Colonized Land
    ii. Chapter 30: Plant Diversity : The Evolution of Seed Plants
    iii. Chapter 35: Plant Structure, Growth, and Development
    iv. Chapter 36: Transport in Vascular Plants
    v. Chapter 37-39 (Selected Passages)
    vi. Chapter 31: Fungi
b. Unit Exam: Multiple Choice and Free Response Essay Questions

III. Activities and Laboratory Exercises:

a. Diagram and Coloring of Plant Structural Components
b. Plant Type and Part Classification Using Microscopes and Plant Samples
c. Vine/Shrub/Tree Identification Exercise at a Local Park
d. AP Lab 9: Transpiration

Unit Six: Structure and Function of Animals (15 Days)

I. Content and Skills Taught

a. Animals are Multicellular, Heterotrophic, Eukaryotes w/ tissues that develop from embryonic layers
b. Overview of Invertebrae Phyla
c. Classification of Vertebrates
d. Animal Form and Function Correlated to All Levels of Organization
e. Thermoregulation
f. Homeostatic Mechanisms
g. Circulatory Systems as Reflection of Phylogeny
h. Immune System
i. Osmoregulation
j. Nitrogenous Waste Management
k. Structure and Function of Kidney
l. Relationship Between Endocrine and Reproductive Systems

II. Major Assignments and/or Assessments

a. Reading and Study Guide Assignments
    i. Chapter 32: An Introduction to Animal Diversity
    ii. Chapter 33: Invertebrates

iii. Chapter 34: Vertebrates
iv. Chapter 40: Basic Principles of Animal Form and Function
v. Chapter 41: Animal Nutrition
vi. Chapter 42: Circulation and Gas Exchange
vii. Chapter 43-49: Selected Passages

b. Unit Exam: Multiple Choice and Free Response Essay Questions

III. Activities and Laboratory Exercises

a. Classification of Animals Using Preserved Speciments
b. Animal Research Project: Classification, Unique Characteristics, etc.
c. AP Lab 10: Physiology of the Circulatory System
d. Listening to Heartbeat and Taking Blood Pressure and Factors Affecting Each

Unit Seven: Ecology (9.5 Days)

I. Content and Skills Taught

a. Ecology is the Interactions Between Organisms and the Environment
b. Limiting Factors of Species
c. Abiotic and Biotic Factors
d. Animal Behavior and Genetic Components
e. Population Density, Dispersion, and Demography
f. The Exponential Growth Model
g. Competition, Predation, Symbiotic Relationships
h. Ecosystems and Physical and Chemical Factors that Limit Them
i. Human Activities Affecting Earth's Biodiversity

II. Major Assignments and/or Assessments

a. Reading and Study Guide Assignments
i. Chapter 50: An Introduction to Ecology and the Biosphere
ii. Chapter 51: Behavioral Ecology
iii. Chapter 54: Ecosystems
iv. Chapters 52,53, and 55: Selected Passages
b. Unit Exam: Multiple Choice and Free Response Essay Questions

III. Activities and Laboratory Exercises

a. Population Activity: My Family in 100 Years
b. Webquest: Interdependence Shuffle
c. Ecosystem Research Project: Select ecosystem and present information to class
d. AP Lab 11: Animal Behavior
e. AP Lab 12: Dissolved Oxygen and Aquatic Primary Productivity

Grading

Grades will be based on the following weighted scale.

- Tests/Quizzes: 30%
- Labs/Activities: 20%
- Daily Assignments: 20%
- Starter Questions: 10%
- Projects: 20%

Once grades are calculated using the above weights the following grading scale will be used to assign letter grades:

- A = 90.00 – 100.00
- B = 80.00 – 89.99
- C = 70.00 – 79.99
- D = 60.00 – 69.99

- F = 0.00 - 59.99

pplies:

3-ring binder
Notebook Paper
Pencil/Pen
Colored Pencils

Rules, Expectations, and Procedures:

- **Be on time!** You must be in your seat with all materials needed to work when the bell rings.
- **Practice safety at all times!** No horseplay, throwing items, clean up messes or accidents, etc. If you break something notify your teacher immediately. Failure to practice safety within the classroom may result in the following; detention, no credit for assignment, office referral, etc.
- **RESPECT!** No cussing or using inappropriate language. No fighting or "play fighting"; keep your hands to yourself. No bullying. Failure to show respect towards classmate and/or the teacher will result in removal from classroom, detention, or office referral.
- **Turn papers in with the following information in the upper right hand corner of your paper:** Name, Date, and Name of Assignment
- **Be cooperative!**
- **Participate!** Participate!
- **Enjoy the learning process** – Have Fun!
- **Use proper writing and grammar in class! (Points will be taken off!)**

her Classroom Policies:

1. **Late Work** – NOT accepted unless specific arrangements have been made with the instructor.
2. **Makeup Work** –
   a. If you are absent it is YOUR responsibility to obtain any assignments you missed. DO NOT disrupt class to do this! Before school, break time, lunch, and after school are appropriate times to do this.
   b. If absent for a lab or activity you must make special arrangement to come in and make the assignment up or receive an alternative assignment.

ACADEMIC DISHONESTY

Academic dishonesty or misconduct is neither condoned nor tolerated. Any student found guilty of academic dishonesty or misconduct shall be subject to disciplinary action. Academic dishonesty and/or misconduct includes, but is not limited to, the following actions: (1) Plagiarism: The representation of previously written, published or creative work as one's own; (2) Unauthorized Collaboration on Projects; (3) Cheating on Examinations; (4) Unauthorized Advance Access to Exams; (5) Fraudulent Alteration of Academic Materials; (6)Knowing Cooperation with Another Person in an Academically Dishonest Undertaking. Students are required to actively protect their work against misuse by others.

Section Six

Oklahoma State Department of Education Teaching Certificate

Sandy Garrett

State Superintendent of Public Instruction

The State Board of Education certifies and authorizes Scott D. Makintubee to serve in the accredited schools of Oklahoma as indicated below.

Teacher #: **303446** Degree: **Bachelor's Degree** Class: **License - Resident Teacher Program Completed** Print Date: **11/4/2010**

Area Description	Level	Valid	Expire
5550 ADVANCED MATHEMATICS	6-12	1/1/2010	6/30/2015
5552 INTERMEDIATE MATHEMATICS	6-12	1/1/2010	6/30/2015
6015 PHYSICS	6-12	1/1/2010	6/30/2015

**********NO ENTRIES BELOW THIS LINE**********

Area Description	Level	Valid	Expire
5555 MATH FOR HIGH SCHOOL CREDIT	5-8	1/1/2010	6/30/2015
6006 CHEMISTRY	6-12	10/1/2010	6/30/2015

**********NO ENTRIES BELOW THIS LINE**********

SUSAN J. MATTOX

17070 S 433RD W AVE

BRISTOW OK 74010

CERTIFICATE ABOVE FOR PERSONAL RECORDS

SUBMIT CERTIFICATE BELOW TO SCHOOL DISTRICT

Oklahoma State Department of Education Teaching Certificate

The State Board of Education certifies and authorizes SUSAN J. MATTOX to serve in the accredited schools of Oklahoma as indicated below.

Teacher #: 179844 L

Degree: BACHELORS
MASTERS

Class: STANDARD

Print Date: 04/14/2003

Code	Description	Ed	Ty	Valid From M D Y	Valid To M D Y
5501	ALGEBRA	3	9	07 01 1980	06 30 2013
5503	CALCULUS	3	9	07 01 1980	06 30 2013
5509	GENERAL MATHEMATICS	3	9	07 01 1980	06 30 2013
5511	STATISTICS	3	9	07 01 1980	06 30 2013
5575	MATH MIDDLE SCHOOL	3	9	07 01 1980	06 30 2013
**********	NO ENTRIES				

Code	Description	Ed	Ty	Valid From M D Y	Valid To M D Y
5503	ANALYSIS	3	9	07 01 1980	06 30 2013
5507	COMPUTER SCIENCE/APP	3	9	07 01 1980	06 30 2013
5511	GEOMETRY	3	9	07 01 1980	06 30 2013
5517	TRIGONOMETRY	3	9	07 01 1980	06 30 2013
**********	BELOW THIS LINE				

Superintendent of Public Instruction

Oklahoma State Department *ıcation Teaching Certificate*

State Superintendent of Public Instruction

The State Board of Education certifies and authorizes NANCY J. OVERTON to serve in the accredited schools of Oklahoma as indicated below.

Teacher #:206048 Degree:Bachelor's Degree Class:Standard

Area Description	Level	Valid	Expire	Area Description	Level	Valid	Expire
6001 ANATOMY/PHYSIOLOGY	6-12	3/1/2010	6/30/2015	6003 BIOLOGY	6-12	3/1/2010	6/30/2015
6005 BOTANY	6-12	3/1/2010	6/30/2015	6006 CHEMISTRY	6-12	9/1/2011	6/30/2015
6007 COMPUTER APPLICATIONS	6-12	3/1/2010	6/30/2015	6009 EARTH SCIENCE	6-12	3/1/2010	6/30/2015
6011 GENERAL SCIENCE	6-12	3/1/2010	6/30/2015	6013 PHYSICAL SCIENCE	6-12	3/1/2010	6/30/2015
6075 SCIENCE	6-8	3/1/2010	6/30/2015	6017 ZOOLOGY	6-12	3/1/2010	6/30/2015

**********NO ENTRIES BELOW THIS LINE********** **********NO ENTRIES BELOW THIS LINE**********

Oklahoma State Department of Education Teaching Certificate

Sandy Garrett

State Superintendent of Public Instruction

The State Board of Education certifies and authorizes DENISE K. RADCLIFF to serve in the accredited schools of Oklahoma as indicated below.

Teacher #: **203235** Degree: **Bachelor's Degree** Class: **Standard** Print Date: **5/28/2009**

Area Description	Level	Valid	Expire	Area Description	Level	Valid	Expire
6001 ANATOMY/PHYSIOLOGY	7-12	5/1/2009	6/30/2014	6003 BIOLOGY	7-12	5/1/2009	6/30/2014
6005 BOTANY	7-12	5/1/2009	6/30/2014	6011 GENERAL SCIENCE	7-12	5/1/2009	6/30/2014
6013 PHYSICAL SCIENCE	7-12	5/1/2009	6/30/2014	6017 ZOOLOGY	7-12	5/1/2009	6/30/2014
**********NO ENTRIES BELOW THIS LINE**********				**********NO ENTRIES BELOW THIS LINE**********			

National Board for Professional Teaching Standards Science/Adolescence and Young Adulthood (Ages 14-18)

Expires 2014

DENISE K. RADCLIFF
994 N DOUGLAS DR
CLAREMORE, OK 74017

Ceritificate Above for Personal Records

Submit Certificate Below to School District

Cert#0636225

Oklahoma State Department of Education

Teaching Certificate

The State Board of Education certifies and authorizes

John T. Mullen

to serve in the accredited schools of Oklahoma as indicated below.

Description	Level	Valid From	Valid To
ADVANCED MATHEMATICS	6-12	9/1/2011	6/30/2014
INTERMEDIATE MATHEMATICS	6-12	9/1/2011	6/30/2014
MID-LEVEL MATH FOR HIGH SCHOOL CREDIT	5-8	9/1/2011	6/30/2014
PHYSICS	6-12	9/1/2011	6/30/2014

**********NO ENTRIES BELOW THIS LINE **********

Teacher #: 409729

Print Date: 9/28/2011

Degree: Doctoral

Class of Certification: Teaching Credential

Certification Background Clearance: 3/16/2011

Janet C. Barresi

State Superintendent of Public Instruction