



**KENOSHA UNIFIED SCHOOL DISTRICT NO. 1
CURRICULUM AND INSTRUCTIONAL SERVICES**

**COURSE SYLLABUS FOR BIOTECHNOLOGY-HONORS
(411821 & 411822)**

Number of Credits: 1 **Location:** Lake View Technology Academy

Prerequisites: Teacher Permission

Course Description

Besides being a survey of biotechnology the class also builds a strong foundation in biology. The class covers cells, genetics, microbes and animal physiology. In addition, ecology, classification and evolution are addressed. The biotech aspects include forensic and genetic labs and discussions of the technological applications and bioethical issues. As well as being a more rigorous curriculum, the honors students are also required to do supplementary projects including a science fair project. The class emphasizes the scientific method and a hands-on approach.

Course Standards

- Standard A: Science Connections
- Standard B: Nature of Science
- Standard C: Science Inquiry
- Standard F: Life and Environmental Science
- Standard G: Science Applications
- Standard H: Science in Social and Personal Perspectives

Explanations of standards and most essential benchmarks may be viewed at: www.kusd.edu

Lifelong Learning Standards

- Knowledgeable person
- Effective communicator
- Quality producer
- Complex thinker
- Self-directed learner
- Contributing citizen

Lifelong learning benchmarks may be viewed at: www.kusd.edu.

Course Outline

- I. Science Skills
 - Graphing
 - Lab Safety *Safety Contract
 - Microscope
 - Scientific Method
 - Measurement skills Metric system
- II. Introduction to Biology
 - Characteristics of Life

- Macromolecules & intro to organic chemistry
 - 7 themes (reproduction- sexual and asexual...)
- III. The Cell
- IV. Prokaryotic/Eukaryotic
- Plant and animal cell differences
 - Cell Structure and Function
 - Cellular Respiration
 - photosynthesis
 - chemistry of photosynthesis and metabolism
 - membranes and transport
 - Membrane proteins & functions
- IV. Cell growth and division
- Cell Cycle
 - Mitosis & meiosis
- V. DNA and RNA
- VI. Structure and Function
- Replication
 - Transcription
 - Translation
 - Transformation (genetic engineering)
 - Cloning
 - Fingerprinting
- VI. Heredity
- Mendelian Genetics
 - Biotechnology (Genetic engineering, cloning)
 - Bioethics
- VII. Evolution
- Natural Selection
 - Genetic variation
 - Behavior and response
 - Adaptation
 - Population changes (genetic)
 - Evidence
- VIII. Classification
- Kingdoms of life
 - Binomial nomenclature
 - phylogeny
 - Dichotomous keys (making & using)
- VIII. Ecology
- Food chains, food webs, and energy pyramids
 - ecosystems
 - Relationships between organisms (mutualism, parasitism)
 - Biodiversity
 - Behavior and response

- Water & Soil testing

VIII. Microbiology

- Viruses
- Bacteria
- Protists
- Fungus
- Biotechnology uses and applications
- Spread and control of diseases

X. Structure and Function of Plants

- Types of plants
- Photosynthesis
- Physiology of plants

XI. Structure and Function of Animals

- Differences in Invertebrates and Vertebrates
- Body systems with comparative anatomy

XII. Forensic Science

- DNA fingerprinting
- Chromatography
- Other forms of evidence

Board-Approved Instructional Materials

DeSalle, Rob and Michael R. Heithaus (2008). *Biology*. Holt, Reinhart, and Winston.

Supplemental Text:

Daugherty, Ellen (2007). *Biotechnology for the New Millennium*. EMC Paradigm. and accompanying laboratory manual.

Resources for Parents:

www.go.hrw.com

Methods of Assessment

Final exams should be cumulative in nature, emphasizing the most essential benchmarks for the course. Results of the final exam represent 20 percent of the final grade, but this single measure *may not* drop a student's grade by more than one letter grade. In courses that rely heavily on a major project, performance exhibition, etc., the project should be divided into stages or components and each of those should be graded separately, providing students with frequent and specific feedback.

Board-Approved Grading Scale

Excerpts taken from School Board Rule 6452

GRADING SCALE

A+=98-100 percent

A=93-97 percent

A-=90-92 percent

B+=86-89 percent

B=83-85 percent

B-=80-82 percent

C+=76-79 percent

C=73-75 percent

C-=70-72 percent

D+=66-69 percent

D=63-65 percent
D-=60-62 percent

F=0-59 percent

MAKE-UP WORK

Students submitting work up to ten school days late without prior approval may receive up to two grades lower on the work than they would have received if the work had been submitted on time (i.e., B+ lowered to a D+). Student work submitted after ten school days without prior approval shall not be accepted for credit and shall be recorded with a score of zero.

Upon returning to school after an absence, a student has the responsibility within the number of days equal to the length of the absence or suspension to meet with the teacher to develop a plan for making up missed work, quizzes, and examinations. A truant student has the responsibility on the first day he or she returns to the course/class to meet with the teacher to develop a plan for making up missed work, quizzes, and examinations. Lower grades may not be given for late work due to excused absences, suspension, or truancy unless the work is submitted later than agreed upon deadlines.

See Rule 6452 in its entirety at: www.kusd.edu.