BIOTECHNOLOGY COURSE DESCRIPTION

Semester 1 2014-15
Room 3050
Rademacher
westweb.madison.k12.wi.us/science/biotech

Objectives:
1) To provide experience in molecular biology lab techniques and experimentation.
2) To understand genetic engineering so that informed decisions can be made regarding social/ethical issues.

Here's How (tentative topic Outline):
1. Introduction
   • Social Issues and Bioethics
   • Making lab solutions
   • Appropriate lab practices
2. Aseptic technique and plant tissue culture
   • African Violet micropropagation
3. Classical Biotechnology: Food and fermentation: yogurt, root beer, biofuels
4. DNA structure and function
   • Modeling Activities
5. Techniques of recombinant DNA
   • DNA extraction
   • Gel electrophoresis
   • DNA quantitation
   • DNA Sequencing
   • PCR
   • Restriction Enzyme Analysis of DNA
   • Bacterial transformation
6. DNA Profiling
   • Transposons, VNTRs
   • DNA Barcoding
7. Genomics and bioinformatics
   • Microarray technology
   • RNAi

Required Materials:
• Folder for handouts (there is no textbook for this course)
• Lab Notebook (exclusively for lab work in biotech) – composition books work best
• some other notebook (or section) for lecture notes

A current article from Science, Nature, Scientific American, American Scientist, Discover - Please, NO downloads from the internet - please get the magazine (available in the LMC - other magazines or scientific journals with permission). Choose a current (within the last year or so) article that features a topic in biotechnology that interests you. Hand in one copy on your assigned date along with questions for your classmates to answer, a key, and the article report form.

GRADES
Points will be earned for Lab Notebook, Lab performance, tests, worksheets, and weekly reading of biotech articles. Your final exam format may be a written exam, research project, a video (see website for details). You must commit by the 8th week of your semester.

SCALE
90 -100 % A
80 - 90 % B
70 -80 % C
60- 70 % D

Policies:
• Late work will not be accepted. (extenuating circumstances will be considered on a case by case basis.) All assignments are due at the beginning of class.
• Attendance is extremely important because of the lab work. Please schedule appointments, college visits, family vacations and performances so as to not conflict with class.
• You are responsible for material missed during excused absences. If you are absent when an assignment is due, turning it in the day you return is your responsibility.
• Unexcused tardiness and absences are not expected.