

Introduction to Biotechnology BIOL

1414-4 credit hours

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Course Description: An introduction to biotechnology including career exploration, history and applications of DNA/RNA technology molecular biology, bioethics, and laboratory safe practices. The course is supplemented with laboratory exercises, demonstrations and field trips that illustrate the basic techniques of biotechnology including laboratory topics and finally the course concludes with a consideration of bioethical issues relating to this powerful new technology.

Supplies:

- Textbook: Biotechnology Science For the New Millennium, Ellyn Daugherty, 2007
 - I have a class set of textbooks. Students will have to purchase their own textbook if they would like to keep one at home, but it is not required.
- Lab Binder for this class ONLY-small is fine but I will be collecting them for grades so it may not contain ANY OTHER SUBJECTS!

- Internet Access outside of class
- 1 role of paper towels
- 1 ream of paper

COST/FEES:

- ACC Tuition: NONE-Paid for by the district
- Textbook: NONE –Class set PAID for by Mrs. Houser
- **LabFee (if you plan on taking this course for dual credit): \$24.00**

This will help pay for lab consumables/materials, project fees/materials and field trip expenses required to complete the course. This fee is not paid by AISD and should be paid directly by check to "Anderson Science Department".
- There is a scholarship fund for those who have come upon hard times which I know is epidemic these days. Please do not hesitate to call or email me if you would like to use these funds. Everyone needs help sometime. You can pay it back to someone else in need down the road

Grades:

- Test-50%
- Labs, homework, everything else-50%

Enrollment:

- Everyone will receive a 4th year Science Credit-Honors
- You may also enroll in this course for DUAL CREDIT (college and high school credit)
 - I will help you enroll in Early College Start in the Fall and BIOL 1414 in in the Spring

Class SetUp/Rational:

- This is a college workforce course that is career prep/student centered meaning you will do the information gathering, lab setups, lab execution and lab clean up.
- You will be able to create a resume with various lab skills upon completion of the course and be overqualified for a lab technician position.
- All test are open lab notebook and or project based which means they will not be easy, but you should do fine if you pay attention in class, record everything you observe or conclude and ask questions when you don't understand.
- If you take care of business during class, homework should be rare with the exception of studying for test.

CLASS RULES:

***Don't be upset by the results you get from the work you didn't do.**

***If it's important to you, you will make it happen. If not, you will make excuses.**

Consequences: Treat you like a high school freshman

		Power Point	Book	Activity	Lab	Capstone Project
Module 1	1.1 Biotech Basic	Biotech Basics		*Biotech Timeline *Current Events	Root Beer	Movie Maker
	1.2 Lab and Math Skills	*Math Skills *Lab Overview		*Math Skills *Excel Tutorial * Keeping a Lab Notebook *Writing an SOP	*Making Solutions and Dilutions *Training Lab Tech: Safety *Micropipette *Calibrating Lab Equipment	Stock Market
	1.3 Biology Review	The Cell		*Cells Alive *Virtual Electron Microscope	Microscope	
	1.4 DNA	DNA		*DNAi Timeline *DNA Replication *DNA origami	DNA Extraction	
	1.5 Proteins	Protein Synthesis Protein Structure and Function		*Copy the Code *Translating the code	DNA to Disease	Mapping the Human Genome

				*Trans/Trans Modeling		
Module 2	2.1 DNA Technology (Electrophoresis and recombinants)	DNA Technology		*DNA Sequencing *Making Recombinants	*Dye Electrophoresis *Restriction Enzymes *pGlo	Exploravisionn
	2.2 DNA Analysis (PCR, VNTR, RFLP)	DNA Analysis		PCR Web PFLP Web	*PCR *VNTR *PFLP	VNTR Case Study
	2.3 Therapeutic Proteins (column, SDS)			Module organisms	*SDS GFP *Column Chromatography	
	2.4 Bioinformatics	Bioinformatics		Bioinformatics: The Basics		Bioinformatics: Understanding Disease
Module 3	3.1 Cloning Methods	Cloning Methods		*History of Cloning *Cloning methods		Cloning in the Movies
	3.2 Advancements in Animal BT	Advancements in Animal BT		*RNAi *SNPs	*RNAi *SNPs	Transgenics

	3.3 Plant Biotechnology	Plant Biotechnology		Harvest of Fear	*Detection of GM Foods *Plant Tissue Culture	GMO Ethics
	3.4 Environmental Biotechnology	Environmental Biotechnology			Bioremediation	
Module 4	4.1 Regenerative Medicine			Career Webquest		
	4.2 Molecular Diagnostics			Microarrays	*ELISA *Microarrays	Resume Building
	4.3 Pharmaceuticals			Epigenetics		



