

INTRODUCTION TO AGRICULTURAL BIOTECHNOLOGY

PLSS 433, PSGA433, PLB433 & ANS-FN 433-4

Fall, 2010

Course Description:

This course will cover the basic principles of plant and animal biotechnology using current examples; gene mapping in breeding, transgenic approaches to improve crop plants and transgenic approaches to improve animals will be considered. Technology transfer from laboratory to marketplace will be considered. An understanding of gene mapping, cloning, transfer, and expression will be derived.

Objectives:

1. To gain an understanding of the techniques and terminology of Biotechnology.
2. To understand the applicability of Agricultural Biotechnology.
3. To understand the gains attainable through Agricultural Biotechnology.
4. To appreciate the nature of environmental and ethical concerns over Biotechnology.

Instructors:

David A. Lightfoot, Ph.D.
Soy Ctr./Public Policy Inst. 113
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453-1797

Office Hrs:

MWF 9-11, 1-3
or by appointment

Guest Lecturers (not in Summer)

Karen Jones, Ph.D.,
Ag 129
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453-1774

Office Hrs:

M 8-noon W3-5
or by appointment

TA: Ali Srour BMB PhD, asrour@siu.edu PPI Room B1-11 Office Hrs: W 10-4.

Lecture: Mondays, 10-11.50 PM, PPI114a or, if needed Friday 10 am

Lab: Thursdays, 12-2.50 PM, PPI B5 (or 15 page paper/proposal development)

Textbooks (in bookstore under PLSS):

Required –

Either Biology and Biotechnology: Science, Applications, and Issues, Kreuzer and Massey, ISBN 978-1-55581-304-8 \$80

Or Molecular Biotechnology: Principles & Applications of Recombinant DNA, Glick & Pasternak^{4th} edition 978-1-55581-498-4, \$120

Optional

A Cartoon Guide to Genetics, Gonick--Optional. \$20

Molecular Biotechnology, Primrose--Reference (Previous Text) ISN0-632-03053-4 OOP

Genetically Modified Crops ed NG Halford ISBN: 978-1-86094-353-9 1-86094-353-5

Grading:

Quizzes: Ten point revision quizzes will be given as take home tests each Monday lecture covering material from the lectures and labs from the previous week since the last quiz. The lowest two quizzes scores will be dropped.

Exams: Two take-home exams will be given during the semester. One midterms and one due during finals week. The 10% will be taken off the top of exams for each day that they are late. Take-home exams should be typed unless permission is given by the instructor. Do not plagiarize from text, reference materials, or webpages.

Lab Reports: A number of lab reports (3-4) will be turned in during the semester. Like take-home exams, 10% will be taken off the top of exams each day that they are late. Legibility is important. Alternately 1 10-15 page grant proposal is due.

Other Assignments: A few other assignments in the course are probable.

Incompletes: Incompletes will only be given in special cases with written endorsement from a medical professional or university official. Failing the course is not a reason for receiving an incomplete on its own.

Grading Breakdown:	A=91-100%	Exams	45%
	B=81-90%	Lab Reports	45%
	C=71-80%	Quizzes, Misc.	10%
	D=61-70%		100%
	F=≤60%		

PSGA/PLB/ANS/PLSS 433 Lecture & Lab Schedule Spring

Date	Lecture Topic	Lecturer
Jan 15	Welcome Introduction and Review	Lightfoot
Jan 22	<i>Lab: Lab Safety, Lab Books, & Pipette Calibration</i>	Lightfoot
Jan 26	Recombinant DNA Techniques: Cloning, PCR, etc.	Lightfoot
Feb 29	<i>Lab: Herbicide/Antibiotic Resistant Organisms</i>	Lightfoot
Feb 2	Recombinant DNA Techniques: Gene Probes	Lightfoot
Feb 5	<i>Lab: DNA Electrophoresis. Exam Given Out</i>	Lightfoot
Feb 9	Plant Cell Culture & Propagation	Lightfoot
Feb 12	<i>Lab: Transformation of Microbes</i>	Lightfoot
Feb 23	Recombinant DNA Techniques: Molecular Markers	Lightfoot
Feb 26	<i>Lab: Plant Cell Culture</i>	Lightfoot
Mar 2	Microbiology Applications	Lightfoot
Mar 5	<i>Lab: Microbial Fermentation</i>	Lightfoot
Spring Break		
Mar 14	Plant Cell Culture & Propagation	Lightfoot
Mar 19	<i>Midterm Due & Lab: Plant Transformation</i>	
	Lightfoot	
Mar 23	Transgenic Plants	Lightfoot
Mar 26	<i>Lab: DNA Analysis</i>	Lightfoot
Mar 30	Molecular Breeding: Plants & Animals	Lightfoot
Apr 2	<i>Lab: Molecular Markers for Breeding</i>	Lightfoot
Apr 4	Molecular Breeding: Plants & Animals <i>Exam Given</i>	Lightfoot
Apr 9	<i>Lab: More Molecular Markers for Breeding</i>	Lightfoot
Apr 11	Antibodies Mammalian Cell Culture & Applications	Jones
Apr 16	<i>Mammalian Cell Culture</i>	Jones
Apr 18	Antibodies & Applications	Lightfoot
Apr 23	<i>Lab: Progesterone RIA</i>	Lightfoot
Apr 25	Environmental, Social, and Ethical Issues	Lightfoot
Apr 30	<i>Lab: Biotechnology Acceptance</i>	Lightfoot/Wang
May 4-8	FINAL EXAM due	

Friday lecture will be ad hoc, used to make up missed Monday classes or attend the seminars of MBMB (LS3 157, 11a), Physiol (LS3 157, 12a), Chem seminar (Neckers 101, 4 pm) or PLB seminar (LS2, 417, 3 pm) when Biotechnology topics are presented.

Summer schedule: Either self directed or 2 lectures a week (MW). Problems replace Labs.

Emergency Procedures. Southern Illinois University Carbondale is committed to providing a safe and healthy environment for study and work. Because some health and safety circumstances are beyond our control, we ask that you become familiar with the SIUC Emergency Response Plan and Building Emergency Response Team (BERT) program. Emergency response information is available on posters in buildings on campus, available on BERT's website at www.bert.siu.edu, Department of Safety's website www.dps.siu.edu (disaster drop down) and in Emergency Response Guideline pamphlet. Know how to respond to each type of emergency.

Instructors will provide guidance and direction to students in the classroom in the event of an emergency affecting your location. It is important that you follow these instructions and stay with your instructor during an evacuation or sheltering emergency. The Building Emergency Response Team will provide assistance to your instructor in evacuating the building or sheltering within the facility.