

Agricultural Biotechnology AG494

Course Syllabus

June 21 – July 2, 2010

Instructors:

Dr. Mike Shintaku

Dr. Ania Wieczorek

Dr. Susan C. Miyasaka

Mr. Mario Patino

Credits: 3

Tuition: waived

There will be a limit of 12 participants; preference will be given to those who are actively teaching middle or high school classes. To be accepted into the class, teachers must fill out an application form along with names and contact information of two professional references. Those teachers from off-island or from West Hawaii may apply for a travel stipend that includes air fare and shared rental car (or mileage where applicable), lodging, and meals and incidentals. If the applicant doesn't complete the course, then he or she must reimburse the University of Hawaii for his or her stipend. Teachers who need a place to stay in Hilo are expected to share a dormitory room; they could request a particular roommate. Participants must sign a liability release form. Those DOE teachers seeking to use this course for professional advancement (increase in pay scale) are responsible for obtaining approval from their principal and filling out necessary paperwork.

1. Objectives of the course

- a. To model instructional methods of agricultural biotechnology for later use in the classroom. Course will meet DOE content standards for science and agriculture.
- b. To present the pros and cons of agricultural biotechnology for a sustainable future and a context for learning. At the end of the course, teachers should be able to present science-based information on the benefits and risks of agricultural biotechnology to their students.

2. Timetable (Lecture, Discussion, Exercises 9 a.m. – 12 p.m.; Laboratory 1 p.m. – 3 p.m.)

Day	Time	Syllabus	Instructor	Notes
M 6/21	9 a.m.	Introduction to DNA, RNA, proteins Instructional alignment to State Standards Introduction to chromosomal inheritance, genes, traits	Patino	Liability release Discussion of course evaluation
6/21	11 a.m.	Introduction to laboratory safety Demonstration of pipetting & other laboratory procedures	Shintaku	Proper maintenance of lab notebook
6/21	1 p.m.	Visit papaya packing plant, Hawaii Tropical Products	Loren Mochida	
Tu 6/22	9 a.m.	Genetic Engineering of papaya for Papaya Ringspot resistance	Gonsalves (tentative)	

6/22	1 p.m.	Transformation Module: <ul style="list-style-type: none"> ▪ competent cell making ▪ pGLO transformation 	Shintaku	
Wed 6/23	9 a.m.	Tools of Agricultural biotechnology, ancient and modern Video: "Harvest of Fear"	Patino	
6/23	1 p.m.	Transformation Module cont'd. <ul style="list-style-type: none"> ▪ Electroporation ▪ Pick colonies ▪ Calculation of competency 	Shintaku	
Thurs. 6/24	10 a.m.	Introduction to PCR and primers Introduction to ELISA Instructional alignment to State Standards	Patino	
6/24	1 p.m.	Transformation Module cont'd. <ul style="list-style-type: none"> ▪ Mini-prep purification of plasmids ▪ Genomic DNA extraction ▪ Restriction digest and gel analysis 	Shintaku	
Fri. 6/25	9 a.m.	Visit to Kamehameha School, Keaau campus Instructional alignment to State Standards	Patino	Laboratory Notes Due
6/25	12:00 p.m.	Field trip to Papaya fields; talk-story with farmers	Delan Perry (tentative)	
Mon. 6/28	9 a.m.	Letting the Gene-ie out of the Bottle; Wishes come true or escaped monster. Genetically Engineered Food and the Science behind it. Part 1	Wieczorek	Discussion
6/28	1 p.m.	Introduction to 'Gene-ius Day'- Biotechnology education program for K-12. Papaya Module: <ul style="list-style-type: none"> ▪ DNA extraction ▪ Primers 	Wieczorek	Discussion
Tues. 6/29	9 a.m.	Letting the Gene-ie out of the Bottle; Wishes come true or escaped monster. Genetically Engineered Food and the Science behind it. Part 2	Wieczorek	Discussion
6/28	1 p.m.	Papaya Module (cont'd): <ul style="list-style-type: none"> ▪ PCR ▪ ELISA 	Wieczorek	

Wed. 6/30	9 a.m.	Co-existence Labeling of GE foods	Wieczorek	Discussion
6/30	1 p.m.	Papaya Module (cont'd): <ul style="list-style-type: none"> ▪ Staining of papaya seeds with xGluc ▪ QuickStix for GE corn 	Wieczorek	
Th. 7/1	9 a.m.	Politics and Biotechnology Video: "Islands at Risk"	Miyasaka	Discussion Laboratory Notes Due
7/1	1:00 p.m.	Field trip to Pacific Basin Agriculture Center (PBARC)	Tracie Matsumoto	
Fri. 7/2	9 a.m. – 12 noon	Oral Presentations		Course evaluation
7/2	1:00 p.m.	Oral Presentations (cont'd)		

2. Grade allocations

Lab notes (30%): You will be graded on the quality of your lab notes and performance in the class. Lab notes are submitted twice for grading. You will receive feedback after your first submission of lab notes for improvement. Grading will be based on rubrics to be distributed on the first day of class.

Quizzes (30%): Three quizzes will test students for understanding of laboratory methods and concepts of agricultural biotechnology (10% each).

Oral presentation (30%): At the end of the course, you will give a 15-20min oral presentation on how you have or plan to incorporate molecular genetic methods into your classroom. Turn in a lesson plan. Grading will be based on rubrics to be distributed on the first day of class.

Discussion (10%): Participation in a discussion of pros and cons of Agricultural Biotechnology.

Students with disabilities. Any student with a documented disability who would like to request accommodations should contact the University Disability Services Office - Hale Kauanoë A Wing Lounge, 933-0816 (V), 933-3334 (TTY), shirachi@hawaii.edu - as early in the semester as possible.

3. Contacts

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