



SACRAMENTO
STATE

Course Change Proposal Form A



Academic Group (College): Natural Sciences and Mathematics	Academic Organization (Department): Biological Sciences	Date: January 19, 2007
Type of Course Proposal: New <input checked="" type="checkbox"/> Change <input type="checkbox"/> Deletion <input type="checkbox"/>	Department Chair: Nicholas Ewing	Submitted by: Shannon Datwyler
Does this course fulfill a requirement for single-subject or multiple subject credential students? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	For Catalog Copy: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> CCE: Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Semester Effective: Fall <input checked="" type="checkbox"/> Spring <input type="checkbox"/> , 2007

This course replaces experimental course Subject Area (prefix) and Catalog Number (course number):	
This Catalog Number (course number) is being replaced:	

Change from:

Subject Area (prefix) & Catalog No. (course no.):	Title:	Units:
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Change to:

Subject Area (prefix) & Catalog No. (course no.): BIO 113	Title: Evolution and Speciation in Flowering Plants	Units: 3
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JUSTIFICATION:

Adding a course on evolution and speciation in angiosperms (flowering plants) that does not have an associated lab will complement existing laboratory courses, such as Plant Taxonomy and Natural History of Plants, as well as lecture only courses (Land Plant Evolution and Plants and Civilization) in plant biology, while also providing one more course that students may use to fulfill the requirement that all Bio Sci majors complete an upper division course in plant biology.

NEW COURSE DESCRIPTION: (Not to exceed 80 words, and language should conform to catalog copy. See <http://www.csus.edu/acaf/univmanual/crspsl.htm> - Guidelines for Catalog Course Description)

A survey of the important tools and mechanisms used to study speciation in plants. Topics include the molecular basis of evolutionary change, intraspecific genetic variation at both the local and landscape levels, theory regarding mechanisms of speciation, and the importance of polyploidy. Readings will be from both a text and from the primary literature, and will include in-depth discussions of historical and modern studies in plant evolution.

Note: Lecture 3 hours

Prerequisite: BIO 001 and BIO 002 or equivalent

Corequisite:

CAN (California Articulation Number):

Graded: Letter X Credit/No Credit

Instructor Approval Required? Yes No

Course Classification (e.g., lecture, lab, seminar, discussion):
Lecture/Discussion (C2)

Title for SIS+/CMS (not more than 30 characters)
Evol and Speciation in Plants

Cross Listed?
Yes No

If yes, do they meet together and fulfill the same requirement, and what is the other course.

How Many Times Can This Course be Taken for Credit? one

Can the course be taken for Credit more than once during the same term? Yes No

FOR NEW COURSE PROPOSALS OR SUBSTANTIVE CHANGES ONLY:

Description of the Expected Learning Outcomes: Describe outcomes using the following format: "Students will be able to: 1), 2), etc." See the example at <http://www.csus.edu/acaf/example.htm>

Students will be able to:

1. Understand the inheritance and variation in genetic material of plants
2. Be familiar with techniques used to study plant evolution.
3. Understand the genetic basis of phenotypes, and phenotypic plasticity
4. Understand the mechanisms that prevent inbreeding
5. Be familiar with the extraordinary variation in plant breeding systems, and their evolution
6. Understand the ecological factors that influence plant evolution
7. Be familiar with the species concepts commonly used by biologists
8. Understand the mechanisms responsible for speciation in plants
9. Know how to determine the important factors influencing speciation
10. Understand the importance of hybridization in evolution
11. Comprehend the tremendous role that polyploidy plays in plant evolution
12. Understand the genetic and morphological changes evident in polyploids
13. Be able to effectively lead a discussion on topics related to plant speciation
14. Be able to discuss scientific papers and theories related to speciation in plants

****Attach a list of the required/recommended course readings and activities [Note: it is understood that these are updated and modified as needed by the instructor(s).] This attachment should be forwarded only to your Dean's office, not Academic Affairs.**

Assessment Strategies: A description of the assessment strategies (e.g., portfolios, examinations, performances, pre-and post-tests, conferences with students, student papers) which will be used by the instructor to determine the extent to which students have achieved the learning outcomes noted above:

Three take-home exams, two presentations, participation in discussions, and a comprehensive final exam

For whom is this course being developed?

Majors in the Dept Majors of other Depts Minors in the Dept General Education Other

Is this course required in a degree program (major, minor, graduate degree, certificate)? Yes No

If yes, identify program(s):

Does the proposed change or addition cause a significant increase in the use of College or University resources (lab room, computer facilities, faculty, etc.)? Yes No

If yes, attach a description of resources needed and verify that resources are available.


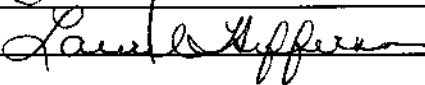
Indicate which department or programs will be affected by the proposed course (if any). _____

The Department Chair's signature below indicates that affected programs have been sent a copy of this proposal form.

Approvals: If proposed change, new course or deletion is approved, sign and date below. If not approved, forward without signing to the next reviewing authority, and attach an explanatory memorandum to the original copy.

Signatures:

Date

Department Chair:		4/19/07
College Dean or Associate Dean:		4/19/07
CPSP (for school personnel courses ONLY)		
Associate Vice President and Dean for Academic Programs	CONDITIONAL APPROVAL 4/20/07	

Distribution: Academic Affairs (original), Department Chair and College Dean. Dean's office to send original after approval to Academic Affairs, at mail zip 6016. An electronic copy must also be sent.

Resource Justification
Bio 113, Evolution and Speciation in Flowering Plants

This new course is a lecture only course and so avoids the need for increased OE support. However, this course will require 3 WTU each time that it is offered. Initially, we plan to offer it in rotation with Bio 111 such that there will be no net change in the number of WTU's in the Department's schedule. Should the Department's enrollments continue to grow we may offer the course with increasing frequency. We anticipate capping enrollments at 90 and anticipate enrollments to easily reach 30 to 50 students, therefore, this course has the potential to add significant FTES to the College at relatively low cost.

BIO 113: EVOLUTION AND SPECIATION IN FLOWERING PLANTS
Fall 2007

Welcome to Evolution and Speciation in Flowering Plants! In this course, we will be discussing some of the major concepts related to evolutionary biology in plants, focusing on factors leading to speciation. The format of this course will include both lecture and group discussions. By the end of the course you should:

- Understand the inheritance and variation in genetic material of plants
- Be familiar with techniques used to study plant evolution.
- Understand the genetic basis of phenotypes, and phenotypic plasticity
- Understand the mechanisms that prevent inbreeding
- Be familiar with the extraordinary variation in plant breeding systems, and their evolution
- Understand the ecological factors that influence plant evolution
- Be familiar with the species concepts commonly used by biologists
- Understand the mechanisms responsible for speciation in plants
- Know how to determine the important factors influencing speciation
- Understand the importance of hybridization in evolution
- Comprehend the tremendous role that polyploidy plays in plant evolution
- Understand the genetic and morphological changes evident in polyploids
- Be able to effectively lead a discussion on topics related to plant speciation
- Be able to discuss scientific papers and theories related to speciation in plants

INSTRUCTOR:

Dr. Shannon L. Datwyler

Email: datwyler@csus.edu

Website: <http://www.csus.edu/indiv/D/datwylers/index.htm>

Office: SQU 406; Phone: 278-7276

Office Hours: XXXX. I'm also available by appointment. Please email me if you would like to set up an appointment.

CLASS MEETINGS:

Lecture: XXX
XXXXX

TEXT:

Briggs & Walters. 1997. Plant Variation & Evolution, 3rd edition. Cambridge University Press: New York, NY
ISBN: 0 52145918 4

Supplementary papers will be used for case studies. I will make these available either electronically or give you copies

GRADING:

Grading in this course will be based on exams, presentations, and active participation in discussions. The point distribution is as follows:

	<u>Total Points</u>
3 Take-home exams @ 100 pts each	300
2 Presentations @ 25 pts each	50
Participation/Attendance	50
Comprehensive Final Exam	100
Point Total	500

Grade assignments will be on a standard 90-80-70... scale.

COURSE ASSIGNMENTS:

Your grade in this course will be based on exam performance, participation and attendance, and two presentations. While three of the exams will be in take-home format, realize that the expectation from a take-home exam is very different than an in-class exam. Each take home exam will be approximately six pages, typed (double spaced, 12 pt Times New Roman font, 1" margins). You will have two to three questions to address. I expect that your response will integrate both reading assignments, lecture material, and ideas brought out during class discussions. You will also be responsible for co-leading two small group discussions during the semester (case studies). I will provide you with detailed guidelines on these soon. Furthermore, you will be expected to attend lectures and discussions, so that you will benefit from the insights that arise from classroom interactions. Thus each of you can earn up to 50 discretionary points that I will assign based on attendance and participation. This is enough to change your grade by one full letter grade during the semester.

HOW TO SUCCEED IN THIS COURSE:

- *Attend lectures and take notes.* **Attendance is mandatory** (that's what you're here for, after all). Even though I may not take attendance every day, it is important that you are in class. If I notice that you are absent frequently, or come to class unprepared, I will begin to make notes and deduct points from your participation grade. Furthermore, come to class prepared. I expect that you will have read the relevant material prior to coming to each lecture. Our class meeting time may cover the basic ideas in the text, but I will also talk about subjects not included in the text. You will be responsible for *all* of the material for the exams.
- *Spend enough time studying.* We are covering a lot of material in this course. It is important to review lecture material regularly in order to succeed on exams. In order to receive an A or B in this course, ***expect to spend about two hours studying for every hour you spend in class*** (6 hours reading and reviewing lecture notes...). It is very easy to fall behind. If you stay on top of readings and assignments, you are likely to do much better on exams.
- *Ask questions.* My job is to present information to you, encourage your exploration of the subject, and help you master it. Please let me know if you don't understand something. Don't be shy about asking questions during lecture because if you don't understand something, chances are there are other students that don't understand. Also, please take advantage of my office hours to come by and ask questions.

MISCELLANEOUS NOTES:

Cheating: I urge everyone to review the University policy on academic dishonesty (<http://www.csus.edu/schedule/fall2006spring2007/acadishnsty.stm>). In addition to the actions listed in this document, receiving phone calls or pages during an exam, having papers other than exam forms on your desk, and talking to another student will be considered cheating. Any student caught cheating on an exam will receive a score of zero on that assignment. Any student suspected of cheating will be reported to the Dean of Students. Keep in mind that cheating can result in complete dismissal from CSUS.

Classroom etiquette: During class, please be respectful of me and of your fellow students. In particular, I have a few expectations of everyone during class meetings:

- Please don't talk while I'm talking. This is distracting not only to me, but to other students.
- Try to arrive on time. I know that sometimes arriving late (or leaving early) is unavoidable, but please do your best to be quiet if this happens.
- Please turn the sound off on cell phones and pagers during class. If you need to take a call, please leave the room before answering the phone. Answering phones during class is distracting to me and other students. During exams, I expect phones and pagers to be turned off.
- Eating and drinking are fine, as long as you are not disruptive to other students in the class.

TENTATIVE SCHEDULE

Below is a tentative class schedule. I may change the schedule to allow more time for some topics, less for others. Please be flexible and aware of any changes that are made during the course of the semester.

Week	Date	Lecture/Discussion Topic	Reading
1	Sept. 4	Introduction: types of variation in plants	Briggs & Walters Ch. 1
	Sept. 6	Historical Perspective on Evolution	Briggs & Walters Ch. 2
2	Sept. 11	Review of Genetics: Chloroplast, Mitochondrial and Nuclear genomes	Briggs & Walters Ch. 6
	Sept. 13	Mutation: Nucleotide, gene rearrangement, and chromosome evolution	Briggs & Walters Ch. 6
3	Sept. 18	Molecular Techniques: Types of Molecular Markers	Briggs & Walters Ch. 6
	Sept. 20	Translating genetic change to phenotype: Developmental Variation	Briggs & Walters Ch. 4
4	Sept. 25	Quantifying phenotypes in a population	Briggs & Walters Ch. 3
	Sept. 27	Case Study: Using DNA to study phenotypes	Supplemental Papers
		<i>Take-home Exam 1 Assigned</i>	
5	Oct. 2	Introduction to Reproductive Isolating Barriers	Briggs & Walters Ch. 4, 7
	Oct. 4	Plant Breeding Systems: an introduction	Briggs & Walters Ch. 7
6	Oct. 9	Mechanical and Behavioral Reproductive Isolating Barriers	Briggs & Walters Ch. 7
	Oct. 11	Case study: Evolution of pollination syndromes	Supplemental Papers
7	Oct. 16	Ecological Barriers: Ecotypic Variation	Briggs & Walters Ch. 4
	Oct. 18	Interaction of Genotype and Phenotype	Briggs & Walters Ch. 4, 8
8	Oct. 23	Case study: Clausen, Keck and Heisey Sierran Transect	Supplemental Papers
	Oct. 25	Microevolutionary change in populations	Briggs & Walters Ch. 9
		<i>Take-home Exam 2 Assigned</i>	
9	Oct. 30	Biological, Morphological and Phylogenetic Species Concepts	Briggs & Walters Ch. 10 & 13
	Nov. 1	Mechanisms of Speciation	Briggs & Walters Ch. 11
10	Nov. 6	Allopatric Speciation: Theory and examples	Briggs & Walters Ch. 11
	Nov. 8	Peripatric and parapatric speciation	Briggs & Walters Ch. 11
11	Nov. 13	Sympatric speciation	Briggs & Walters Ch. 11
	Nov. 15	Case Study: Examining modes of speciation	Supplemental Papers
12	Nov. 21	Polyploid speciation: genetics and morphology	Briggs & Walters Ch. 12
	Nov. 23	No Class—Thanksgiving	
13	Nov. 27	Allopolyploidy vs. Autopolyploidy	Briggs & Walters Ch. 12
		<i>Take-home Exam 3 Assigned</i>	
	Nov. 29	Case Study: Evolution of polyploid species complexes	Supplemental Papers
14	Dec. 4	Incomplete Reproductive Isolating Barriers: hybridization	Briggs & Walters Ch. 11
	Dec. 6	Hybridization in plants	Briggs & Walters Ch. 11
15	Dec. 11	Introgression	Briggs & Walters Ch. 11
	Dec. 13	Case Study: Hybrid speciation	Supplemental Papers
	TBA	IN-CLASS FINAL EXAM	