

**AGRI 490: AGRICULTURAL EXPERIMENTATION**  
CSU, Chico – College of Agriculture  
Spring 2012 – Course Syllabus

**Instructor:** Dr. Patrick Doyle  
**Class Schedule:** Lecture – Tues and Thurs, 12:30-1:45  
**Lab Schedule:** Sec 2 Thurs 2-5; Sec 3 Friday 11-2  
**Class Location:** LANG 302 (Lecture); PLMS 303 (Lab)  
**Office Hours:** T,R 11-12; W 10-1  
**Office Location:** PLMS 204  
**Phone:** Office - 530/898-6586  
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### Course Content and Objectives

This course is designed to provide an introduction to critical thinking and statistical methods for conducting applied agricultural research. Emphasis throughout will be on the principles of design and inference, rather than the mechanics of statistical computations.

The objectives for this course include:

- 1) Develop critical thinking, problem solving and analytical skills,
- 2) Develop literature review skills, including conducting an exhaustive review of the scientific literature for a topic of your own choosing,
- 3) Apply previously reported scientific knowledge in the development of a hypothesis and experiment to test the hypothesis, and
- 4) Effectively communicate your findings to an audience of your peers, faculty and/or staff.

Prerequisite:  
AGRI 331 (Agricultural Ecology)

### Textbooks

Required text –

**Experimental Design for the Life Sciences** by Graeme D. Ruxton and Nick Colgrave.

Required electronic text-

**How to Conduct Research on Your Farm or Ranch** by Western Region SARE  
Access: [www.sare.org/publications/research/research.pdf](http://www.sare.org/publications/research/research.pdf) (available via Vista WebCT)

**On Being a Scientist: Responsible Conduct in Research** by COMMITTEE ON SCIENCE, ENGINEERING, AND PUBLIC POLICY; NATIONAL ACADEMY OF SCIENCES; NATIONAL ACADEMY OF ENGINEERING; INSTITUTE OF MEDICINE  
Access: [www.nap.edu/openbook.php?record\\_id=4917&page=1](http://www.nap.edu/openbook.php?record_id=4917&page=1) (available via Vista WebCT)

Helpful Resources –

**Introduction to Agricultural Statistics** by Bob Davis (check half.com)

**Statistical Experiment Design and Interpretation: An Introduction with Agricultural Examples** by Claire Collins and Frances Seeney

**Experimental Design and Analysis in Animal Sciences** by T.R. Morris  
(order directly from Oxford Press (800) 451-7556 or [www.oup-usa.org](http://www.oup-usa.org))

## Lecture Schedule

The following is a **tentative** schedule and may be subject to change.

Date	Subject Matter	Lab Topic
T, 1/23	"Be Successful" – Introductions	WK 1: No Lab
R, 1/25	Getting Started – Scientific Method	
T, 1/31	Steps in Conducting Research	WK 2: Literature Review Skills; Parts of a Sci Journal Article
R, 2/2	Steps in Conducting Research	
T, 2/7	Review of Basic Concepts	WK 3: Sampling; Data Management
R, 2/9	Estimation/Sampling	
T, 2/14	Hypothesis Testing	WK 4: Asking the Right Questions – Tootsie Pop (Abstract)
R, 2/16	Hypothesis Testing	
T, 2/21	Principles of Design	WK 5: Power Analysis
R, 2/23	Principles of Design	
T, 2/28	Review Power Analysis ( <b>Lit Review Outline Due</b> )	WK 6: Agriscience Fair Papers (Judge – Pizza provided; Bring soda)
R, 3/1	Single Factor Designs – CRD	
T, 3/6	ANOVA	WK 7: T-Tests, ANOVA - Graphs, Tables
R, 3/8	Single Factor Designs – Local Control	
T, 3/13	Single Factor Designs – Local Control	WK 8: CRD-RBD-LSD Activity
R, 3/15	Single Factor Design Review ( <b>Part I Due</b> )	
T, 3/19	SPRING BREAK	
T, 3/27	Factorial Designs - CRD/Interaction	WK 10: Online Exercise – Data Interpretation
R, 3/29	Factorial Designs – Interaction/RBD	
T, 4/3	Factorial Designs – Split-Plot	WK 11: Soil Experiment (Abstract)
R, 4/5	Factorial Designs – Split-Plot	
T, 4/10	Design Implementation	WK 12: Count Data
R, 4/12	Design Implementation	
T, 4/17	Survey Research ( <b>Part II Due</b> )	WK 13: No Lab – Work on Research Projects
R, 4/19	No Class	
T, 4/24	Count Data	WK 14: Germination Trial (Abstract)
R, 4/26	Regression	
T, 5/1	Regression	WK 15: Regression
R, 5/3	Ethics in Research ( <b>PARDON DAY</b> )	
T, 5/8	Ethics in Research/Review ( <b>Part III Due</b> )	WK 16: Review Session
R, 5/10	No class – STUDY!	
T, 5/15	FINAL: 2 - 3:50 pm	

## Course Requirements and Student Responsibilities: Attendance, Assignments and Class Requirements

- You are expected to attend each class and to actively participate in discussions and planned activities. **Show up on time. More than 5 minutes late – don't come. If you have to study for another class, during lecture, don't come.**
- A missed exam will result in 0 points unless prior arrangements have been made with the instructor, or there is evidence of a serious and compelling reason (see *University Catalog*).
- If a student misses a class and/or lab, it is the student's responsibility to obtain the missed material from fellow classmates.
- **Assignments are due at the start of class. NO EXCEPTIONS. No late assignments will be accepted. Assignments left under office door will not be accepted. If you cannot locate me, leave assignment in mailbox in PLMS 317 with time stamp.**
- **General rule of thumb:  
Before the fact = good planning on your part. After the fact = it's just an excuse.**
- **All assignments are to be type-written. Handwritten assignments will not be accepted unless explicitly stated such as assignments requiring hand calculations.**
- If you have a disability that requires special accommodations, you must contact a counselor at Disability Support Services, Student Services Center Rm 170 (530) 898-5959.
- Students are responsible for handling the necessary paperwork for adding or dropping this class. University guidelines for dropping classes are strictly adhered to. As per your student catalog, students may add or drop courses without penalty during the first two weeks of school. During the third and fourth weeks of classes, COP forms to add or drop the course require an instructor signature. After this date, all COP forms to add or drop require a serious and compelling reason (see catalog) and require approval signatures of instructor, department chair and dean of college. If you drop before the end of the fourth week, the course will not appear on your academic record. However, a grade of "W" (for "Withdrawal") will appear on your academic record if dropped after the fourth week.

## Grading for this Class

Lab Assignments/Problems	200
Take Home Assignments (4 of 6 will be graded)	80
Sci. Review paper/outline	50
Sci. Method/Experimental Design Project	
Project Participation	25
Mentoring	25
Paper – Part I (Introduction, Materials & Methods, Lit Cited)	50
Part II (Results and Discussion, Lit Cited)	50
Part III (Parts I and II Revised + Abstract, Lit Cited)	50
Research Presentation (Review Scientific Journal Article)	25
Quizzes	100
Comprehensive Final Exam	150
<b>Total</b>	<b>805*</b>

\*Actual number of total points may vary depending upon actual number of problems/quizzes/etc. given.

### Grading Scale:

A ≥ 93%	B ≥ 83%	C ≥ 73%	D ≥ 60%
A- ≥ 90%	B- ≥ 80%	C- ≥ 70%	F < 60%
B+ ≥ 87%	C+ ≥ 77%	D+ ≥ 67%	

If there is evidence that you have been involved in any form of academic dishonesty, you will receive an “F” grade for the course, be locked from Vista WebCT, and a report will be provided to Student Judicial Affairs for further action.

If a student feels an error in grading has been made, the student has one week from the time of the assignment is returned to them (or the grade is posted on the web, whichever is later) to request a review of the grade. The request must be in writing – attached to the original assignment—and must include a specific statement as to what is in error, how it should be corrected, and what supporting evidence is available.

### Doyle’s Pardon Day

At the start of lab on the designated day (check syllabus schedule), you may turn in missed assignments for **UP TO HALF** of the original total points for the assignment. The assignment must be type-written and represent your original work.

### Literature Review Outline and Design Projects

The AGRI 490 is designed for students to develop and design an original agricultural research project. In the process, each student will review and analyze original, published research on your research topic. Each student is required to:

- 1) state a clear research question or problem,
- 2) research the problem (literature review),
- 3) state a clear hypothesis (objective),
- 4) design an experiment to test the hypothesis,
- 5) analyze the data, and
- 6) write a scientific report to share your results and conclusions.

Each of you is assuming the role of a scientist. You are seeking truth and sharing your results with the rest of the scientific and agricultural communities.

### Expected Student Behavior in the Classroom

- Students are expected to turn off all pagers, cell phones and other electronic devices during class time. **Interruptions will negatively impact your final grade!!! Two percentage points will be deducted from your final grade for every violation.**
- Students are expected to pay attention and participate in class meetings.
- Students may not read other materials (newspapers, magazines) during class.
- Students are to remain in class during the entire session with the exception of breaks. Students are not allowed to come and go during the class session.

- All class participants are expected to exhibit respectful behavior to other students and the instructor.
- All students have the right and privilege to learn in the class, free from harassment and disruption.
- Inappropriate or disruptive behavior will not be tolerated, nor will lewd or foul language.
- The class follows the standards set in the *Code of Students Rights and Responsibilities (EM 96-38)* and students are subject to disciplinary action for violation of that code.

## Academic Rigor (<http://em.csuchico.edu/aap/Undergrad/help/ARigor.asp>)

### ACADEMIC RIGOR AT CALIFORNIA STATE UNIVERSITY, CHICO

Academic rigor means the consistent expectation of excellence and the aspiration to significant achievement. It should pervade the entire atmosphere of the University--teaching and learning, curriculum, evaluation of student and faculty, outreach, admissions, advising, and student life.

#### **Rigorous Teaching**

Rigorous faculty are role models for the behaviors and accomplishments the University seeks to promote. They demonstrate a high level of professionalism and commitment to the University and to their discipline and inspire in students an excitement about learning. Guiding students toward excellence, they

- Communicate high expectations and demonstrate them through a demanding syllabus and well-prepared classes.
- Encourage student-faculty contact in and out of class and offer conscientious advising and consistent availability.
- Encourage collaboration and active learning, fully involving students in the learning experience.
- Provide students early, prompt, and frequent feedback and develop appropriate assessment strategies.
- Emphasize time on task, clearly communicate time required for learning, make it clear that full-time study is full-time work, and design learning experiences so that homework matters.
- Develop approaches and strategies geared to diverse talents and ways of learning, while maintaining high standards of accountability.
- Reduce opportunities to engage in academic dishonesty and challenge its occurrence.

#### **Rigorous Learning**

Rigorous students are part of the equation of rigorous teaching and learning. A rigorous education is vigorous,

difficult, deeply satisfying work, and it requires a lifestyle conducive to achieving excellence. College is not a temporary diversion or a period of entertainment, but a fundamental piece of student character, citizenship, and employment future. A diploma and good grades from a demanding institution count for something. Rigorous students

- Set high personal standards, develop a strong sense of purpose, come to class well-prepared, and complete assignments on time.
- Develop an effective relationship with the instructor, in and outside of class, and make the most of University advising and other services.
- Treat fellow students and the classroom environment with complete respect. Give each class full attention and participation. Do not miss class, arrive late, or leave early.
- Accept continuing responsibility for learning and for grades earned.
- Approach each class in a professional manner, as if the class were real employment. Treat a full-course load as full-time work and spend no less time on it. Determine exactly what is expected.
- Experiment with all teaching and learning strategies used in classes, and also determine which work best for them.
- Demonstrate complete honesty and integrity.