AGRI 490: AGRICULTURAL EXPERIMENTATION
CSU, Chico – College of Agriculture
Spring 2009 – Course Syllabus

Instructor: Patrick Doyle
Class Schedule: Lecture - TR 11:00 am – 12:15 pm; Lab - F 11 am - 1:50 am
Class Location: PLMS 303 (Lecture); PLMS 321 (Lab)
Office Hours: W 12:00 – 1:00 pm; T,R 12:30-2:30 pm
Office Location: PLMS 227
Phone: Office - 530/898-6586
E-Mail: pdoyle@csuchico.edu

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 (available via WebCT, also)

Recommended texts –
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)
## Lecture Schedule

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

<table>
<thead>
<tr>
<th>Date</th>
<th>Subject Matter</th>
<th>Lab Topic (FRIDAY)</th>
</tr>
</thead>
<tbody>
<tr>
<td>T, 1/27</td>
<td>Introductions, Syllabus</td>
<td>WK 1: No Lab</td>
</tr>
<tr>
<td>R, 2/5</td>
<td>Sci. Method – cont’d</td>
<td></td>
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<tr>
<td>T, 2/10</td>
<td>Estimation – Statistics</td>
<td>WK 3: Field Work (Meet at Farm) – Sampling</td>
</tr>
<tr>
<td>R, 2/12</td>
<td>Estimation – Practice</td>
<td></td>
</tr>
<tr>
<td>T, 2/17</td>
<td>Experimental Terminology/Hypothesis Testing</td>
<td>WK 4: Asking the Right Questions – Learning by Doing (Tootsie Pop)</td>
</tr>
<tr>
<td>R, 2/19</td>
<td>Hypothesis Testing</td>
<td></td>
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<tr>
<td>T, 2/24</td>
<td>Designing an Experiment</td>
<td>WK 5: Power Analysis</td>
</tr>
<tr>
<td>R, 2/26</td>
<td>Power Analysis</td>
<td></td>
</tr>
<tr>
<td>T, 3/3</td>
<td>Replication, Randomization, Local Control</td>
<td>WK 6: Group Activity: Replication, Randomization, Local Control</td>
</tr>
<tr>
<td>R, 3/5</td>
<td>Experimental Designs/Analyses</td>
<td></td>
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<tr>
<td>T, 3/10</td>
<td>Simple Regression</td>
<td>WK 7: No Lab</td>
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<tr>
<td>R, 3/12</td>
<td>Multiple Regression</td>
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<tr>
<td>3/16-20</td>
<td>SPRING BREAK!!!</td>
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<tr>
<td>T, 3/24</td>
<td>Social Sciences - Surveys</td>
<td>WK 8: Regression</td>
</tr>
<tr>
<td>R, 3/26</td>
<td>T-Test/Proportional Tests</td>
<td></td>
</tr>
<tr>
<td>T, 3/31</td>
<td>ANOVA</td>
<td>WK 9: ANOVA, T-Tests, Proportional Tests</td>
</tr>
<tr>
<td>R, 4/2</td>
<td>Single Factor Designs – Completely Randomized</td>
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<tr>
<td>T, 4/7</td>
<td>Single Factor Designs – Local Control</td>
<td>WK 10: Single Factor Designs – Local Control</td>
</tr>
<tr>
<td>R, 4/9</td>
<td>Single Factor Designs – Local Control</td>
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<tr>
<td>T, 4/14</td>
<td>Factorials: Terms/Interaction</td>
<td>WK 11: Factorial Designs – Interaction</td>
</tr>
<tr>
<td>R, 4/16</td>
<td>Interaction: Factorial Designs</td>
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<tr>
<td>T, 4/21</td>
<td>Factorial Designs</td>
<td>WK 12: Experiment (Project)</td>
</tr>
<tr>
<td>R, 4/23</td>
<td>Factorial Designs</td>
<td></td>
</tr>
<tr>
<td>T, 4/28</td>
<td>Count Data</td>
<td>WK 13: Count Data</td>
</tr>
<tr>
<td>R, 4/30</td>
<td>ANOVA vs. Chi-Square</td>
<td></td>
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<tr>
<td>T, 5/5</td>
<td>Design Tree</td>
<td>WK 14: Design Exercise</td>
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<tr>
<td>R, 5/7</td>
<td>Design/Scenario Review</td>
<td></td>
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<tr>
<td>T, 5/12</td>
<td>Review (Dead Week)</td>
<td>WK 15: No Lab – STUDY!!!!</td>
</tr>
<tr>
<td>R, 5/14</td>
<td>Review (Dead Week)</td>
<td></td>
</tr>
<tr>
<td>R, 5/21</td>
<td>FINAL – 10:00 -11:50</td>
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**Attendance, Assignments and Class Requirements**

- You are expected to attend each class and to actively participate in discussions and planned activities.
- 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.
- **Assignments are due at the start of class. NO EXCEPTIONS. No late assignments will be accepted.**
- If you have a disability that requires special accommodations, you must contact a counselor at Disability Support Services, Building E, Room 107 (530) 898-5959. In addition, please let me know as soon as possible and I will provide you with the information you will need to receive services.
- 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 (no later than Friday, Feb. 6). During the third and fourth weeks of classes, COP forms to add or drop the course require an instructor signature (no later than Friday, Feb. 20). 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**

<table>
<thead>
<tr>
<th>Assignment</th>
<th>Points</th>
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</thead>
<tbody>
<tr>
<td>Lab Assignments/Problems</td>
<td>300</td>
</tr>
<tr>
<td>Sci. Review paper</td>
<td>100</td>
</tr>
<tr>
<td>Sci. Method/Experimental Design paper</td>
<td>100</td>
</tr>
<tr>
<td>Sci. Paper Analysis Presentation</td>
<td>100</td>
</tr>
<tr>
<td>Quizzes</td>
<td>150</td>
</tr>
<tr>
<td>Comprehensive Final Exam</td>
<td>150</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>900*</td>
</tr>
</tbody>
</table>

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

**Grading Scale:**

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

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, 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.

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 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.

For further explanation and definitions, refer to page 51 of the ’05-’07 University Catalog.