

COURSE SYLLABUS – ENTO/STAT 5080

SPRING, 2011

Logistics:

- **Meeting days:** Tuesday, Thursday
- **Meeting time:** 9:35 - 10:50 am
- **Meeting room:** 463 Health Sciences
- **Instructor:** David Legg
- **Office hours:** Mondays 11:00 – 12:00; Tuesdays and Thursdays 11:00 – 12:00; *elsewise by appointment*
- **Instructor's office, etc.:** 64 Agriculture, telephone: 766-3369, e-mail: DLEGG@UWYO.EDU
- **Text:** ENTO/STAT 5080 course packet (required); also consider *The Little SAS Book* (Dewiche & Slaughter), 4th edition (suggested)

Grading:

- a) **Homework:** There will be 8 to 10 homework assignments; most of which will have three components: 1) '*mechanics*', 2) '*what is it*'/'*what are they*', and 3) '*odds and ends*'. **Homework will constitute approximately half your grade.**

Mechanics: will deal with the mechanics of entering data into computer files, proof-reading the data, saving the data file, writing SAS programs, running SAS programs, and interpreting SAS printouts. **The '*Mechanics*' portion of each homework will be worth 5 points.**

What is it/What are they?: For all homeworks there will be at least one short paragraph describing research projects in the agricultural or natural resource sciences. **YOUR TASK** is to determine what statistical analysis should be used (if any), why it should be used, and what mitigating circumstances should be considered when conducting and interpreting the analytical results. **'What is it' will be worth 5 points.**

Odds and Ends: will challenge you on reviewing data sets, spotting odd values, reading SAS printouts to identify (and match) the degrees of freedom with what the degrees of freedom should be for a particular analysis, etc. Not all homeworks will have an Odds and Ends section. **When they do, the answers will be worth 5 points.**

- b) **Homeworks must be submitted in hard copy.**
- c) ***Late homeworks will NOT be graded.***
- d) **Examinations:** The mid term examination will be administered in class. The final examination will be administered in room 463 Health Sciences, on **Tuesday 3 May, from 10:15 to 12:15. Each exam will be worth 50 points.** There may be a take home problem associated with each exam.

Progression of lectures with respective target dates:

Lecture#	Date	Lecture Topic
1	January 11	Syllabus overview; an example with some tenets of designed studies
2	January 13	More about hypotheses, type I error, distributions, and p -values
3	January 18	Descriptive statistics
4	January 20	Hands-on tutorial with SAS: meet in Agriculture 142 – bring memory stick!
5	January 25	Descriptive statistics – <i>continued</i> –
6	January 27	Variance, standard error, confidence intervals
7	February 1	One group t test
8	February 3	Paired t test
9	February 8	Two group t test
10	February 10	One way ANOVA
11	February 15	The L.S.D and H.S.D
12	February 17	False positives; Linear contrasts
13	February 22	Orthogonality and power
14	February 24	MID-TERM EXAMINATION
15	March 1	Blocking designs
16	March 3	Factorial designs
17	March 8	Split plot in space design
18	March 10	Split strip in space design; repeated observations analyses
-	March 15	Spring Break, <i>classes excused</i>
-	March 17	Spring Break, <i>classes excused</i>
19	March 22	Simple linear regression (SLR) – overview
20	March 24	SLR – how to calculate the slope and y -intercept
21	March 29	SLR – standard errors and t tests for the slope and y -intercept
22	March 31	SLR – diagnostics
23	April 5	Curvilinear regression, begin polynomial regression
24	April 7	Polynomial regression; potential ‘traps’ of polynomial regression
25	April 12	Testing regression ‘lines’ – one form of ANCOVA
26	April 14	Testing regression lines – continued –
27	April 19	ANCOVA in ANOVA
28	April 21	Categorical data analysis: one dimensional tests
29	April 26	Categorical data analysis: two dimensional tests
30	April 28	Categorical data analysis: Fisher’s exact test
-	May 3	FINAL EXAMINATION 10:15 – 12:15

Instructor's Philosophy and some Salient Points:

- As Ken Gerow has stated, "Learning statistics is like learning a new language..." Practice is essential. The skill grows over time, if used.
- You will best learn how to use statistics when the statistical concepts and techniques are placed into the context of your thesis or dissertation.

- There is a prerequisite for this course; *you must have taken one statistics course prior to this one.*
- ***Please keep up!*** It is essential for you to not fall behind with homework assignments and readings. Work steadily throughout the semester. Find someone to work with on the homeworks and be sure to practice writing SAS programs to analyze the data.
- ***Please come to class!*** You will learn more by attending as many lectures as you possibly can.
- If you attend a professional conference (which I support), please get the notes from a classmate and, afterwards, come by and see me to make sure you have a firm understanding of the material.
- ***My promise to you:*** I will be as organized as is possible, for each and every lecture, to teach you the concepts of statistical analysis in the best way I know how.

A Personal Request:

Please switch off the 'ring' to your phones upon entering the classroom. *Thank you!*

Bring Your Course Packet to Class:

Your course packet is actually a 'bundled' set of handouts. Please bring these to class. You may wish to integrate these into a single notebook with your class notes. Alternatively, you may wish to write in your class notes which page(s) of the handouts to refer to certain analyses.

You will need to access the UW network.

Goals for the Course:

- Students become knowledgeable about the principles and concepts of statistical analysis.
- Students become able to recognize which statistical procedures to use on data that have been collected in a particular way, either through a designed experiment or an observational study.
- Students become able to recognize the limitations of using results from a statistical analysis and what those limitations may mean with respect to the interpretation of the results and the inferences they may wish to make.
- Students become proficient in transferring data from study sheets to computer files, writing SAS programs to analyze those data, interpreting the results from SAS printouts, and drawing conclusions.
- Students begin developing a "statistics" sense in describing and observing patterns in data, ferreting out oddities, and checking for compliance with basic assumptions (such as normality and equal variances).