Course Syllabus  
Stat 412  
Statistical Methods in Research I  
Summer 2015

Name: 
Course: Stat 412  
Instructor: Sweet

Office Hours: Monday-Friday: 11:30am – noon, 1:00pm – 1:30pm or by appointment  
Office: Neill 318  
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Web Address: http://www.math.wsu.edu/students/csweet/welcome.html

Class Time: CUE 407, Monday-Friday: noon – 1:00pm

Teaching Assistant: Lili Zhou

Course Description and Purpose: The main purpose of this course is to introduce important principles and techniques of statistical reasoning that are widely used in many fields. The central idea of drawing inferences from an analysis of data is presented via examples and exercises drawn from a variety of settings.

Pre-requisite: STAT 212, MATH 140, 171, or 202


Exams (Tests/Final): There will be three exams. If you must miss an exam, contact me in advance; DO NOT EXPECT MAKE-UP EXAMS. The exam dates will be announced at least one week in advance. All exams will be closed book, closed notes.

Homework: Homework will be assigned throughout the semester. If you have difficulty with homework, I or my TA will be more than happy to work with you. Assignments must contain the above heading and solutions should be well organized to receive full credit. Late homework, pages that have not been stapled or contain notebook fringe edges will not be accepted. One homework assignment will be dropped. You may use computer software for computations.

Grading:  
3 EXAMS  
HOMEWORK

A (93%-100%); A- (90%-93%); B+ (87%-90%); B (83%-87%);  
B- (80%-83%); C+ (77%-80%); C (73%-77%); C- (70%-73%);  
D+ (66%-70%); D (60%-66%); F(0%-60%)

75% (Each exam worth 25%).  
25%.

You can keep track of your grades on Blackboard (learn.wsu.edu). If a mistake occurs in entering one of your grades, you must let your TA know no later than two weeks after the entering of the grade.

Attendance: You are expected to attend class regularly and to arrive on time. If you miss class, it is your responsibility to find out assignments, notes, etc. Absence due to a conference, field trip or athletic team meet will have to be notified in writing, in advance to the instructor.

Academic Integrity: Please note that we take extremely seriously the university’s policy on the need for academic honesty in all your work. Any form of dishonesty in an assignment will lead to a zero on an assignment and we reserve the right to give a grade of F for the course as well. If needed, Student Conduct will be contacted. Visit the following site for more information regarding what constitutes academic dishonesty and the WSU procedures for handling cases of academic dishonesty.
http://www.conduct.wsu.edu/default.asp?PageID=343

WSU Safety Measures: Washington State University is committed to maintaining a safe environment for its faculty, staff, and students. Please visit http://safetyplan.wsu.edu and http://oem.wsu.edu/emergencies to access the Campus Safety Plan and emergency information.

Students with Disabilities: Reasonable accommodations are available for students with a documented disability. If you have a disability and may need accommodations to fully participate in this class, please visit the Disability Resource Center (DRC). All accommodations MUST be approved through the DRC (Admin Annex Bldg, Room 205). Please stop by or call 509-335-3417 to make an appointment with a disability specialist.
Some Comments:
1. If you are having difficulty with material in class, come and talk to me as soon as possible. I will be more than happy to work with you.
2. Do not hesitate to ask questions in class.
3. For your notebook, I suggest using a three-ring binder as opposed to a spiral notebook.
4. Come to class and participate.
5. Do not talk with a neighbor while I am lecturing.
6. If you will have to leave class early, please sit in the back close to the door.
7. Do not work on material for another class while I am lecturing.

The following is a projected schedule for topics in this class. It is a tentative schedule and is liable to change.

Tentative Schedule of topics:

Week 1-3:
- Introduction (Chapter 1 – Chapter 3)
  - Data Collection (Experiments, Observational Studies, and Surveys)
  - Concepts of population, sample, variable, biased sample,
  - Graphical representation of data
  - Mean, Median, Mode
  - Variance, Range, Standard Deviation
- Probability and Random Variables (C4)
  - Event, Sample Space, Random Experiment,
  - Rules of Probability
  - Random Variable
  - Normal Random Variables
  - Sampling Distribution of Sample Mean, Central Limit Theorem
- Inference about Mean (C5)
  - Point and Interval estimation of $\mu$
  - Size estimation for estimating $\mu$
  - Test for $\mu$, p-values
  - Power Calculations
  - t-distribution

Exam 1

Week 4-6:
- Inference about two means (C6)
  - Using Independent samples (Pooled t)
  - Using Dependent samples (Paired t)
- Categorical Data (C10)
  - Hypothesis Test for $\pi$
  - Hypothesis Test for $\pi_1-\pi_2$
  - Chi-Square Goodness of Fit Test
  - Chi-Square Test of Independence
- Analysis of Variance (C8-C9, C14-C15)
  - One Way Anova
  - Multiple Comparisons
  - Randomized Block Design
  - Two-Way Anova
  - Interaction

Exam 2

Week 7-8:
- Regression (C11-C12)
  - Simple Linear regression
  - Correlation
  - Multiple Regression
- Analysis of Covariance (C16)

FINAL EXAM: Friday, July 31

Topics may be added or removed from the List due to time constraints.