UGS 303: Research Methods (Summer 2011)

T and Th 1-3pm in BME 2.506

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Date	**Class**	**Lab**
July 12	Introduction and Strong Inference	*no lab*
14	What is an inquiry?	Database Searches, Strong Inference, Termites
19	Statistics	**Inquiry 1 Proposals due**
21	Statistics, Lab Safety and Inquiry 2	Statistics Practice
26	Peer Review and Authorship	**Inquiry 1 Reports and Presentations**
28	Ethics: Using Animals and People in Research	**Inquiry 2 Proposals due**
Aug. 2	The Art of Presenting and Writing	Ethics Discussion
4	Funding Research and Patents	Peer Review
9	What happens after graduation?	What is success?
Aug. 11	University Research (Who are all these people?), and Why do we not solve more problems?	**Inquiry 2 Reports and Presentations**

The schedule of class topics may change, so check the class webpage for updates.
The lab schedule, proposal, and report due dates will not change.

The class **webpage** is: www.bio.utexas.edu/courses/stuart/class.html. Slides from class will be posted on the class webpage after class. Updates, changes, and other critical information regarding the class will be posted on the Blackboard and/or on the webpage. Check the Blackboard regularly and be certain that UT has your correct email address.

Course Description: The job of a researcher is to explore the unknown. Done correctly research adds to what we know about how the universe works. Being involved in this endeavor is exciting and challenging. No one can teach you how to think, but by seeing what others have done and how they arrived at their successes or failures can give us information about what is, and is not, likely to succeed. We will look at some basic information about designing experiments, analyzing data, as well as about how research is done. The central component of this class will be experiments that you design and carry out. My overall goals are that you begin to develop a sense for how research works, how it fails, how we know things, and how to figure out what the next steps might be.

Class: T and Th from 1-3pm in BME 2.506. Class topics will give you the information and abilities necessary to carry out your inquiries. We will have some discussions as well as some lectures. I expect you to take notes and to think and reflect on what we are discussing in class.

Lab: Lab times will be arranged. Lab will be used for you to apply what you are learning in class. Sometimes we will practice applying material from class. Other labs will be used to prepare for or report on the experiments that you are doing. When you are working on your inquiries, there will be extra lab times scheduled for you to have access to the lab equipment.

Inquiry Descriptions:
Inquiry 1: observational only, no chemicals etc. (1 week) For this inquiry you will work by yourself to develop, carry out, and analyze an experiment. Your experiment should not involve the use of any chemicals or advanced data collecting equipment. You should be able to collect your data through observation. Other than that, you are free to design an experiment to your liking. The proposal is due in lab on T 7/19, and the written and oral presentations are due in lab on T 7/26.

Inquiry 2: open design (2 weeks) For this experiment you will work in groups of 2-4 students. Your group will develop, carry out, and analyze an experiment. You will need to decide what your experiment will be about, and what chemicals and/or data collecting material you will need to order. Each member of your group should have specific jobs, and the work should be divided evenly between all of the members. The proposal is due in lab on Th 7/28, and the written and oral presentations are due in lab on Th 8/11.

- While some preparation of inquiries will occur during lab, most of the work on inquiries will occur outside of the assigned lab times.
- You will need a lab notebook to keep track of your hypotheses and data. This should be a bound type of lab notebook with non-removable pages. It does <u>not</u> need to have carbon paper.

Assignments and Grading: Differently from most courses at UT, the intent of this course is not to assign a grade, but to prepare you to be productive researchers. The assignments and grading scheme are designed to help you attain this goal.

Before you carry out any of your experiments, you will need to get approval. This approval will be based on the experimental proposal that you will write for each inquiry. These three proposals will be worth 25% of your grade.

After the completion of each lab, you will submit a written report as well as take part in an oral presentation. These will be worth 50% of your grade.

For some of the lectures, homework will be assigned. This may be an assignment that we do in class or that you are asked to do outside of class. The outside class assignments will be announced in class and on the Blackboard. The homework will be worth 25% of your grade.

Assignments can be turned in late for reduced credit, the penalty for late work is a 10% reduction in grade per day late.

Equipment: During your inquiries you will be able to check out items for use outside of the classroom. You are responsible for all items in your care and must return them in a timely fashion. Failure to do so may result in financial bars.