Course Syllabus: Biometrics
Bio 290, Term 2, 2006/07, 3 credits

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Class: 10:20 AM to 12:35 PM TR
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Office Hours: 10:00 to 11:00 M, T, W, R, F
Additional hours by appointment. I have an open door policy, which means I will see students outside of office hours if I am available.

Texts

Pagano, M., K. Gauvreau. 2000. Principles of Biostatistics, 2nd. ed. Duxbury Press, Belmont, CA. ISBN: 0-534-22902-6.

Pagano, M., K. Gauvreau. 2000. Student Solutions Manual for Pagano/Gauvreau's Principles of Biostatistics, 2nd. ed. Duxbury Press, Belmont, CA. ISBN:0-534-37398-4

Dretzke, B.J., and K.A. Heildman. 2001. Statistics with Microsoft Excel, 3rdnd. ed. Prentice Hall, Upper Saddle River, NJ. ISBN: 0-13-147111-2

Description

Statistical analysis of biological data that is stochastic in nature. Techniques will include parametric tests and non-parametric tests. The concept of experimental design will also be introduced.

Objectives

Much of the numerical data obtained in the biological and health sciences has variation due to factors that are not controllable. Thus, biological data is stochastic in nature. This course is design to provide the student the mathematical techniques needed to analyze data that has built-in variability. Additionally, the student will be able to assess the degree of certainty that conclusions' based on stochastic data is warranted. This course is design to meet the needs of the student who plans to become a professional scientist and the student who plans to enter an allied life science profession such as medicine and dentistry.

Methods

The Just-in-time (Jitt) instructional methods will be used. Jitt involves the student reading the assigned text before coming to class, and completing on-line Warm-up exercises before coming to class. The results of the Warm-ups will then be used in developing the later materials for the class. Additionally, to help you develop your analytical skills, a series of questions presented at the end of each chapter will be assigned for you to complete (non-graded). Additionally, exercises involving your analysis of a data with the computer program, Excel 2003, will be assigned.

Co-requisite

CIS100 or other computer course. The instructor assumes you have a working understanding in how to use Excel to perform basic calculations and create graphs. An extra credit Excel Review Session will be held Friday, January 12, 2007. MTH140 or other advance mathematics course. This course requires a mastery or algebra, but concepts of inflection points, differentiation, and integration are used in explanation of the formulas used in this course.

Material covered:

Chapter	Topic	Pages	Exam
	Preface	v - vii	1
1	Introduction	1-5	1
2	Data Presentation	7-24, 30-36	1
3	Numerical Summary Measures	38-54, 59-64	1
4	Rates and Standardization	66-84, 89-95	2
6	Probability	125-149, 155-160	2
7	Theoretical Probability Distributions	162-185, 191-194	2
22	Sampling Theory	514-520, 524-525	3
8	Sampling Distribution of the Mean	196-203, 210-212	3
9	Confidence Intervals	214-224, 227-230	3
10	Hypothesis Testing	232-249, 254-257	4
11	Comparison of Two Means	259-272, 278-282	4
12	Analysis of Variance	285-294, 298-301	4
17	Correlation	398-407, 412-414	5
18	Simple Linear Regression	415-438, 443-447	5
15	Contingency Tables: The Chi-Square Test	342-360, 366-372	5
13	Nonparametric Methods	302-312, 317-321	5

COMPUTER PROGRAMING AND CALCULATORS

Since we live in an era of powerful computes, the mechanics of data entry and calculation will not be emphasized in this course. Instead data interpretation will be stressed. Several of the assigned homework problems contain large data sets included in a CD-ROM disk provided by your text book and through the publisher's web site. The data files for Excel can be found in the Excel directory of the CD-ROM. Excel is available in all the computer labs at UDM.

The use of the Windows operating system, basic data manipulation with Excel, and the operation Microsoft Explorer internet browser are taught in CIS100, a required Core Curriculum course. If you do not know how to use personal computers, please talk to the instructor.

For the exams, you will be required to have a scientific calculator that can calculate standard deviations and perform linear regression. Inexpensive (under $10.00) calculators can be purchase from a number of independent vendors or from the campus bookstore.

Course Web Site

Internet Resource	URL	Enrolling
Course web page on Blackboard	http://knowledge.udmercy.edu/ (Required)	The Registrar's Office automatically enrolls students into their Blackboard account. Your user name follows the following formula: firstname.lastname (lower case letters). Your password is your student ID number, unless you have already changed it. Class announcements are distributed by Email, thus; it is your responsibility to an active Email address in your Blackboard account.
Data file for text:	http://www.brookscole.com/cgi-wadsworth/course_products_wp.pl?fid=M20b&product_isbn_issn=0534229026&discipline_number=17	

Materials available at this web site include:

- Warm-up assignments
- Course syllabus
- A link to the publisher's text book World Wide Web site
- Instructions on how to use Excel that are not found in the required text
- Data sets needed to perform your homework
- Data sets needed for your take-home exams

Evaluations

Students' grades will be based on four exams and one outside-of-class assignments and the Warm-up assignments.

WARM-UPS

Pre-lecture assignment, known as "Warm-ups", will be assigned through Blackboard. These are required assignment that must be completed by 2:00 AM the night before class. Each Warm-up is worth between 5 and 10 points. The top 90% will count towards your grade. These assignments are graded on effort, completeness (you must answer in compete sentences). These should be performed independently. If you obtain help from others, you must declare so when you submit your Warm-up on line via Blackboard. This will lower your grade by 2 points. If you do not declare the help from others, you will forfeit all warm-up points. The top 90% of warm-up scores will be normalized to 50 points to calculate final grades.

HOMEWORK

The key to success in this course is completion of the homework. Thus, PHOTOCOPIES of completed homework assignments must be turned-in one week after the end of the chapter's instruction. Collaboration with other students is encourage (collaboration tools are available through Blackboard), but the work submitted must be your own (i.e., do not copy other students answers; you must perform your own calculations). Homework will be graded on completeness and spot-checked for accuracy.

EXAMINATIONS

Examinations (130 points each) will consist mostly of problem solving questions. Short answer, essay, and definitions may also be included. Portions of the first three each exam will include a take-home component. The last exam will be given in one of the university's computer lab. It will consist of both closed book questions, and open-book computer based questions.

LATE POLICY

Make-up exams are only given if a student is absent due to a legitimate excuse (i.e., illness, death in the family, etc.). The make-up exam format will be similar to the regular exam format. You must contact the instructor before the exam if possible, or within 48 hours of the exam period. Failure to do so will result in you forfeiting your right to take a make-up exam. Make-up exams must be taken as soon as possible. I will not return graded exams until all make-up exams have been taken.

Extensions for outside-of-class assignments are only given due to extreme circumstances (e.g., hospital stay, etc.). You must contact the instructor before the due date, if possible, or within 48 hours afterwards. Failure to do so will result in you forfeiting your right for an extension. Grades for late assignments (i.e., not an approved

extension) will be reduced by 5% for each day it is late.

Important Dates

The University's calendar can be found at the following web address:
http://www.udmercy.edu/academics/acad_cal.htm

Winter 2006-2007

January 8	Classes Begin
January 12	Last Day to Declare Audit or Pass/Fail Option
January 15	Martin Luther King, Jr. Holiday (No classes/Offices Closed)
January 26	Application Deadline for May/June/August 2007 Graduation
February 2	Last Day to Drop a Class without a "W"
February 27	Mid-term grades Due from Faculty
March 5-10	Mid-Winter/Spring Break (No classes/Offices Open)
April 6-8	Easter Recess - University Closed
March 30	Last Day to Withdraw from Class for Winter with "W"
April 23-28	Final Exam Week

Schedule of Evaluations

Evaluation	Date	Points
Extra credit Excel instruction	Friday, January 12, 2007 Location TBA	10
Warm-ups	Due before most class periods (top 90% will count)	50
Homework	Due one week after the instructor completes classroom instruction	50
Exam I	Thursday, January 25	130
Exam II	Thursday, February 15	130
Exam III	Tuesday, March 13	130
Exam IV	Tuesday, April 3	130
Final Exam	Tuesday, April 24, 11:00 to 12:50, Engineering Rm. 140	175
	Total points possible:	**795**

Grades

To calculate your grade, use the following formula:

percent score = (sum of points received)/(sum of points possible) X 100

You are guaranteed the following minimum grade based upon the following percentile scale:

A = 100 to 95%	**A- = 94 to 90%**	
B+ = 89 to 85%	**B = 84 to 80%**	**B- = 79 to 75%**
C+ = 74 to 70%	**C = 69 to 65%**	**C- = 64 to 60%**
D+ = 59 to 55%	**D = 54 to 50%**	**F = 49 to 0%**

I do NOT grade on a standard curve. I reserve the right, however, to lower the grading requirements if the tests

are sufficiently challenging to warrant a different grading scale.

Class Cancellation Policy:
Class will only be canceled if the President's office closes the university, or if the Dean's office cancels class due to a special event (e.g., Technology Discovery Day).

Special Needs Accommodations
Students with special needs due to disabilities should contact University Academic Services / Disability Support Services (UAS/DSS) located on the ground flour of the Student Center (578-0310) to make arrangements. If you have emergency medical information, or need accommodations in case of building evacuation, inform the instructor as soon as possible.

Courtesy
You must be courteous to your fellow classmates and to the instructor. To this end, talking during lectures is not permitted. If you disturb others in class, the instructor will require you to leave. However, we strongly encourage questions and comments. To be fair to all, the instructor will act as the moderator.

The following etiquette will be used with cellular devices:

- pagers will be placed in a noiseless mode (i.e., vibrate or off)
- cellular telephones will be off or on noiseless mode. If an emergency occurs, the student will leave the room before turning on his/her cellular phone

Academic Integrity
You are expected to follow the norms of academic conduct. You will adhere to the policies outlined in Appendix A of the 2006/07 Student Handbook of Policies and Procedures. The instructor recommends that you read this appendix. Students will be required to sign honor statements for assignments outside of class. Students caught plagiarizing or cheating will received a grade of zero for that assignment. At the instructors' discretion, instances of academic misconduct may be reported to the Dean's Office. The following activities are considered cheating:

1. Submitting computer files/printouts that are not of one's own sole effort (i.e., no group work on take-home exams).
2. Looking at someone else's exam.
3. Looking at notes or books during an exam.
4. Looking at an answer on another student's calculator.
5. Looking at information on electronic devices other than calculators.
6. Giving information to another student during an exam.
7. Collaborating with someone on graded take-home assessments. (excludes end of chapter homework)