

CHS 501: Introduction to Biostatistics for the Health Scientist  
Winter quarter, 3 credit hours

**Faculty:** The course will be taught by Mary Kwasny, ScD. Her office phone is 312-942-8349, and is available M, W-F. She is not in the office on Tuesdays. The TA for this course is Sarah Peterson, MS, RD, CNSC. Her office number is 312-942-3988.

**Office Hours:** By appointment, and can be arranged before or after any lecture or lab. Feel free to post question on the course website. They will be answered during the work week within 24 hours. (Note, if you post late on Friday, it may not be answered until the following Monday)

**Classes:** The course is an introductory-level Biostatistics course that would meet for lecture for all students Monday from 1-2:20 (AcFac 985), and an applied computer lab in several Wednesday sessions (AcFac903) from 1-2:20.

This course is geared towards College of Health sciences students, in particular: Audiology, Clinical Nutrition, and Perfusion students who will take a basic research course and who will use (sometime in the near future) basic statistical methods for their masters thesis or bachelors level project.

**Required Book:** Dawson and Trapp. Basic and Clinical Biostatistics (4<sup>th</sup> Ed). Lange Medical Books/McGraw Hill. ISBN: 0-07-141017-1. (Referred to in course outline as D&T)

**Recommended Resource:** SPSS Survival Manual, (3<sup>rd</sup> Edition) Open University Press, ISBN: 0335223664. Note: if you are computer savvy, there is really no need for you to get this book, however, if you feel very lost using SPSS, this is a very good reference.

**Other books:** you may find helpful (available at most local bookstores)

- Gonick and Smith. The Cartoon Guide to Statistics
- Rowntree. Statistics without Tears: A primer for Non-Mathematicians
- Jaisingh. Statistics for the Utterly Confused.
- Lang and Secic. How to Report Statistics in Medicine.
- Marija Norusis. SPSS 13.0 Guide to Data Analysis

**Course Objectives:**

1. Judge the adequacy with which conclusions are drawn from presented data.
2. Determine the appropriate descriptive statistics and tests to use in various settings.
3. Possess the ability to estimate appropriate descriptive statistics, run basic hypothesis tests, and know when to obtain additional statistical support.
4. Present research in a comprehensive, understandable manner.
5. Draw proper conclusions from results obtained from research data.

*Tentative Course outline:*

Week	Topic	Reading(D&T) and Homework Assignment Schedule
1: 9/15/2008 Lecture (AAF 985)	Basic introduction of study designs Variable types, descriptive statistics, graphs	Ch 1 and 3, in Ch 3 – <b>exclude</b> key concept #10 (Stem and leaf plots), <b>exclude</b> section on vital statistics pg 42-45. In section on the relationship between two nominal characteristics, only <b>read</b> sections on relative risk, and the odds ratios.
9/17/2008 - Lab Rm 903	Intro to SPSS, how to input data, descriptive statistics and graph generation	
2: 9/22/2008 – Lecture (AAF 985)	Introduction to Probabilities, Introduction to Hypothesis testing	Ch 4, and Ch 5 Key concepts 6 – 10 (pg, 104-109).
9/24/2008 - Lab Rm 903	More in SPSS (data views, editing graphs) and SPSS nomenclature	HMWK 1: summary and graphs due
3: 9/29/2008 – Lecture (AAF 985)	One Sample statistics (paired groups): paired t-tests and confidence intervals, Kappa and McNemar's test of proportions, Wilcoxon Signed Rank test.*	Ch 5 - <b>exclude</b> key concept #19, pg. 125 – 131 (Sample Sizes)
10/1/2008 - Lab Rm 903	One Sample (paired groups tests)	HMWK 2: probabilities and HT due
4: 10/6/2008 – Lecture (AAF 985)	One Sample statistics (paired groups): paired t-tests and confidence intervals, Kappa and McNemar's test of proportions, Wilcoxon Signed Rank test. (CONTINUED)	
10/8/2008 – (AAF 710)	<b>EXAM #1 (through one sample tests)</b>	
5: 10/13/2008 – Lecture (AAF 985)	Two Independent groups (Independent t-test, Wilcoxon Rank sum (Mann-Whitney test), Chi-square (Fisher's Exact Test)	Ch 6 – exclude z-test for comparing proportions, and exclude sample size calculations
10/15/2008 - Lab Rm 903	Two sample comparisons	HMWK 3: One sample Comparisons due
6: 10/20/2008 – Lecture (AAF 985)	Comparing 2+ (k) independent groups (ANOVA, 2 way ANOVA, Kruskal-Wallis tests)	Ch 7 – exclude sections on Newman-Keuls and Dunnett's procedures, Repeated Measures Designs, sample size calculations
10/22/2008 - Lab Rm 903	SPSS how to compare k groups	HMWK 4: Two sample comparisons due
7: 10/27/2008 – Lecture (AAF 985)	Comparing 2+ (k) related groups (RM ANOVA, Friedman's test)	Ch 7 – Repeated Measures Designs (p 181); also reread section from Ch 1 on correlation coefficients.
10/29/2008 – Lab Rm 903	SPSS how to compare k groups	HMWK 5: k-sample comparisons due

8: 11/3/2008 – Lecture	Correlation and Simple Linear Regression	Ch 8 – page 190-208
11/5/2008 – (AAF 710)	<b>EXAM #2 (Through K group comparisons)</b>	
9:11/10/2008 – Lecture (AAF 985)	Multiple linear regression	Ch 10 – pg. 245-255
11/12/2008 Lab (METC 903)	SPSS Simple Linear regression, recoding and how to fit multiple linear regression models	
10: 11/17/2008 Lecture (AAF 985)	Catch-up and Review	HMWK 6: Correlations and Simple Linear Regression due
Lab (METC 903)	<b>Lab Practicum</b>	
Exam week	<b>Cumulative Final</b>	

- *The book erroneously calls the Wilcoxon Signed Rank test the Mann-Whitney test. We will see later in the course, that the Mann-Whitney test is actually the same as the Wilcoxon Rank Sum test (2 independent groups), not the Wilcoxon Signed rank test (2 related groups).*

**Homework Assignments:** will be available to download from the Course website. You must submit them via the course website as well by the due date and time. **NO LATE ASSIGNMENTS WILL BE ACCEPTED\***. For each assignment, you will submit TWO MICROSOFT WORD documents (submit all homework questions in one file, in addition to a word document containing your SPSS output). Be sure to include your name in both files. Feel free to name the files with your lastname, and make it clear which file is your answers, and which is your output. Suggested names (if I were the student): hmwk1kwasny.doc and hmwk1kwasnyoutput.doc  
\*if there is a justifiable reason (documented illness, documented work-related conference) that you cannot submit your homework on time, please contact your TA, Sarah Peterson to arrange an acceptable solution.

**Grading:** Your grade will be based on several aspects of the course. I have also usually incorporated some sort of a curve (which shall remain my secret statistical equation, but will only be a benefit to you) on grades as well. The best advice is to not count on it, but be happy if you have a higher grade than you calculate yourself! The bare minimum grades will be calculated as such:

Homework percentage:	20%
Computer Labs percentage:	10%
Exam I percentage:	10%
Exam II percentage:	20%
Lab Practicum percentage:	20%
Cumulative Final percentage:	20%

Grades associated with percentages will be assigned as follow: A =90-100%, B = 80-89%, C = 70-79%, D = 60-69%, F = below 60%.

The following section pertains to Rush Academic Policies, and was copied from the Rush University Website. For further details, see the Rush University Website.

#### Policy Against Harassment

The harassment of any member of the Rush University Medical Center community (i.e., employee, faculty, house staff, or student) because of age, ancestry, color, disability as defined by Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act, gender, gender identity and/or expression, marital or parental status, national origin, pregnancy, race, religion, sexual orientation, veteran's status or any other categories protected by federal or state law, is prohibited and will not be tolerated.

#### Policies and Procedures for Students with Disabilities

The University provides reasonable accommodations to all students on a nondiscriminatory basis consistent with legal requirements as outlined in the Americans with Disabilities Act (ADA) of 1990 and the Rehabilitation Act of 1973. A reasonable accommodation is a modification or adjustment to an instructional activity, facility, program or service that enables a qualified student with a disability to have an equal opportunity. To be eligible for accommodations, a student must have a documented disability as defined by the ADA and Section 504 of the Rehabilitation Act of 1973. Both the ADA and Section 504 define disability as (a) a physical or mental impairment that substantially limits one or more major life activities of such individual; (b) a record of such impairment; or (c) being regarded as having such a condition.

If this topic is pertinent to you, the College of Health Sciences contact for RUSDAT is Richard Peach, Ph.D. (312) 942-3293 [Richard\\_Peach@rush.edu](mailto:Richard_Peach@rush.edu)

#### Rush University Statement on Academic Honesty

Rush University students and faculty belong to an academic community with high scholarly standards. As essential as academic honesty is to the relationship of trust fundamental to the educational process, academic dishonesty violates one of the most basic ethical principles of an academic community, and will result in sanctions imposed under the University's disciplinary system. A partial list of academically dishonest behaviors that would subject a student to disciplinary action includes:

- **Cheating:** Using unauthorized material or unauthorized help from another person in any work submitted for academic credit
- **Fabrication:** Inventing information or citations in an academic or clinical exercise
- **Facilitating Academic Dishonesty:** Providing unauthorized material or information to another person
- **Plagiarism:** Submitting the work of another person or persons, as one's own without acknowledging the correct source
- **Unauthorized Examination Behavior:** Conversing with another person, passing or receiving material to/from another person or temporarily leaving an examination site to visit an unauthorized site

As a consequence of any perceived Academic Dishonesty, my first "warning" is usually "Share the work, share the credit." For example, if you earn an 8 out of 10, and your work is too similar to another student's, you will both receive scores of 4. The second violation will result in 0. Any third violation will be reported to the Chair of your Department, and the Dean of the College.