Statistics Options

The following are graduate level statistics courses appropriate for students in the Nutritional Sciences Graduate Program (NSGP):

1. Rutgers Department of Statistics and Biostatistics Graduate Program Courses (960)
  http://catalogs.rutgers.edu/generated/nb-grad_current/pg399.html is a link to the graduate catalog
  pages with descriptions of the statistics courses taught by the statistics department.

Interpretation of Data I

16:960:586 *INTERPRETATION OF DATA I (3)* Modern methods of data analysis with an emphasis on statistical computing: univariate statistics, data visualization, robust statistics, nonlinear models, logistic regression, generalized linear models (GLM), and smooth regression (including GAM models). Expect to use statistical software packages, such as SAS (or SPSS) and Splus (or R) in data analysis. *Prerequisite: Level IV statistics.* NSPG Notes: Level IV statistics can be fulfilled by an advanced undergraduate statistics course at the 400 level; the instructor for the course must be contacted to convey information about completion of undergraduate statistics to obtain permission to register for the course. *Corequisite: 16:960:563*

> **16:960:563 Regression Analysis (3)** Review of basic statistical theory and matrix algebra; general regression models; computer application to regression techniques; residual analysis; selection of regression models; response surface methodology; experimental design models; and analysis of covariance. Emphasis on applications. *Prerequisite: Level IV* **statistics**

16:960:590 *DESIGN OF EXPERIMENTS (3)* Fundamental principles of experimental design; completely randomized variance component designs; randomized blocks; Latin squares; incomplete blocks; partially hierarchic mixed-model experiments; factorial experiments; fractional factorials; and response surface exploration. *Prerequisite: 01:960:484 or 401 or equivalent.* NSGP notes: Completion of an upper level undergraduate statistics course (3 credits) at your undergraduate institution is sufficient; the instructor for the course must be contacted to convey information about completion of undergraduate statistics to obtain permission to register for the course. This course is particularly appropriate for students conducting research with laboratory animal models. This course provides a strong background in statistics and allows students to learn SAS. The MS students in Biostatistics take this course, and typically none of their doctoral students take this course.

16:960:584-585 Biostatistics I and II NSGP Notes: the 2nd portion or Biostatistics II focuses on clinical applications and can be taken without Biostatisics I as a pre-requisite. Biostatistics I and II are not sequential. Biostatistics I requires more preparation than Biostatistics II or Design of Experiments.

16:960:584 *BIOSTATISTICS I-OBSERVATIONAL STUDIES (3)* Statistical techniques for biomedical data. Analysis of observational studies is emphasized. Topics include measures of disease frequency and association; inferences for dichotomous and grouped case-control data; logistic regression for identification of risk factors; Poisson models for grouped data; bioassay. SAS used in analysis of data. *Prerequisites: One year of calculus and Level V statistics.* NSGP notes: Level V statistics is equivalent to an entry graduate (500) level statistics course.

19:960:585 *BIOSTATISTICS II-CLINICAL TRIALS (3)* Statistical and practical design, conduct, and analysis of controlled clinical experiments. Topics include introduction to phases of clinical trials; power and sample size estimation; randomization schemes; study design; human subject considerations and recruitment; data

collection design and process; data monitoring and interim analysis; baseline covariate adjustment and data analysis; and writing and presenting results. Standard statistical software used for randomization, power/sample size estimation, and data analysis; 16:960:584 Biostatistics I is not required. **Prerequisite: Level IV statistics.** _NSGP Notes:_ Completion of an upper level undergraduate statistics course (3 credits) at your undergraduate institution is sufficient; the instructor for the course must be contacted to convey information about completion of undergraduate statistics to obtain permission to register for the course.

2. Statistics Courses Outside of the Rutgers Statistics Department (the pre-requisite for these courses is at least one undergraduate course in statistics)

2a. UMDNJ, School of Public Health - Introduction to Biostatistics (PHCO 0504) This course goes through practical applications of using statistics so the student has a good grasp on the subject afterwards (as long as they have also taken an undergraduate basic stats course). _NSGP Notes:_ It's more difficult to register in the Fall than in the Spring semester.

http://sphweb02.umdnj.edu/sphweb/files/bulletin/09-12/Bulletin%202009-2012_Section4.pdf

Information about dummy course for Rutgers students to take courses at UMDNJ

http://nbregistrar.rutgers.edu/grad/medical_school.htm

MED SCHOOL EXCHANGE, 16:001:815, or 34:001:815 for graduate students

Following completion of Introduction to Biostatistics (PHCO 0504), advanced coursework in statistics is also offered by the School of Public Health including:
QNME 0612 Linear Models: Regression and Analysis of Variance
BIST 0661 Regression Methods for Public Health Studies

2b. The School of Education offers 2 statistics courses: Statistical Methods I and Statistical Methods II, 15:291:531, 532 _(students need to take both semesters to fulfill requirements of NS graduate program)_

http://syllabi.gse.rutgers.edu/home/15-291

NSGP Notes: If these courses are taken, both Statistical Methods I and II are required since Statistics I alone will not be sufficient coverage of statistics for the Nutritional Sciences Graduate Program. Statistical Methods II covers t-tests, ANOVA and regression. These School of Education (School 15) courses are equivalent to GSNB (School 16) courses 16:960:531 and 532 offered by the Department of Statistics

3. Undergraduate Courses are an option only if a student has never had an undergraduate course in statistics. The recommended course is Basic Stats for Research 01:960:401. An alternative is Basic Applied Statistics 01:960:484, which requires entry level exposure to the theory of probability as a pre-requisite. _NSGP Notes:_ If a student is in the doctoral track in Community and Applied Nutrition, he or she will need to take at least 1 additional graduate level statistics course and likely 2 more courses to meet the requirement of statistics through regression.

01:960:401. Basic Statistics for Research (3)
Prerequisite: 01:640:115(pre-calculus) or equivalent. As applied in fields other than statistics; treats research

projects dependent on the use of observed data from planned experiments. Includes inference methods in estimation and hypothesis testing, and general linear models.

01:960:484. Basic Applied Statistics (3)
Prerequisite: One of the following coures: 960:201, 211, 285, 379, 381, 401 or an equivalent course in basic probability theory. See credit restrictions for Level II Statistics.
Estimation, hypothesis testing, chi-square methods, correlation and regression analysis, basis of design of experiments.

NSGP Notes: While it is acceptable to take undergraduate 300 and 400 level courses that can count towards the graduate degree, usually 1-2 courses are taken at this level, as needed. If more courses are of interest to the student, then the bylaws of GSNB state "With the approval of the program director, a maximum of 12 credits of undergraduate coursework may be applied towards a graduate degree".