

NORTH CAROLINA STATE UNIVERSITY COURSE ACTION FORM

For instructions, please consult: http://www.ncsu.edu/provost/academic_programs/courses/crsindx.html

TYPE OF PROPOSAL:	
New Course	_____
Course to be dropped	_____
Course Review	_____
Course Revision*	__X__
GER List Action	_____
Dual-level Course	_____
* REVISION IN:	
Prefix/Number	_____
Title/Abbreviated Title	_____
Scheduling	_____
Credit Hours/Contact Hours	_____
Grading Method	_____
Pre/Corequisite	_____
Restrictive Statement	_____
Catalog Description	_____
Content	_____
Student Learning Outcomes	__X__
Proposed Effective Date: ____/____/____	
Approved Effective Date: ____/____/____	

DEPARTMENT/PROGRAM _____ Statistics _____

COURSE PREFIX ____ST_____ NUMBER ____311_____

PREVIOUS PREFIX/NUMBER _____

COURSE TITLE ____Introduction to Statistics_____

ABBREVIATED TITLE ____INTR TO STATISTICS_____ (18 including spaces)

SCHEDULING: Fall __X__, Spring __X__, Summer __X__, Every Year __X__
Alt. Year Odd ____ Alt. Year Even ____ Other _____

CREDIT HOURS __3__ OFFERED BY DISTANCE EDUCATION ONLY? __N__

CONTACT HOURS: Lecture/Recitation __3__ Seminar____ Laboratory____ Problem____
Studio____ Independent Study/Research____ Internship/Practicum/Field Work____

GRADING: ABCDF __X__ or S/U ____ DATE OF LAST ACTION: __8/92_____

PREREQUISITE(S) _None_____

COREQUISITE(S) _None_____

PRE/COREQUISITE for Following Course(s) _____

RESTRICTIVE STATEMENT(S) _Credit not allowed if student has prior credit for another ST
course or BUS 350

CATALOG DESCRIPTION (Limit to 80 words):

Examining relationships between two variables using graphical techniques, simple linear regression and correlation methods. Producing data using experiment design and sampling. Elementary probability and the basic notions of statistical inference including confidence interval estimation and tests of hypothesis. One and two sample t-tests, one-way analysis of variance, inference for count data and regression.

CURRICULA/MINORS FOR WHICH COURSE IS DESIGNED:

Required: __Various CLAS, CNR and CHASS programs, e.g., SMB, SFW, LAP, ASA_____

Elective: __Various, e.g., SBO, IAS, TXM_____

GER LIST(S): __Mathematical Sciences_____

INSTRUCTOR RESPONSIBLE FOR COURSE/RANK: __Pam Arroway_____ Assistant Professor

ANTICIPATED ENROLLMENT PER SEMESTER: __650__ Maximum No./Sect.: __65__ Multiple Sections: Yes __x__ No ____

DOCUMENTATION AS REQUIRED:	
<i>Please number all documentation pages attached to course action form.</i>	
Course Justification	__1__
Proposed Revision(s) with Reasons	__1__
Enrollment for last 5 years	__1__
Resources Statement	__1__
Consultation with other Departments	_____
GER Course Documentation	__1__
GER category objectives	__1__
GER student learning outcomes	__1__
Means of assessing GER outcomes	__2__
Syllabus (Current and Proposed)	__2__

RECOMMENDED BY:

Head, Department/Program Date

ENDORSED BY:

Chair, College Courses & Curricula Committee Date

College Dean Date

Chair, University Courses & Curricula Committee Date

Chair, Council on Undergraduate Education Date

APPROVED:

Provost's Office Date

ST 311 Course Action

A. Course Justification

The aim of the course is to teach students to think about data, to use sampling and experimental design to produce data and to use statistical methods to analyze data with understanding. Students will learn to think about how data are produced, how they may be displayed and summarized, both numerically and graphically, and to be alert to the existence of and problems created by outliers. Students will understand the logical and probabilistic reasoning behind statistical inference and learn to apply common statistical methods within this context. Consistent with trends in statistics education, this course has moved towards giving more attention to data and statistical reasoning and away from presentations of mathematical theories of inference and large numbers of statistical formulas and methods.

B. Proposed Revisions

Include GER student learning outcomes

C. Enrollment for the last five years

Academic Year	Enrollment
2002-2003	1359
2001-2002	1262
2000-2001	1194
1999-2000	1129
1998-1999	1087

D. Resources Statement

The course revision does not require any additional resources.

E. Consultation with other departments

F. GER Course Documentation

ST 311 is available to all undergraduate students with only college algebra as a prerequisite. Multiple sections are offered in both fall and spring semesters, and one section is offered during the summer.

- a. GER Category Objectives: ST 311 is listed in the Mathematical Sciences GER list. Each course in the mathematical sciences will provide instruction and guidance that help students to:
 - i. Improve and refine mathematical problem-solving abilities
 - ii. Develop logical reasoning skills.
- b. GER student learning outcomes:
 - i. Category Objective (i)
 1. Students will be able to summarize data using basic numeric and graphical summaries including means, medians, quartiles, variances, correlation, histograms and scatter plots.
 2. Students will be able to implement common statistical techniques including point estimation of a mean, variance or proportion, confidence intervals and hypothesis tests regarding these parameters, least-squares regression and inference for regression parameters.
 - ii. Category Objective (ii)
 1. Students will be able to describe important features of data summary techniques for the purposes of interpreting summaries and/or comparing data sets.
 2. Students will be able to translate a question of interest into an appropriate data collection and/or data analysis plan. This includes choosing appropriate data summaries and estimation and inference techniques from among those presented in the course.
 3. Students will be able to critique a data collection and analysis completed by someone else. This includes recognizing the limitations of the statistical techniques presented in the course.

- c. Means of assessing GER outcomes: These outcomes will be assessed through traditional homework assignments and exams. Example homework/exam questions for each objective are given below.
- i. Category Objective (i)
 1. For the following data set, calculate the mean and median of the data set: 5, 7, 9, 8, 9, 6
 2. A shipment of bolts sent to a customer is specified to contain 6 inch bolts. The customer should expect some variation around this value from bolt to bolt, but suspects that the bolts are on average, shorter than 6 inches. He selects a random sample of 100 bolts from the shipment. The sample mean was 5.99 inches and the sample standard deviation was 0.01. Using a significance level of $\alpha=0.05$, conduct a hypothesis test to see if the population mean is less than 6 inches.
 - ii. Category Objective (ii)
 1. The mean and median are both measures of central tendency. For a data set which is known to be severely right-skewed, which measure of central tendency is preferred and why?
 2. Does fast driving waste fuel? Here are data for a British Ford Escort. [include data here] Choose an appropriate graphical summary technique that shows the relationship between speed and fuel used. Describe the form of the relationship. Calculate an appropriate numerical summary of the relationship. Is the relationship reasonably strong or quite weak? Based on your results, how would you respond to the question of interest “Does fast driving waste fuel?”
 3. **TV viewing and aggression.** A typical hour of prime-time television shows 3 to 5 violent acts. Research shows that there is a clear association between time spent watching TV and aggressive behavior by adolescents. Nonetheless, it is hard to conclude that watching TV causes aggression. Suggest several lurking variables describing an adolescent’s home life that may be confounded with how much TV he or she watches.

G. Syllabus

- a. Proposed lecture schedule

Weeks	Topic
1-2	One-variable Statistics
2-4	Two-variable Statistics
5-6	Designing/Interpreting Experiments
7-9	Probability and Sampling Distributions
10-14	Inference for Means
13-14	Inference for Regression
14-15	Inference for Proportions

- b. See attached example syllabus for more details