GEORGIA PERIMETER COLLEGE
MATHEMATICS ACADEMIC GROUP
COMMON COURSE OUTLINE

COURSE ABBREVIATION    Math 1431

CREDIT HOURS            3

COURSE TITLE            Introduction to Statistics

PREREQUISITES           Successful completion of any collegiate level mathematics course.

CATALOG DESCRIPTION
This course is designed for students whose programs require a course in statistics
as well as for those who wish to elect such a course. Topics to be covered include
descriptive statistics, basic probability, discrete and continuous distributions,
sample estimation of parameters, hypothesis testing, tests on means and proportions, chi-square tests,
correlation, and linear regression.

EXPECTED EDUCATIONAL RESULTS
As a result of completing this course, the student will be able to:
1. Analyze statistical problems using critical thinking skills, such as
deciding on appropriate statistics to measure and suitable tests
to be performed;
2. Support statistical analyses using the course-required calculator
   whenever possible;
3. Define basic descriptive and inferential statistical terms;
4. Select a random sample;
5. Construct frequency and relative frequency tables and histograms,
stem-and-leaf diagrams, boxplots, and scatter diagrams;
6. Determine the mean, median, mode, standard deviation, range, and
   quartiles for a set of data;
7. Interpret and apply z-scores;
8. Compute regular and conditional probabilities of events from a
   contingency table;
9. Using contingency tables, determine the probability of the compound
   event A and B, and the probability of the compound event A or B.
10. Determine the mean and standard deviation for a discrete probability
    distribution;
11. Make appropriate checks for normality of distributions and apply the
    properties of normal and standard normal distributions;
12. Use the standard normal distribution to determine probabilities.
13. Interpret the Central Limit Theorem and compute the standard error of
    the mean and its standard deviation;
14. Determine confidence intervals for the mean and proportion of one population
    for large samples or normally distributed populations;
15. Apply the basic model of hypothesis testing and select the appropriate
distribution to make inferences about a population mean and proportion or the
difference between two population means and proportions, including the use
of z-, t-, statistics;
16. Test experimental results against known distributions (goodness-of-fit)
and the statistical independence of two variables in experiments
where results are organized in contingency tables;
17. Write a regression line equation which best represents data relating two
variables and interpret and/or make predictions from the line;
18. Compute the linear correlation coefficient for a regression line and
interpret its significance;
19. Identify components of Statistical Design.

GENERAL EDUCATION OUTCOMES
I. This course addresses the general education outcome relating to communication
as follows:
   A. Students improve their listening skills by taking part in general class
discussions and in small group activities.
   B. Students improve their reading comprehension by reading and discussing the
text and other materials. Reading mathematics requires skills somewhat
different from those used in reading materials for other courses and
these are discussed in class
   C. Unit tests, examinations, projects, and other assignments provide
opportunities for students to practice and improve mathematical writing
skills. Mathematics has a specialized vocabulary that students are
expected to use correctly.

II. This course addresses the general education outcome related to problem solving
and critical thinking as follows:
Students are assessed in a variety of ways that allow them to demonstrate
individual and group problem-solving skills. Opportunities are also provided
on tests and other assignments for students to employ critical-thinking skills.

III. This course addresses the general education outcome related to using mathematical
skills with quantitative data as follows:
The instructional goals for this course are to provide a sound foundation for
the comprehension and application of statistics. Students completing this
course successfully will be able to interpret, understand, and communicate
fundamental ideas about quantitative data.

COURSE CONTENT
1. Descriptive Statistics (data analysis)
2. Probability and Probability Distributions
3. Inferential Statistics
4. Linear Regression and Correlation
ENTRY LEVEL COMPETENCIES
Upon entering the course, the student should be able to:

1. Analyze mathematical problems using critical thinking skills, such as estimation, reasonableness of answer, and writing and interpretation of results;
2. Use algebraic symbols and notation to make meaningful statements;
3. Use a calculator to perform arithmetic operations;
4. Write the equation of a line, given the appropriate information, and solve applications for which linear equations are mathematical models;
5. Solve linear inequalities and relate solutions to intervals on a number line.

ASSESSMENT OF EXPECTED EDUCATION RESULTS

I. COURSE GRADE
The course grade will be determined by the individual instructor using a variety of evaluation methods. A portion of the course grade will be determined through the use of frequent assessment using such means as tests, quizzes, projects, or homework as developed by the instructor. Some of these methods will require the student to demonstrate ability in problem solving and critical thinking as evidenced by explaining and interpreting solutions. A comprehensive final examination is required which must count at least one-fifth and no more than one-third of the course grade.

II. DEPARTMENTAL ASSESSMENT
This course will be assessed every five years. A committee appointed by the Academic Group will grade assessment material.

III. USE OF ASSESSMENT FINDINGS
The Math 1431 Committee, or a special assessment committee appointed by the Academic Group, will analyze the results of the assessment and determine implications for curriculum changes. The committee will prepare a report for the Academic Group summarizing the finding.

EFFECTIVE DATE: March 2008 APPROVED DATE: March 2008