

Fayetteville State University
College of Arts and Sciences
Dr. Henry M. Eldridge Department of Mathematics and Computer Science
STAT 202 Basic Probability and Statistics
Fall 2010

I. Locator Information:

Instructor: Yufang Bao

Course # and Name:

Office Location: **LSB 127**

Semester Credit Hours: **3**

Office hours: M: 8:00am-10:00am (SBE 214)

MWF: 5:00pm-6:00pm, TR: 3:00pm-4:00pm (LSB 127) or by appointment

Day, Time and Room Class Meets

Office Phone: 910-672-2437

Total Contact Hours for Class: **37.5**

Email address: ybao@uncfsu.edu

MathXL (www.mathxl.com) Course ID: **XL0J-C1P8-801Y-1EY2**

FSU Policy on Electronic Mail: Fayetteville State University provides to each student, free of charge, an electronic mail account (username@uncfsu.edu) that is easily accessible via the Internet. The university has established FSU email as the primary mode of correspondence between university officials and enrolled students. Inquiries and requests from students pertaining to academic records, grades, bills, financial aid, and other matters of a confidential nature must be submitted via FSU email. Inquiries or requests from personal email accounts are not assured a response. The university maintains open-use computer laboratories throughout the campus that can be used to access electronic mail.

Rules and regulations governing the use of FSU email may be found at

<http://www.uncfsu.edu/PDFs/EmailPolicyFinal.pdf>

II. Course Description: An introduction to the study of probability and statistical inference. *Prerequisite: MATH 123 or consent of the department.*

III. Disabled Student Services: In accordance with Section 504 of the 1973 Rehabilitation Act and the Americans with Disabilities Act (ACA) of 1990, if you have a disability or think you have a disability to please contact the Center for Personal Development in the Spaulding Building, Room 155 (1st Floor); 910-672-1203.

IV. Textbook: Larson, R. and Farber, B., Elementary Statistics: Picturing the World, 4rd edition, Pearson Prentice Hall. ISBN-10: 0-13-206290-9, ISBN-13: 978-0-13-206290-9 **with**

MathXL Online Course for Elementary Statistics: Picturing the World, 4/E, ISBN-10: 0136030556, ISBN-13: 9780136030553

V. Student Learning Outcomes - Upon completion of this course, students will be able to:

- Understand the basic concepts of probability theory and statistics.
- Calculate elementary probabilities using combinations and permutations.
- Apply the Binomial Theorem.
- Use experimental and theoretical probabilities to formulate and solve applied problems.
- Compute probabilities related to normal random variables.
- Calculate expected values, variances and covariances.
- Construct and interpret statistical graphs and displays.
- Estimate means and proportions and construct confidence intervals.
- Construct and test statistical hypotheses involving problems in social and natural sciences.
- Organize data and make predictions through the use of summary statistics, correlation, regression and curve fitting.

VI. NCDPI and NCATE Standards

Standards Used in this Course	NCDPI Standards for Mathematics Teacher Candidates	NCATE Standard(s)	Assessment(s)
✓	<p>1. Mathematics teacher candidates possess the mathematical knowledge needed to enable students to understand numbers, ways of representing numbers, and relationships among numbers and number systems and to enable students to understand meanings of operations and how they relate to one another. Candidates enable students to develop computational fluency and to make reasonable estimates. At the middle and secondary grade levels, teacher candidates need the mathematical knowledge to enable students to transfer their understanding of numbers and number operations to symbolic expressions involving variables. Number sense, numeration, numerical operation, and algebraic thinking</p>	Content Knowledge	Homework and tests
	<p>2. Mathematics teacher candidates possess the mathematical knowledge needed to enable students to analyze the characteristics and properties of 2- and 3-dimensional geometric shapes; to develop mathematical arguments about geometric relationships; to understand units, processes of measure, and measurable attributes of objects; and to apply appropriate techniques, tools, and formulas to determine measurements. They enable students to develop the visualization, spatial reasoning, and geometric modeling to solve problems. Teacher candidates particularly at middle and secondary grade levels need the mathematical knowledge to enable students to use coordinate geometry in solving problems, to understand concepts of symmetry, and to apply transformations. Spatial sense, measurement and geometry</p>		
✓	<p>3. Mathematics teacher candidates possess the mathematical knowledge needed to enable students to understand patterns, relations, and functions. This includes the use of algebraic symbols to represent and analyze mathematical situations, the use of mathematical models to represent and understand quantitative relationships, and the analysis of “change” in various contexts. Patterns, relationships, and functions</p>	Content Knowledge	Homework, tests, and project
✓	<p>4. Mathematics teacher candidates possess the mathematical knowledge needed to enable students to formulate questions that can be addressed with data, along with the necessary skills to collect, organize, and display relevant data to answer those questions. They enable students to select and use appropriate statistical methods to analyze data, to understand and apply basic concepts of probability, and to develop and evaluate inferences and predictions that are based on data. Data analysis, probability and statistics</p>	Pedagogical Content Knowledge	Homework, tests, and project
✓	<p>5. Mathematics teacher candidates possess the mathematical knowledge needed to enable students to develop skills in problem solving, making connections between various branches of mathematics, reasoning and proof, and</p>	Content Knowledge	Homework, tests, and project

	communication and representation of mathematical ideas. Mathematical process skills		
✓	6. Mathematics teacher candidates must be versed in the appropriate use of mathematical tools and manipulatives. Mathematical tools	Knowledge and Content, Technological Competence, Pedagogical Content Knowledge	Homework, project

VII. Course Requirements and Evaluation Criteria

The following is a list of the assessment tools, and their respective weights, that will be used in determining the course grade.

Homework (32 homework assignments on www.MathXL.com , each with weight of 0.63%)	20%
Tests (4 tests, each with weight of 13.75%)	55%
Project	5%
Final Exam	20%

Final grade will be established on the basis of the grading scale below:

A	90-100%
B	80- 89%
C	70 - 79%
D	60 - 69%
F	Below 60%
FN	Failing due to non-attendance (Student registered, but <u>never</u> attended.)

Please note: If these evaluation criteria must be revised because of extraordinary circumstances, the instructor will distribute a written amendment to the syllabus.

Requirements

1. Pre-requisite: MATH 123.
2. The student is expected to read the topics to be considered in class in advance (see the class outline bellow). The student is expected to complete all assignments and to spend adequate time on class work to insure that the course outcomes are met.
3. It is the responsibility of the student to attend all class meetings, and obtain individual help from the instructor. Student whose class absences exceed 10% of the total contact hours (i.e. 3.75 hours) will be assigned an interim grade "EA".
4. There will be **no makeup tests** unless under extenuating circumstances.
5. The student is expected to submit her/his homework on time. Late homework assignments will not be accepted unless under extenuating circumstances.
6. Students are expected to enter the classroom on time and remain until the class ends. Late arrivals and early departures without appropriate excuses will not be tolerated.
7. Each student is encouraged to participate in class discussions for a clearer understanding and meet with the instructor when additional assistance is needed.
8. All class discussions should be done in a soberly, orderly, and respectful manner.

9. **Dishonesty on graded assignments will not be tolerated.** Students must neither give nor receive help on any work to be graded. The University policy on cheating will be applied to any violations. The **minimum** penalty will be a grade of **zero** on the assignment.
10. No usage of cellular and other electronic devices (except a calculator) is permitted during class!
11. **Withdrawal from Class**
 Withdraw from Class means you are withdrawing from 1 or 2 classes that you will not be attending and you have other classes on your schedule that you will attend. Effective Fall 2009, students will be allowed only 5 withdrawals from class for the remainder of your college career. The 6th W will be calculated as "F" (<http://www.uncfsu.edu/registrar/withdrawals.htm>).

Project

Under the instructor’s direction students are expected to analyze data (collected by the student or retrieved from the internet) using appropriate statistical techniques and report and interpret the results. Time permitting each student will be required to make a short presentation at the end of the semester. Areas of further studies should be incorporated in the report. The *double-spaced* typewritten paper, not exceeding ten (10pages) should include:

- Title Page
- Abstract
- Section 1: Introduction including statement of the problem.
- Section 2: Literature Review
- Section 3: Methodology or Procedure
- Section 4: Data Analysis; Results
- Section 5: Summary; Conclusions; Recommendations; References.

Note: The project outline may be changed for the benefit of the class.

VIII. Academic Support Resources

- **Blackboard System**

<http://blackboard.uncfsu.edu/>

All class documents (syllabus, instructors’ locator card etc.) and resources (slides, worksheets, handouts and reviews for tests) will be posted on the Blackboard system.

- **MathXL**

You can access your course from your MathXL page at <http://www.mathxl.com/>.

Course ID:

Course Name:

Description: **Basic Probability and Statistics**

- **Math Learning Center**

Information is available here

<http://www.uncfsu.edu/learningcenter/math/>

- **Smarthinking**

Information is available here

<http://www.uncfsu.edu/learningcenter/wac/CampusResource.htm>

IX. Course Outline and Assignment Schedule

Week	Date	Section / Topic	Homework due for sections:
1	08.20.2010	1.1 An Overview of Statistics	
2	08.23.2010	1.2 Data Classification	
	08.25.2010	1.3 Experimental Design	
	08.27.2010	2.1 Frequency Distributions and Their Graphs	1.1, 1.2, 1.3
3	08.30.2010	2.2 More Graphs and Displays	
	09.01.2010	2.3 Measures of Central Tendency	
	09.03.2010	2.4 Measures of Variation	
4	09.08.2010	2.5 Measures of Position	
	09.10.2010	Review for Test 1	2.1, 2.2, 2.3, 2.4, 2.5
5	09.13.2010	Test 1	

	09.15.2010	3.1 Basic Concepts of Probability and Counting	
	09.17.2010	3.2 Conditional Probability and the Multiplication Rule	
6	09.20.2010	3.3 The Addition Rule	
	09.22.2010	3.4 Additional Topics in Probability and Counting	
	09.24.2010	4.1 Probability Distributions	3.1, 3.2, 3.3, 3.4
	09.27.2010	4.2 Binomial Distributions	
7	09.29.2010	4.3 More Discrete Probability Distributions	
	10.01.2010	Review for Test 2	4.1, 4.2, 4.3
	10.04.2010	Test 2	
8	10.06.2010	5.1 Introduction to Normal Distributions and the Standard Normal Distribution	
	10.08.2010	5.2 Normal Distributions: Finding Probabilities	
9	10.11.2010	5.3 Normal Distributions: Finding Values	
	10.13.2010	5.4 Sampling Distributions and the Central Limit Theorem	
10	10.20.2010	5.5 Normal Approximations to Binomial Distributions	
	10.22.2010	6.1 Confidence Intervals for the Mean (Large Samples)	5.1, 5.2, 5.3, 5.4, 5.5
11	25.10.2010	6.2 Confidence Intervals for the Mean (Small Samples)	
	10.27.2010	6.3 Confidence Intervals for Population Proportions	
	10.29.2010	Review for Test 3	6.1, 6.2, 6.3
12	11.01.2010	Test 3	
	11.03.2010	7.1 Introduction to Hypothesis Testing (I)	
	11.05.2010	7.1 Introduction to Hypothesis Testing (II)	
13	11.08.2010	7.2 Hypothesis Testing for the Mean (Large Samples)	
	11.10.2010	7.3 Hypothesis Testing for the Mean (Small Samples)	
	11.12.2010	7.4 Hypothesis Testing for Proportions.	
14	11.05.2010	10.1 Goodness of Fit	7.1, 7.2, 7.3, 7.4
	11.17.2010	10.2 Independence	
	11.19.2010	Review for Test 4	
15	11.22.2010	Test 4	10.1, 10. 2
	11.24.2010	9.1 Correlation	
16	11.29.2010	9.2 Linear Regression	
	12.01.2010	9.3 Measures of Regression and Prediction Intervals	
	12.03.2010	Review for the final exam	9.1, 9.2, 9.3
17	TBA	Final Exam	

Note: This schedule is tentative! It might be changed for the benefit of the class.

Note: In case FSU must close for an emergency during the semester, instruction will continue using Blackboard.

X. Teaching Strategies

Stat 202 is a lecture-based course designed to present the basic theories of probability and statistics. Each lecture will contain a summary of the most important concepts from each chapter section. The graphics calculator and/or computer will be utilized to bring clarity and understanding to each concept or theory discussed. Questions will be posed to class to measure comprehension. Therefore, there will be lectures, class discussions, student presentations and cooperative group learning activities.

XI. Bibliography

Bluman, Allen G. (2004) Elementary Statistics: A Step – by – Step Approach McGraw Hill Fifth Edition
Clarke G. M., and Cooke, D., A Basic Course in STATISTICS (4th Edition), Oxford University Press, New York, NY 1998
Larson, Richard J., Marx, Morris L., and Cooil Bruce, STATISTICS for Applied Problem Solving and Decision Making, Duxbury Press, Pacific Grove, CA 1997
Yates Daniel, Moore David, and McCabe George, The Practice of Statistics, W. H. Freeman and Company, New York, NY 2000
Larson, Richard J., Marx, Morris L., and Cooil Bruce (1997) STATISTICS for Applied Problem Solving and Decision Making, Duxbury Press, Pacific Grove, CA 1997
McClare, Jim, First Course in Statistics, Prentice Hall 2000

Appendix 1: STAT 202 PROJECTS

Students are expected to work on two small projects for this class. Students are encouraged to seek writing help from SmartThink.com and our university writing Lab located at H.T.Chick 216A. Criteria for grading both projects are provided in the Appendix Section.

1. CLA Performance Task (3 pts):

A set of documents will be provided and students will be required to write their opinions in one short paragraph (use 100-200 words) in response to the question asked.

2. Data Analysis and report (7 pts)

The instructor will direct students; however, students are expected to collect and analyze data using appropriate statistical techniques and interpret the results. Each student will be required to write a project report on their own topics. Each Student will need to make a presentation at the end of the semester if time allowed. Areas of further studies should be incorporated in the report.

Report Format

In general APA format is preferred for the report. It should be *double-spaced* and typewritten, not exceeding ten (10pages), should include:

Title Page: Title, Author, and institution/department (all centered in middle of page).

Abstract Page: 50-150 words.

Body of the paper: The following Chapters should be incorporated

Chapter I: Statement of the Problem; Introduction

You need to clearly answer "what is the topic I am interested" and "why is this topic worth my attention"? This should explain why the data set is selected.

Chapter II: Literature Review

The focus of a literature review is to summarize and synthesize the arguments and ideas of others. (http://www.unc.edu/depts/wcweb/handouts/literature_review.html)

Chapter III: Methodology or Procedure

You need to explain in paragraphs about how and when the data set was collected, and who collected the data. Please incorporate requirements 1-3 in the Report content.

Chapter IV: Data Analysis; Results

Please use graphs, tables and dataset itself to present the result of your analysis of the dataset. Please incorporate requirements 4-7 in the Report content.

Chapter V: Summary; Conclusions; Recommendations.

Please provide in this chapter your interpretation of your results and what information has been gained from this study. You can also explain here reasons of unexpected findings, report problems that may have affected the results and your suggestions for future studies.

References: should be provided at the end of the paper.

Report Submission

1. The final report should be submitted electronically through www.blackboard.uncfsu.edu with a due date of Nov. 10, 2010. Students are allowed to revise their report on or before Dec. 1, 2010 if you want to.

Note that each submission due date will be recorded. 5% points will be reduced from each late assignment.

No extension for the final project due date of Dec. 1, 2010.

THIS OUTLINE MAY BE CHANGED FOR THE BENEFIT OF THE CLASS.

Appendix 2. Rubric for CLA Performance Task

Your writing will be evaluated using the criteria provided together with the assignment in addition to skills of writing and grammar. Your efforts for improving your writing will be considered as well.

	Excellent	Good	Average	Needs Work	Points Possible
Your writing should support your claims by using evidence from the supporting documents provided.					
You need to develop your explanation by showing how the evidence supports your claims.					

Appendix 2. Rubric for Data Analysis Project

Criteria	Excellent	Good	Average	Needs Work	Points Possible
Analyze your dataset using the knowledge you have learned from this course. All questions under <u>Report Content</u> (P8-9) needed to be shown in the paragraphs of your report. Tables, graphs, data should be used for your report.					50
Overall organization follows clear, logical order with paragraphs connect to each other clearly with transitional expression					15
Each Chapter need to be developed to show the reasoning of your interest in the dataset that you selected					20
APA format should be used. Headings, title page, abstract page need to follow the <u>Report Format</u> (P9) requirement					10
References are cleared					5