

Fayetteville State University
College of Basic and Applied Sciences
Department of Mathematics and Computer Science
STAT 302-01 Mathematical Statistics
Spring 2012

I. Locator Information:

Instructor: **Dr. Yufang Bao**

Course # and Name: **STAT 302-01 Mathematical Statistics**

Semester Credit Hours: **3**

Office Location: **LSB 127**

Office Hours:

**Other Hours by Appointment*

Day, Time and Room Class Meets:

Total Contact Hours for Class: **37.5**

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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: A study of probability distributions of random samples, the theory of point and interval estimation, hypothesis testing, and decision theory concepts. *Prerequisite: STAT 301.*

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: John Hogg, R.V., & Tanis, E.A., Probability and Statistical Inference, 8th edition, Prentice Hall, 2010.
SOCR: Statistics Online Computational Resource tools, <http://www.socr.ucla.edu/>

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

- Understand the sampling distribution theory.
- Be able to apply the central Limit Theorem.
- Have knowledge of the basic ideas of point and interval estimation.
- Use experimental and theoretical probabilities as appropriate for the formulation and solving of a class of problems.
- Be able to analyze data and make predictions through the use of such statistical techniques as tests of hypotheses, correlation, and regression.
- Be able to solve applied statistical problems.
- Be able to communicate, verbally or in writing, mathematical ideas in appropriate style and format.

VI. 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 (5 highest homework scores out of 6 homework assignments, each with weight of 6%) _____ **30%**
Tests (3 highest test scores out of 4 tests, each with weight of 23.3%) _____ **70%**

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.).

Some homework assignments will involve performing probability experiments and statistical analyses and reporting their results using SOCR: Statistics Online Computational Resource tools, <http://www.socr.ucla.edu/>

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: STAT 301.
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. At least two hours of home study is expected for each class hour.
3. It is the responsibility of the student to avail himself/herself at 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 = 3 classes) will be assigned an interim grade "EA".
4. Since the lowest test will be dropped there will be no **makeup tests** unless under extenuating circumstances. **In case of such excused absences student should contact the instructor prior to the test!**
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.uncf.edu/registrar/withdrawals.htm>)

VII. Academic Support Resources

- **Blackboard System**

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

All class documents (syllabus, instructors' locator card etc.); resources (slides, lecture notes, handouts and reviews for tests) and homework will also be posted on the Blackboard system.

- **Smarthinking**

Information is available here

<http://www.uncfsu.edu/fsuretention/Smarthinkingresources.htm>

VIII. Course Outline and Assignment Schedule

Week	Date	Section / Topic	Assignment due
1	01.10.12	Review of Probability Theory	
	01.12.12	3.6 The Normal Distribution (Review)	
	01.17.12	4.4 The Bivariate Normal Distributions (Review) 5.2 Transformations of Two Random Variables	
2	01.19.12	5.3 Several Independent Random Variables	
	01.21.12	5.4 The moment-generating function technique 5.5 Random Functions Associated with Normal Distributions	
	01.24.12	Review of Probability Theory	
3	01.26.12	5.6 The Central Limit Theorem	Homework 1
	01.28.12	5.7 Approximations for Discrete Distributions	
	01.31.12		
4	02.02.12	Review	Homework 2
	02.04.12	Test 1 (02.02.12)	
	02.07.12	6.1 Point Estimation (I)	
5	02.09.12	6.1 Point Estimation (II)	
	02.12.12		
	02.14.12		
6	02.16.12	6.2 Confidence Intervals for Means (I)	
	02.18.12		
	02.18.12	6.3 Confidence Intervals for Two Means (I)	
7	02.21.12		
	02.23.12	6.3 Confidence Intervals for Two Means (II)	
	02.25.12		
8	02.28.12	6.5 Confidence Intervals for Proportions	
	03.02.12	Review	Homework 3
	03.04.12	Test 2 (03.04.12)	
9	03.14.12	6.7 A Simple Regression Problem	
	03.16.12		
	03.18.12	6.8 More Regression	
10	03.21.12	6.8 More Regression	
	03.23.12		
	03.25.12	7.1 Tests about Proportions	
11	03.28.12		Homework 4
	03.30.12	7.2 Tests about One Mean and One Variance	
	04.01.12	7.4 Tests about One Mean and One Variance (II)	

12	04.04.12	7.3 Test of the Equality of Two Normal Distributions Review Test 3 (04.08.12)	
	04.06.12		
	04.08.12		
13	04.12.12	8.1 Chi-Square Goodness of Fit Tests	Homework 5
	04.13.12		
	04.15.12		
14	04.18.12	8.2 Contingency Tables	
	04.20.12		
	04.22.12	10.1 Power of Statistical Tests	
15	04.25.12	Review Test 4 (04.29.12)	
	04.27.12		Homework 6
	04.29.12		
16	05.02.12	Final Exam Week Meeting: Discussion of selected topics.	

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.

IX. Teaching Strategies Stat 302 is a lecture-based course designed to present the basic ideas of mathematical statistics. Each lecture will contain a summary of the most important concepts from each chapter. The graphics calculator and/or computer (SOCR: Statistic Computational Resource Online) 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.

X. Bibliography

DeGroot, M. H., and Schervish, M.J. Probability and Statistics, 3ed, Boston, Adison & Wesley 2002
Dudewicz, J. E., and Mishra, S. N., Modern Mathematical Statistics, New York, John Wiley 1988
Feller, W., Vols. I and II, Introduction to Probability Theory and Applications, New York,, John Wiley 1971
Hoel, Paul G., Port, Sidney C., and Stone, Charles J., Introduction to Probability Theory, Boston, Houghton Mifflin 1971
Hogg, R.V. & Tanis, E.A., Probability and Statistical Inference, 7th, Prentice Hall, New York 2006
Kreyszig Erwin, Advanced Engineering Mathematics, New York, John Wiley 1993
Larsen, R. J., and Marx, M.L., An Introduction to Mathematical Statistics and Its Applications, 3ed, Upper Saddle River, NJ, Prentice Hall 2001
Mendenhall, W, Schemer, R. L, & Wickedly, D. D. Mathematical Statistics with Applications, Boston, Duxbury 1988
Mood, A. M., Graybill, F. A., and Boes, D. C., Introduction to the Theory of Statistics, New York, McGraw-Hill 1974
Ramachandran, K.M., Tsokos, C. P., Mathematical Statistics with Applications, Academic Press, 2009
Rice, J. A., Mathematical Statistics and Data Analysis, 3 ed, Duxbury, 2007