

**STA 4321/5325 – Introduction to Probability**  
**Section 5516 (4321)**  
**MWF Period 4, FLO 100**  
**Fall 2015**

Instructor: Dr. Larry Winner

e-mail: winner@stat.ufl.edu

Office: 228 Griffin/Floyd

Office Hours: (See Class Website for Update)

TA: (See Class Website for Update)

Textbook: Mathematical Statistics With Applications, 7th Ed, (2008). Wackerly, Mendenhall, and Scheaffer, Brooks/Cole.

Course Description: This course is a calculus based introduction to probability theory. General topics include:

- Basic Probability (Chapter 2)
  - Introduction (2.1)
  - Probability and Inference (2.2)
  - Set Notation (2.3)
  - Probability: Discrete Case (2.4)
  - Probability: Sample-Point Method (2.5)
  - Counting Rules (2.6)
  - Conditional Probability/Independence (2.7)
  - Probability Rules (2.8)
  - Probability: Event-Composition Method (2.9)
  - Law of total Probability and Bayes' Rule (2.10)
  - Numerical Events and random Variables (2.11)
  - Random Sampling (2.12)
- Discrete Probability Distributions (Chapter 3)
  - Discrete Random Variables/Probability Distributions (3.1-3.2)
  - Expected Values (3.3)
  - Families of Discrete Distributions
    - Bernoulli and Binomial (3.4)
    - Geometric (3.5)
    - Negative Binomial (3.6)
    - Hypergeometric (3.7)
    - Poisson (3.8)
  - Moment-Generating Function (3.9)
  - Probability-Generating Function (3.10)
  - Tchebysheff's Theorem (3.11)
  - Simulation
- Continuous Probability Distributions (Chapter 4)
  - Continuous RVs/Probability Distributions (4.1-4.2)

- Expected Values (4.3)
- Families of Continuous Distributions
  - Uniform (4.4)
  - Normal (4.5)
  - Gamma (4.6)
  - Beta (4.7)
- Moment-Generating Functions (4.9)
- Tchebysheff's Theorem (4.10)
- Mixed Probability Distributions (4.12)
- Simulation
- Multivariate Probability Distributions (Chapter 5)
  - Bivariate & Marginal Distributions (5.1-5.2)
  - Marginal and Conditional Distributions (5.3)
  - Independent Random Variables (5.4)
  - Expected Values of Functions of RVs (5.5)
  - Special Theorems (5.6)
  - Covariance (5.7)
  - Expected Value and Variance of Linear Functions of RVs (5.8)
  - Multinomial Distribution (5.9)
  - Bivariate Normal Distribution (5.10)
  - Conditional Expectations (5.11)
- Functions of Random Variables (Chapter 6)
  - Probability Distribution of Functions of RVs (6.1-6.2)
  - Method of Distribution Functions (6.3)
  - Method of Transformations (6.4)
  - Method of Moment-Generating Functions (6.5)
  - Multivariable Transformations Using Jacobians (6.6)
  - Order Statistics (6.7)
- Limit Theorems (Chapter 7)
  - Convergence in Probability (7.2)
  - Weak Law of Large Numbers (7.2)
  - Convergence in Distribution (7.3)
  - The Central Limit Theorem (7.4)

Grading: *4 In-Class Midterm exams and 2 Projects (5% Each)*

- *Exam 1: Friday, September 18 (22.25%)*
- *Exam 2: Friday, October 9 (22.25%)*
- *Exam 3: Wednesday, November 4 (22.25%)*
- *Exam 4: Monday, December 7 (22.25%)*

Course Policies (Read Carefully):

- All exams are closed book/closed notes. You will need a calculator.
- Problems will be assigned from each. These will be representative of exam problems and will help you prepare for exams.
- Examples covered in class are also likely to appear on exams. It is your responsibility to keep up with all material, or you will find exams very difficult.

- This course makes use of all Pre- and co-requisites, be prepared to use calculus (especially Chapters 4-6)
- No Make-up exams will be given with the exception of medical emergencies or academic reasons.
- Lectures are the time to ask questions. No questions regarding content will be answered during exams.

Practice Problems:

Section: Problems

Chapter 1

1.2: 3,5,7

1.3: 9,11,12,19,21

Supplementary Exercises: 22,23,24,27,29,31,33,36

Chapter 2

2.3: 1,2,3,4,5,6,7,8

2.4: 9,10,11,13,14,15,17,19,21,22,23,24

2.5: 26,28,29,30,31,33

2.6: 35,36,37,38,39,40,41,43,45,46,50,53,55,57,61,68,69\*

2.7: 71,72,73,75,77,79,81,82,83

2.8: 85,86,89,90,92,95,97,98,104,105

2.9: 111,112,113,115,117,120,121

2.10: 125,129,133,135

2.11: 139,140,141

Supplementary Exercises: Read as many as possible, and confirm you know how to set the problem up.

Chapter 3

3.2: 1,3,4,5,9,10,11

3.3: 12,14,15,16,19,20,21,23,24,27,30,31,33,34

3.4: 35,37,38,39,41,43,44,45,48,51,53,55,56,57,59,62

3.5: 67,68,70,71,73,74,83,84

3.7: 103,104,105,106,109,113,114

3.8: 121,122,123,125,126,127,131,134,137,138,139,142,143,144

3.9: 145-155,158,159,161

3.11: 167,168,169ab,177

3.13: 95,97,98,102,103,106,109,112,113,116,117,119,120,122,124

Supplementary Exercises: Read as many as possible, and confirm you know how to set the problem up.

Chapter 4

4.2: 1,3,5,6,8,9,11-17,19

4.3: 20-31,33

4.4: 38-44,49,51,52,57

4.5: 58a-e,59,60,61,62,66a,67,68a,69,70,73,75,77,80

4.6: 81,82,88-92,103,104,105a,106a,107a,109-112

4.7: 123a,124a,125-130,133a-c

4.9: 136-140,143,144

4.10: 146-152

Supplementary Exercises: Read as many as possible, and confirm you know how to set the problem up.

## Chapter 5

5.2: 1,2,4,5,6-10,12-15,17,18

5.3: 19,20,22,23,24,25,27,28,30,31,32,33,34,35,37,39\*,42\*,

5.4: 43,45,46,48,49,50,51,53,56,57,59,61,63,65\*,68,69,71

5.6: 72,74,75,76,77,78,81,83,85\*\*,87 \*\*e makes use of next section

5.7: 89,91,92,94,95,96,97,99,100,101\*

5.8: 102,103,105-108,110-114,116,118

5.9: 119,120,122-125

5.11: 133,134,136,138,139,140,142

Supplementary Exercises: Read as many as possible, and confirm you know how to set the problem up.

## Chapter 6

6.3: 1-8,10,11,12,15,17

6.4: 23-28,31-35

6.5: 37-43,46,47,49-52,53,55,57,59

6.6: 63,64

6.7: 72-75,80-83,87,88

Supplementary Exercises: Read as many as possible, and confirm you know how to set the problem up.

### Course Grade Cut-offs:

A	A-	B+	B	B-	C+	C	C-	D	E
90	87.5	85	80	75	70	65	60	50	

**Attendance/Exam/Assignment Policies:** While attendance is not taken, students are expected to attend lectures and participate in class. Make-up exams will only be considered with documented medical event or conference attendance (graduate students). Early exams will be given under no circumstances. Assignments are to be handed in during class on the date the assignment is due in paper format. Electronic submission of assignments will not be accepted. Turn off cell phones during classes.

**Academic Accommodations:** If you have a documented disability and wish to discuss academic accommodations with me, please contact me as soon as possible.

### University Grading Points:

A	A-	B+	B	B-	C+	C	C-	D	E
4	3.67	3.33	3	2.67	2.33	2	1.67	1	0

**Online Course Evaluations:** The University has an online course evaluation system. Late in each semester (after final withdrawal date), students can go to the GATORRATER portal and evaluate courses. The website is located at: <https://evaluations.ufl.edu/evals/Default.aspx>.

## **University Policies:**

**Academic Dishonesty:** All members of the University Community share the responsibility to challenge and make known acts of apparent academic dishonesty. Acts of academic dishonesty will not be tolerated and will be referred to the Student Honor Council.

**Incomplete:** An incomplete grade may be assigned at the discretion of the instructor as an interim grade for a course in which the student has completed a major portion of the course with a passing grade, been unable to complete course requirements before the end of the term because of extenuating circumstances, and obtained agreement from the instructor and arranged for resolution of the incomplete grade in the next term. Instructors are not required to assign incomplete grades. For complete details please visit: [CLAS incomplete grade policies and forms.](#)

## **Campus Resources:**

Counseling and Wellness Center: <http://www.counseling.ufl.edu/cwc/>

Academic Resources: <http://www.ufl.edu/academics/resources/>

Disability Resource Center: <https://www.dso.ufl.edu/drc/>

Student Health Care Center: <http://shcc.ufl.edu/>