University of International Business and Economics
International Summer School

STAT 205 Probability Theory

Term: May 28 – June 28, 2018
Instructor: Colin McLarty
Home Institution: Case Western Reserve University
Email: colin.mclarty@case.edu
Class Hours: Monday through Thursday, 120 minutes each day
Office Hours: TBD
Discussion Session: 2 hours each week

Total Contact Hours: 66 contact hours (45 minutes each)
Credit: 4 units

Course Description:
Introducing probability and statistical inference. The course has a prerequisite of differential and integral calculus.

Course Goals:
A student who satisfactorily completes this course will be able to:

- ✧ understand the basic rules of probability conditional probability. and expectation
- ✧ apply Bayes' theorem on changing conditional probabilities with new evidence;
- ✧ understand the difference between discrete and continuous random variables;
- ✧ work easily with several common distributions, discrete and continuous;
- ✧ understand the central limit theorem;
- ✧ understand the difference between point estimates and inference by confidence intervals, the strengths and limits of both;
- ✧ engage in critical evaluation of statistical evidence, and experimental design.

Required Textbook:
Probability & Statistics for Engineering and the Sciences, 8th edition, by Thomson Devore, Cengage Learning. ISBN-10: 8131518396,ISBN-13: 978-8131518397.

Grading Policy:
Grading will be determined by a combination of class attendance and participation, and the results of your exams.

Attendance and Participation	20%.
In class short quizzes	30% total.
Midterm Exam	20%.
Final Exam	30%.

Grading Scale:
Assignments and examinations will be graded according to the following grade scale:

A	90-100	**C+**	72-74
A-	85-89	**C**	68-71
B+	82-84	**C-**	64-67
B	78-81	**D**	60-63
B-	75-77	**F**	below 60

Class Rules:
Students are expected to come to lecture having read the material assigned for the day, and prepared to engage in active discussion about those ideas.

Attendance Policy:
Summer school is very intense and to be successful, students need to attend every class. Occasionally, due to illness or other unavoidable circumstance, a student may need to miss a class. UIBE policy requires a medical certificate to be excused. Any unexcused absence may affect the student's grade. Moreover, UIBE policy is that a student who has more than 1/3 (6 times) of the class in unexcused absences will fail the course.

Course Schedule:

Week One.
Monday: Chapter One, overview
Tuesday: Chapter Two, sample spaces and events, basic probability.
Wednesday. Chapter Two, conditional probability. independence, and Bayes' theorem.
Thursday. Chapter Three, introducing discrete random variables. **Quiz 10%**.

Week Two.
Monday, Chapter Three, several discrete probability distributions (binomial, hypergeometric, negative binomial, Poisson).
Tuesday. Chapter Four, continuous random variables. Probability density.
Wednesday. Several continuous probability distributions (normal, exponential, gamma).
Thursday. **Midterm Examination 20%**.

Week Three:
Monday. Chapter Five, jointly distributed random variables, expected values, correlation.
Tuesday. Chapter Five, Distribution of sample means. Distribution and linear correlation.
Wednesday. Chapter Six, point estimation.
Thursday, point estimation. **Quiz 10%**.

Week Four:
Monday and Tuesday, Chapter Seven, confidence intervals for mean and proportion for a normal population distribution.
Tuesday and Wednesday. Confidence intervals for variance of a normal population distribution.
Thursday, review, and **quiz 10%**.

Week Five:
Monday and Tuesday, hypothesis testing on a single sample. t-test.
Wednesday, review.
Thursday, **final, 30%**.