Instructor: Hokwon A. Cho, Ph.D., Associate Professor, Office: CDC Bldg. 10 Room #1008.
E-mail: cho@unlv.nevada.edu, Phone: 895-0393.

Class Time and Location: Tue., & Thu., 10:00AM-11:15AM, CBC C-317.

Office Hours: Mon., Wed., & Thu., 1:30PM-3:00PM or by appointment.


Pre-requisite: STAT 411 or equivalent courses or instructor's consent.

Scope of Course: This course is the first part in a two-semester sequence on probability and statistics in upper division/senior level. It aims to introduce mathematical foundations and infrastructures in statistics at the intermediate level. Thus, mathematical concepts and methods, statistical rationale and derivations will be explored focusing on the probability and introductory level of measure theory. In chronological order, the topics to be covered are:

1. **Probability Theory**: Set theory, limit of a sequence of sets, sample space and events, independence, probability inequalities, basic topology, random variables (RV).

2. **Discrete random variables and their probability distributions**: Expected value of RV, Binomial, Geometric, Negative Binomial, Hypergeometric, Poisson, generating functions and Moment generating function (MGFs), Tchebysheff’s theorem.

3. **Continuous random variables and their probability distributions**: Uniform, Normal, Gamma, exponential, Beta probability distribution, MGFs, Tchebysheff’s theorem.

4. **Multivariate Probability Distributions**: Random vector, bivariate distribution, covariance, correlation, independence, bivariate normal distribution, and conditional expectation.

5. **Functions of Random Variables**: Method of distribution functions, method of transformations, MGF method, multivariable transformation, and order statistics.

6. **Sampling Distribution and the Central Limit Theorem**: Random sample, sampling theory, Normal distribution, Central Limit Theorem, application of normal approximation. (If time permits.)

Homework: All homework assignments will be given in class and expected to turn in on time. No late homework will be accepted. Some of the problems will be discussed in class. Graduate (including postbaccalaureate) students will be assigned additional/extra problems on each assignment and mandatory to complete, which are optional for the undergraduates for extra credit.

Exams: Two midterm tests will be most likely on 5th/6th and 10th/11th week and a final exam will be given according to the university schedule; Tue., Dec. 10, 10:10AM-12:10PM. Note that graduate (including postbaccalaureate) students will be given partially additional/extra or different problems/questions on each exam, which are not required to the undergraduates.

Grading: The course grade is based upon the following: (1) homework assignments = 15% (2) two mid-semester exams = 25% each, and (3) a final exam = 35%. Grade Scale: A-A−: 85% or above, B+:B: 75% or above, C+:C: 65% or above, D+:D: 55% or above, F: Below 55%.

Notes: (1) The above schedule or contents may be changed without notice. (2) Make-up examinations will be given only under unusual circumstances and only if prior arrangements have been made by the instructor. (3) Frequent absences (e.g., more than 20% of classes) may not be eligible to get credit from this course.
**Electronic Devices:** Cell phones and other electronic devices are not permitted except for class work. Those devices should be turned off or silenced and put away during class.

**University Policies:** For the university class policies on the Academic Misconduct, Copyright, Disability Resources Center (DRC), Tutoring, Writing Center, and Religious Holidays, refer the following links.

- Academic Misconduct: [http://studentlife.unlv.edu/judicial/misconductPolicy.html](http://studentlife.unlv.edu/judicial/misconductPolicy.html)
- Copyright: [http://www.unlv.edu/committees/copyright/](http://www.unlv.edu/committees/copyright/)
- Disability Resources Center (SSC Rm137): [http://studentlife.unlv.edu/disability/](http://studentlife.unlv.edu/disability/)
- Tutoring, Academic Success Center (ASC): [http://academicsuccess.unlv.edu/tutoring/](http://academicsuccess.unlv.edu/tutoring/)
- University writing Center (CDC-3 Rm 301): [http://writingcenter.unlv.edu/](http://writingcenter.unlv.edu/)