| **STA4322** | **Introduction to Statistics Theory** | **Fall 2023** |
| **STA5328** | **Fundamentals of Statistical Theory** | |

Instructor: Bikram Karmakar (`bkarmakar@ufl.edu`)

Class hours: Tuesday - Period 2-3 (8:30 am–10:25 am), Thursday - Period 3 (9:35 am–10:25 am)

Class room: Tuesday - Rinker Hall (RNK) 0110 and Thursday - Little Hall (LIT) 0113.

Course website: Canvas page. Please check regularly.

Instructor's office: 226 Griffin-Floyd Hall. (Phone. 352-273-2994)

Office Hours (via Zoom): Fridays 3:00 pm–5:00 pm, or by appointment via email.

Teaching Assistant: TBD

   Office Hours: TBD

Classroom location: Anderson Hall (AND) 0034

Note: Tentatively, lectures on Sep 12 and Oct 24 will be delivered over Zoom.

Objectives:

The sequence of courses STA 4321-4322 (rep. 5325-5328) provides a formal and systematic introduction to mathematical statistics for students who have passed three semesters of standard undergraduate level calculus. Major topics of STA 4322/5328 include normal-theory sampling distributions, fundamentals of statistical inference, point estimation, method of moments, confidence intervals, the likelihood function, sufficiency, the Factorization Theorem, the Rao-Blackwell Theorem, maximum likelihood estimation, hypothesis testing, Neyman-Pearson Lemma, duality between tests and confidence regions, and linear models. The primary purpose of STA 4322/5328 is preparation for graduate-level study in statistics and related fields, or for research in the sciences, social sciences or medical sciences of the type where advanced statistical methods are used. This is fundamentally a theory course, not a course in applied statistics.

Prerequisite: STA 4321 or STA 5325. (If you have questions, consult with the instructor)

Course materials

Textbook: *Mathematical Statistics with Applications*, 7th Edition by Dennis D. Wackerly, William Mendenhall III, & Richard L. Scheaffer. The book is recommended but is not required.

Lecture notes: Lecture notes will be posted on Canvas after each lecture. They are not meant to replace the lectures. You are responsible for learning all material presented during the lecture, and *any topic covered in a lecture is a potential exam topic* (unless otherwise stated). Lecture notes may not reproduce everything covered in the lectures. On some occasions, there may be some additional information in the lecture notes beyond the lectures.

Additional materials may be posted on Canvas and you will be notified of them using Canvas announcements. We will be using Canvas announcements as a primary mode of communication outside of lectures. Please make sure you get alerts on all Canvas announcements.

Course structure

Homework: Appropriate readings and exercises will be posted as the course progresses. You are not expected to submit your answers to the exercises, but you should solve or attempt to solve all of them to thoroughly learn the material and *best prepare yourself for exams.* Though you are allowed to work with other students to solve the suggested problems and to learn course material in general, please keep in mind that you will be assessed individually. We will post solutions to all the exercises. Naturally, you will learn best if you attempt to solve the exercises before consulting the solutions.

Quizzes: There will be approximately 4 in-class quizzes, typically scheduled for Fridays. Each will take place during the final 5 to 10 minutes of class time. All quizzes have equal weight for grading, but 1 of your quizzes will be dropped – whichever the rest gives you the highest final score in the course, as determined by the instructor. No make-up quizzes will be offered. You will be notified of an upcoming quiz at least one week in advance.

Exams: Three within-term exams are tentatively scheduled:

Thursday, Sep 28– Exam 1

Thursday, Nov 2 – Exam 2

Tuesday, Dec 5 – Exam 3

The highest of the first 2 within-term exams will be counted as double (for example if you get 44 out of 50 in one of them and 50 out of 50 in the other one, your score in the first two exams will be $(44 + 2 \times 50)$ out of 150, i.e., 96%.

Attendance: Classroom lecture attendance and participation is fully expected. You are responsible for learning all material presented during lecture, and any topic covered in lecture is a potential exam topic (unless otherwise stated).

Grading: Grading will be based on a composite score: 5% class participation + 30% quizzes + 40% from within-term exams 1–2 (double the highest score+the second highest) + 25% within-term exam 3. There may be opportunities for earning extra credits.

Final letter grades will be assigned on the University's grading scale that includes minus-grades (this may change depending on any changes in policies). You can familiarize yourself with the University's grading policy here: https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx.

Tentatively, we will follow the following percent to letter grading scale: $A = 95$–100 or above, $A- = 90$–94, $B+ = 85$–89, $B = 80$–84, $B- = 75$–79, $C+ = 70$–74, $C = 60$–69, $C- = 50$–59, and so on. The lower limits on this grading scale may be lowered. The calculation of your final composite score will be done outside of Canvas using the details provided above. Please note that the formula used by Canvas will not necessarily produce the final average according to the course grading scheme.

Course Policies

Students with disabilities requesting accommodations should first register with the Disability Resource Center (352-392-8565, `dso.ufl.edu/drc`) by providing appropriate documentation. Once registered, students will receive an accommodation letter which must be presented to the instructor when requesting accommodation. Students with disabilities should follow this procedure as early as possible in the semester.

Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with university policies that can be found at: catalog.ufl.edu/UGRD/academic-regulations/attendance-policies/

Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Relevant links: gatorevals.aa.ufl.edu/students/; ufl.bluera.com/ufl/; gatorevals.aa.ufl.edu/public-results/.

https://policy.ufl.edu/policy/masking-and-physical-distancing/

Our class sessions may be audio visually recorded for students in the class to refer back and for enrolled students who are unable to attend live. Students who participate with their camera engaged or utilize a profile image are agreeing to have their video or image recorded. If you are unwilling to consent to have your profile or video image recorded, be sure to keep your camera off and do not use a profile image. Likewise, students who un-mute during class and participate orally are agreeing to have their voices recorded. If you are not willing to consent to have your voice recorded during class, you will need to keep your mute button activated and communicate exclusively using the "chat" feature, which allows students to type questions and comments live. The chat will not be recorded or shared. As in all courses, unauthorized recording and unauthorized sharing of recorded materials is prohibited.