Department of Mathematics

College of Science

University of Salahaddin-Erbil

Subject: Mathematical Statistics

Course Book: Third Year Class

Lecturer: Khwazbeen Saida Fatah

Academic Year

2023-2024/ First Semester

Course Book

1. Course name	Mathematical Statistics
2. Lecturer in charge	Khwazbeen Saida Fatah
3. Department/ College	Mathematics / Science
4. Contact	*Khwazbeen.fatah@su.edu.krd* khwazbeen@yahoo.com *Tel: 07503018989*
5. Time (in hours) per week	Theory: 2
6. Office hours	**Monday** 08:30 – 10:30;
7. Course code	
8. Teacher's academic profile	**Khwazbeen Saida Fatah, PhD in Applied Statistics** **Assistant Professor, Mathematics Department** **College of Science, Salahaddin University** **Emal: khwazbeen.fatah@su.edu.krd** ***Qualifications*:** • PhD in Applied Statistics (2009), University of Glamorgann, UK • MSc in Simulation (1985), University of Wales, U.K • BSc in Mathematics (1979) University of Sulaimani, Iraq. ***Teaching Experience*:** From 1986 worked as an assistant lecturer, a lecturer and then as assistant professor at Mathematics Department/ College of Science/ Salahaddin University/Iraq teaching at different levels/undergraduate and post graduate, supervising MSc and PhD projects. ***Other Employments*** • Director for Computer & Internet Center, Salahaddin University (1997-2004) • Computer Supervisor for Central Bureau for Admissio Salahaddin University (1998-2002) • Internet Supervisor for Safeen Center for Internation communications (1996-1998) • Internet Supervisor for Kurdistan National Assembly in Erbil (1998-2000). ***Languages:*** • English • Arabic • Kurdish ***Publications***: Published papers mostly in applied statistics and 4 published book

9. Keywords	Limiting Distribution; Sampling; Central Limit Theorem; Estimation; Estimation Methods; Properties for good estimator; Testing Hypothesis

10. Course overview: This semester for Mathematical Statistics course is designed as one of the main core courses for third year undergraduate students with prior knowledge of basic statistics (Descriptive Statistics) and probability theory. It is continuation for the previous semester and previous year course. starting with the main concepts limiting distribution and then the rest of the course will be devoted to introduce students to elements of statistical inference; sampling theory and estimation; estimation methods with testing hypothesis. Finally, giving examples that help students understand the role of statistical inference in solving real life problems.

11. Course objective: To provide students with a solid grounding in probability theory and mathematical statistics of statistical inference. The student is introduced to sampling theory and estimation with methods of estimation to identify efficient estimators.

12. Student's Obligation**:** Students should attend lectures. There will be one examination and a comprehensive final examination. Announced and unannounced quizzes may be given. Various homework exercises (assignments), which are used in grading, are given weekly.

13. Forms of teaching: For this course, different forms of teaching methods such as the lecture method, multimedia presentations, group discussions, and spreadsheet assignments will be used throughout the course. Work will be done individually and/or in small groups. The primary focus of the teaching methodologies used will be to introduce students to main concepts of statistical inference, which will help them apply the statistical tools learned to real life situations. Thus enough time will be devoted to interactive learning and problem solving. The readings will come from the required text books as well as additional references such as internet resources and other to be provided by the instructor. Lectures and tutorials will enable the instructor and students to expand on the material presented in the readings.

14. Assessment Scheme**:** For this course different assessment measures are considered such as quizzes, graded homework and exams, building up to a comprehensive final exam. The final grade is calculated as follows: Exams: 30% , Homework and interactive activities: 10% , Final Exam: 60%.

15. Student learning outcome: As a result of successfully completing this course, the student will possess a basic understanding of inferential statistics to provide statistical background for sampling theory and combination and drawing inferences for the populations under study.

16. Course Reading List and References:

Hogg, R., McKean, J. and Graig, A. (1978), Introduction to Mathematical Statistics, Pearson Education, Inc. 8th edition, New York. (Required)

Larsen, R. and Max, M. (2012), Introduction to Mathematical Statistics and its Application, London, Pearson. (Optional)

Wani, J. (1971), Probability & Statistical Inference, USA, Meredith Corporation. (Required)

Note**:** For this course, other references such as books or internet links on mathematical statistics could be useful.

17. The Topics: The course topics, which will be Presented throughout this semester for the academic year, are outlined weekly as follows:	**Lecturer's name**

Second Semester **Week 1&2**: Limiting Distribution **Week 3**: Sampling Theory ; **Week 4 & 5**: The distribution of sample mean and its variance, examples and applications; **Week 6**: Expectation of functions of random variables; **Week 7**: The Central Limit Theorem and applications; **Week 8 & 9**: Estimation, Point Estimation; **Week 10**: Methods of Moments and Maximum Likelihood Estimation, applications; **Week 11**: Measures of quality of estimation, main properties and examples; **Week 13**: Interval estimation, confidence intervals for means, variances, differences of means, examples. **Week 14&15 :** Testing Hypothesis with Applications	**Khwazbeen Saida**
18. Practical Topics (If there is any)	
19. Examinations:	
20. Extra notes: Absence Rate for Mathematical Statistics is explained in the table below.	
21. Peer review **پێداچوونەوەی هاوەڵ**	