

Mathematics 3332
Introduction to Mathematical Probability
Fall 2023

Instructor: Dr. Luis Santiago

Email: lsantiag@lakeheadu.ca

Lectures: Mondays and Wednesdays from 10:00 AM to 11:30 AM, RB3026.

Labs: Tuesdays from 10:30 AM to 11:30 AM, RB1022.

Office hours: Mondays from 1:00 PM to 2:00 PM, RB3008.

Textbook: *Introduction to Probability and Statistics*, 4th Edition, by J. S. Milton and J. C. Arnold. Student's Solution Manual (Optional).

Description: As a mathematical introduction to the theory and applications of probability, topics include sample spaces and events, permutations and combinations, binomial coefficients, the probability of an event, some rules of probability, conditional probability, independent events, Bayes Theorem, probability distributions, discrete random variables, continuous random variables, probability density functions, joint distributions, marginal distributions, conditional distributions, the expected value of a random variable, moments, Chebyshev's Theorem, moment-generating functions, conditional expectations, some special probability distributions such as the discrete uniform distribution, the Bernoulli distribution, the binomial distribution, the negative binomial and geometric distributions, the hypergeometric distribution, the Poisson distribution, the multinomial distribution, the uniform distribution, the gamma, exponential, and chi-square distributions, the beta distribution, the normal distribution, the normal approximation to the binomial distribution, the bivariate normal distribution, etc., functions of random variables, and limit theorems such as the law of large numbers and the central limit theorem. Basically this course will cover Chapters 1-6.

Labs: The lab will reinforce concepts through explanations and examples, as well as provide students with the opportunity to ask questions about the

content given in class or assignment problems.

Grading Scheme:

Five Assignments	25 %
Midterm Exam 1 (Tuesday October 3 from 10:30 AM to 11:30 AM)	25 %
Midterm Exam 2 (Tuesday November 7 from 10:30 AM to 11:30 AM)	25 %
Midterm Exam 3 (Tuesday November 28 from 10:30 AM to 11:30 AM)	25 %

Accommodations: Lakehead University is committed to achieving full accessibility for persons with disabilities. Part of this commitment includes arranging academic accommodations for students with disabilities to ensure they have an equitable opportunity to participate in all of their academic activities. If you think you may need accommodations, you are strongly encouraged to contact Student Accessibility Services (SAS) and register as early as possible. For more information, please visit:

<http://studentaccessibility.lakeheadu.ca>

Important Dates: Please note the following important dates:

Tuesday September 5, 2023:	First day of classes
Monday December 4, 2023:	Final day of classes
Friday November 3, 2023:	Final date to withdraw
Thursday December 7 to Sunday December 17:	Examination Period
Monday December 18, 2023:	Exam Contingency Date
Monday October 9 to Friday October 13:	Study Week