University of Asia Pacific

Department of Basic Sciences and Humanities

Course Outline

Course Code and Title:	MTH 203: Probability and Statistics
Semester:	Fall Semester 2017
Teacher:	**Dr. Nepal Chandra Roy** Assistant Professor Department of Mathematics University of Dhaka
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Course Description:	**Probability:** Static and random variables (discrete and continuous), occurrence of random variables, concept of population and using statistics to make inference on characteristic(s) of population. Experiments, events, sample space, probability. Conditional probability, partitions, total probability, Bayes' theorem. Mutually exclusive events and independent events. Probability distributions: binomial, multinomial distribution, Poisson, hyper geometric, uniform, normal, exponential; introduction to Gamma and Weibul distributions. Concept of expected value, variance, standard deviation. Presence of the distributions in different fields particularly in engineering fields. Probability density function and (cumulative) distribution function. Normal approximation to binomial; Poisson approximation to binomial. Functions of random variables, expected value, variance, standard deviation. Two-dimensional variates, marginal distributions conditional distributions, covariance, correlation, conditional expectation, central limit theorem. **Statistics:** Frequency distribution: nature of data, methods of data collection, and representation of statistical data; histogram, arithmetic mean, geometric mean, harmonic mean, median, mode and other measures of central tendency; quartiles, deciles, and percentiles. Standard deviation, mean deviation and other measures of dispersion. Moment, skewness and kurtosis. Estimation: point estimation, interval estimation, estimation of mean and standard deviation,

	confidence intervals, sample size. Hypothesis testing; regression analysis, correlation, chi-square and non parametric statistics; time series. Application of statistics in queuing theory and simulation, introduction to queuing models: M/M/1, M/D/1, M/G/1.
Teaching method:	Lectures, assignments, interactive sessions etc.
Prerequisites:	N/A

Course schedule / Class schedule:

Lecture No.	Expected topics to be delivered
Lecture 1	Static and random variables (discrete and continuous), occurrence of random variables, concept of population and using statistics to make inference on characteristic(s) of population. Experiments, events, sample space, probability
Lecture 2	Conditional probability, partitions, total probability, Bayes' theorem
Lecture 3	Mutually exclusive events and independent events
Lecture 4	Probability distributions: binomial, multinomial distribution, Poisson
Lecture 5	Probability distributions: hyper geometric, uniform, normal, exponential
Lecture 6	Introduction to Gamma and Weibul distributions
Lecture 7	**Class test based on Lecture 1-6** Concept of expected value, variance, standard deviation
Lecture 8	Presence of the distributions in different fields particularly in engineering fields
Lecture 9	Probability density function and (cumulative) distribution function
Lecture 10	Normal approximation to binomial; Poisson approximation to binomial
Lecture 11	Functions of random variables, expected value, variance, standard deviation
Lecture 12	Two-dimensional variates, marginal distributions conditional distributions, covariance
Lecture 13	Correlation, conditional expectation, central limit theorem
Lecture 14	Review class **Class test based on Lecture 7-13**

Mid Term Examination	
Lecture 15	Frequency distribution: nature of data, methods of data collection, and representation of statistical data; histogram
Lecture 16	Arithmetic mean, geometric mean, harmonic mean
Lecture 17	Median, mode and other measures of central tendency: quartiles, deciles, and percentiles
Lecture 18	Standard deviation, mean deviation and other measures of dispersion
Lecture 19	Moment
Lecture 20	Skewness and kurtosis
Lecture 21	Estimation: point estimation, interval estimation, estimation of mean
Lecture 22	**Class test based on Lecture 15-21** Estimation: estimation of standard deviation, confidence intervals, sample size.
Lecture 23	Hypothesis testing; regression analysis
Lecture 24	Correlation, chi-square
Lecture 25	Non parametric statistics; time series
Lecture 26	Application of statistics in queuing theory and simulation
Lecture 27	Introduction to queuing models: M/M/1, M/D/1, M/G/1
Lecture 28	**Class test based on Lecture 22-27** Review on whole syllabus
Semester Final Examination	

Reference books:

1. Walpole and Mayers, Probability and Statistics for Engineering and Scientists, Pearson.
2. R.V. Hogg and E. Tanis, Probability and Statistical Inference, Pearson
3. W. Mendenhall, Statistics for Engineering and the Sciences, Pearson
4. J. L. Devore, Probability and Statistics for Engineering and Sciences, Int' Edition
5. L. L. Lapin, Probability and Statistics for Modern Engineering, Wadsworth Publishing Co Inc.
6. M. R. Spiegel and L. J. Stephens, Statistics, Schaum's Outlines.

Assessment methods:

Module	Weight/Percentage
Class tests	20%
Attendance	10%
Midterm	20%
Final	50%
Total	**100%**

Grading system:

Marks Obtained	Letter Grade	Grade Point
80% and above	**A+**	4.00
75% to less than 80%	**A**	3.75
70% to less than 75%	**A−**	3.50
65% to less than 70%	**B+**	3.25
60% to less than 65%	**B**	3.00
55% to less than 60%	**B−**	2.75
50% to less than 55%	**C+**	2.50
45% to less than 50%	**C**	2.25
40% to less than 45%	**D**	2.00
Less than 40%	**F**	0.00
Incomplete Works	**I**	—

Students' Responsibilities:

1. All the students have to attend the classes regularly (70% class attendance is mandatory)
2. All the students have to follow class lectures properly
3. Students must need to be present at scheduled quizzes/exams
4. All the students have to submit their assignments within the deadline determined by the course instructor