

# EAST WEST UNIVERSITY

## Department of Mathematical and Physical Sciences

### Course Outline for Spring 2020

<b>Course Code:</b> STA102	<b>Course Title:</b> Statistics and Probability	<b>Section:</b> 5	<b>Credits:</b> 3
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**Instructor:** F. M. Arifur Rahman,  
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**UTA:** Md. Sadimur Rahman (contact no. 01774383135)

#### Class Routine and Office Schedule:

Day / Time	9:00-10:00	10:10-11:40	11:50-1:20	1:30-3:00	3:10-4:40
(S) Sunday	Office Hour	MAT101 (11) AB1-501	MAT101 (8) AB1-602	STA102 (5) AB1-402	Office Hour
(M) Monday			Office Hour	GEN225 (2) AB1-502	
(T) Tuesday	Office Hour	MAT101 (11) AB1-501	MAT101 (8) AB1-602		
(W) Wednesday		Office Hour	Office Hour	GEN225 (2) AB1-502	Office Hour
(R) Thursday			Office Hour	STA102 (5) AB1-402	Office Hour

#### Course Description:

This course is an introductory & comprehensive course on Statistics including basic concepts of Statistics and commonly used basic statistical tools and methods. This covers basic concepts, data collection methods, data summarization and presentation, measures of central tendency and dispersion, simple correlation and regression analysis, basic probability theory, probability distributions, stochastic process, statistical quality control, and computer simulation.

#### Course learning outcomes:

After completion of this course a student will be able to-

1. Use statistical methods to acquire required data for analysis
2. Differentiate between different data and variable types and their measures
3. Summarize and present the key characteristics of data using tables and graphs
4. Find correlation and cause-and-effect relations between two variables
5. Interpret & explain outcomes from analyses effectively
6. Find and distribute probabilities among related events
7. Measure quality of a production process
8. Identify and hence model the stochastic behavior of any process
9. Apply the basic Statistical tools and techniques in the relevant and required areas

#### Text Books:

1. Probability and Statistics in Engineering-William W. Hines, Douglas C. Montgomery, David M. Goldsman, Connie M. Borrer. 4<sup>th</sup> Edition. John Wiley & Sons. Inc.
2. Probability & Statistics for Engineers and the Sciences- Jay L. Devore. 8<sup>th</sup> Edition. Brooks/Cole CENGAGE Learning.
3. Statistical Technique in Business & economics- Douglas A. Lind, William G. Marchal, and Samuel A. Wathen. 15<sup>th</sup> edition. Mc Graw Hill Education.

**Reference Books:**

1. Applied Statistics and Probability for Engineers- Douglas C. Montgomery, George C. Runger. 6<sup>th</sup> Edition. Wiley.
2. Introduction to Statistics and Probability- M. Nurul Islam. 4<sup>th</sup> Edition. Mullick & Brothers.
3. An Introduction to Stochastic Modelling- Howard M. Taylor, Samuel Karlin.

**Score Distribution:**

Midterm-1	20%
Midterm-2	20%
Quizzes	15%
Assignment	10%
Class Attendance	5%
Final	30%
<b>Total</b>	<b>100%</b>

**Grading System:**

Marks	Grade	Marks	Grade
97-100	A+ (4.00)	73-below 77	C+ (2.30)
90-below 97	A (4.00)	70- below 73	C (2.00)
87- below 90	A- (3.70)	67- below 70	C- (1.70)
83- below 87	B+ (3.30)	63-below 67	D+ (1.30)
80-below 83	B (3.00)	60- below 63	D (1.00)
77- below 80	B- (2.70)	Below 60	F (0.00)

**Detailed Course Outline & lesson plan (approximate):**

Week	Date	Topics	Remark
1	Jan 9	<b>Introduction:</b> Introduction, Definition and Scope of Statistics, Population & Sample, Parameter & Statistic, Variables, Types of Variables	
2	Jan 12 & 16	<b>Summarization:</b> Construction of a Frequency Distribution Table, Cumulative frequency <b>Graphical Presentation:</b> Bar Diagram, Pie Diagram, Histogram, Frequency Polygon, and Cumulative Frequency Curve. Line graph, Dot plot.	
3	Jan 19, 21 & 23	<b>Measure of Central Tendency:</b> Mean, Median & Mode for raw data. Geometric mean, Harmonic mean, Quartiles, Deciles, and Percentiles. <b>Measures of Dispersion:</b> Range; Variance, SD for raw data; Coefficient of Variation (CV)	
4	Jan 26	<b>Shape Characteristics:</b> Skewness & kurtosis. Box plot and it's use in outlier detection. Steam & Leaf plot. <b>Correlation:</b> Bi-variate data, Scatter diagram, Pearson's correlation coefficient	<b>Quiz 1:</b> Jan 26
5	Feb 2	<b>Review</b>	
<b>Mid Term I Examination (February 06, 2020 Thursday)</b>			
6	Feb 9 & 13	<b>Regression:</b> Fitting a simple linear regression model, R square, Standard error of estimate <b>Probability:</b> Basic Concepts of Probability, Uses of Venn Diagram. Rule of Addition, Rule of Multiplication, Independence, Conditional Probability	
7	Feb 20	<b>Probability</b>	
8	Feb 23	<b>Probability Distributions:</b> Random variable, Basic Concepts of Discrete & Continuous Distributions, Mathematical expectations.	
9	Mar 1 & 5	<b>Probability Distributions:</b> Binomial & Poisson Distributions, Uniform Distributions, Exponential Distributions, Normal Distributions	<b>Quiz 2:</b> Mar 1
10	Mar 8	<b>Review</b>	
<b>Mid Term II Examination (March 12, 2020 Thursday)</b>			
11	Mar 15 & 19	<b>Stochastic Process:</b> Markov Process, Queueing Process	
12	Mar 22 & 25	<b>Statistical Quality Control:</b> Control Charts, p chart	<b>Quiz 3:</b> Mar 25
13	Mar 29 & Apr 2	<b>Statistical Quality Control:</b> c chart, u chart <b>Computer Simulation:</b> Generating random values from Uniform distribution, Exponential distribution, Normal distribution. Monte Carlo Integration.	
14	Apr 5	<b>Review</b>	
<b>Final Examination (April 16, 2020 Thursday)</b>			

Note:

- Assignment submission dates are- **Jan 26, Mar 5 & Apr 5.**
- Monday, 10 February 2020 is earmarked for Mid Term I Exams for students who will have more than two exams on a single day as per the schedule above.
- Monday, 09 March 2020 is earmarked for Mid Term II Exams for students who will have more than two exams on a single day as per the schedule above.
- Monday, 13 April 2020 is earmarked for Final Exams for students who will have more than two exams on a single day as per the schedule above. The class teachers will collect the information from the students

immediately who have more than two exams on a single day and report it to respective chairpersons for rescheduling these exams on Monday, 13 April 2020.

#### Ground rules:

1. Students must be present in at least 80% classes.
2. Zero tolerance for any type of cheating in exams
3. No makeup for quizzes
4. Makeup for mid-exams will only be allowed for appropriate cases with supporting documents.
5. Student must bring scientific calculator and required course materials in classes.
6. Student must bring scientific calculator and required exam materials in exams.

#### Important Dates to remember

	Date	Day	Event
January	January 06	Monday	<b>First Day of Classes</b> <b>Payment</b> of tuition fees for <b>continuing students</b> : As per the Payment Schedule (06 January 2020 to 15 January 2020)
	January 08	Wednesday	Last day to Add Courses Last day to Drop Course(s)/Semester with 100% Refund
	January 14	Tuesday	Last day to clear Incomplete grades (“I” grade)
	January 15	Wednesday	Last date of <b>payment</b> of tuition fees <b>without late fee</b>
	January 20	Monday	Last day of Tuition Payment with Late Fee of Tk. 500/-
	January 23	Thursday	Last day of Tuition Payment with Late Fee of Tk. 1000/-
	January 27	Monday	<b>Suspension of classes on account of Convocation</b>
	January 28	Tuesday	19 <sup>th</sup> Convocation (2020)
	January 29	Wednesday	<b>Holiday: Saraswati Puja</b>
February	February 02	Sunday	Last day to Drop Course(s)/Semester with 85% Refund
	February 04	Tuesday	<b>Blocking of ID Numbers of Defaulting Students</b>
	February 06-12	Thursday-Wednesday	<b>Mid Term I Examinations</b>
	February 20	Thursday	Last Day to Drop Course(s)/Semester with 50% Refund
	February 21	Friday	<b>Holiday: Shaheed Day &amp; International Mother Language Day</b>
March	March 05-11	Thursday-Wednesday	<b>Mid Term II Examinations</b>
	March 15	Sunday	Regular Tuesday Classes
	March 17	Tuesday	<b>Holiday: Birthday of the Father of the Nation Bangabandhu Sheikh Mujibur Rahman</b>
	March 19	Thursday	Last day of Withdrawal of Course(s)/Semester (“W” grade)
	March 26	Thursday	<b>Holiday: Independence &amp; National Day</b>
	March 28-Apr 01	Saturday-Wednesday	Advising of Courses for Summer 2020 (ongoing students)
April	April 05	Sunday	<b>Last Day of Classes</b>
	April 08-16	Wednesday-Thursday	<b>Final Examinations</b> <b>(Wednesday, 15 April: Tuesday schedule will be followed)</b>
	April 09	Thursday	<b>Holiday: Shab-E-Barat *</b>
	April 11	Saturday	<b>Admission Test for Summer 2020</b>
	April 14	Tuesday	<b>Holiday: Bengali New Year’s Day</b>
	April 20	Monday	Submission of Final Grades
	April 22-27	Wednesday-Monday	Semester Break
	April 28	Tuesday	University Reopens for Summer 2020
	April 30	Thursday	Orientation for Summer 2020
May 03	Sunday	First Day of Classes for Summer 2020	