

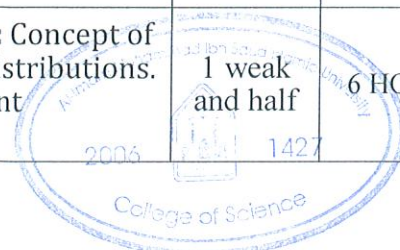
## STA 111- Introduction to Probability and Statistics

<b>Instructor/coordinator</b>	
<b>Credits</b>	4
<b>Prerequisite:</b>	MAT113, Applied Mathematics (1)
<b>E-Mail:</b>	
<b>office Phone :</b>	
<b>Office Location:</b>	
<b>Textbook:</b>	Probability & Statistics for Engineers & Scientists, 8th Edition, Ronald Walpole, Raymond Myers, Sharon Myers, Keying Ye, Person Education International, ISBN: 9780132047678.

### Objectives:

- Describe discrete data graphically and compute measures of centrality and dispersion
- Compute probabilities by modeling sample spaces and applying rules of permutations and combinations, additive and multiplicative laws and conditional probability
- Construct the probability distribution of a random variable, based on a real-world situation, and use it to compute expectation and variance (a, b)
- Compute probabilities based on practical situations using the binomial and normal distributions.
- Be familiar with statistics and random samples, sampling experiments, the sampling distribution for a sample mean, and the sampling distribution of a sample proportion.

1 Topics to be Covered		
List of Topics	No of Weeks	Contact hours
<b>Chapter 1 – Descriptive Statistics:</b> Definitions. Need of Statistics & Statistical Problem Solving Methodology & Introduction to Data Collection. Data Organization and Frequency Distributions. Graphic Presentations of Frequency Distributions. Computing Measures of Central Tendency. Computing Measures of Dispersion and Relative Position. Using Technology.	2 weeks	8 HOURS
<b>Chapter 2 – Probability:</b> Some Basic Considerations. Events. Counting Sample Points. Interpretations of Probability. Addition Rules. Conditional Probability. Multiplication and Total Probability Rules. Independence. Bayes' Theorem.	3weeks	12 HOURS
<b>Chapter 3 – Random Variables and Probability Distribution:</b> Concept of Random Variable. Discrete Random Variables and Probability Distributions. Continuous Random Variables and Probability Distributions. Joint Probability Distributions.	1 weak and half	6 HOURS



<b>Chapter 4 – Mathematical Expectation:</b> Mean of Random Variable. Variance and Covariance of Random Variables. Means and Variances of Linear combinations of Random Variables.	1 week and half	6 HOURS
<b>Chapter 5 – Some Discrete Probability Distributions:</b> Bernoulli & Binomial Distribution. Hypergeometric Distribution. Geometric and Negative Binomial Distributions. Poisson Distribution	1 week	4 HOURS
<b>Chapter 6 – Some Continuous Probability Distributions:</b> Continuous Uniform Distribution, Gamma and Exponential Distribution, Normal Distribution. Areas under the Normal Curve. Applications of the Normal Distribution. Normal Approximation to the Binomial	1 week and half	6 HOURS
<b>Chapter 7 – Simple Linear Regression and Correlation:</b> Introduction to Linear Regression. The Simple Linear Regression Model. Least Squares and the Fitted Model.	1 week and half	6 HOURS
<b>Chapter 8 – Fundamental Sampling Distributions and Data Descriptions:</b> Random Sampling, Some Important Statistics. Sampling Distribution. Sampling Distribution of Means and the Central Limit Theorem. Sampling Distribution of $S^2$ . $t$ -Distribution. $F$ -Distribution	2 weeks	8 HOURS
<b>REVIEW</b>	1 week	5 HOURS

**Assessment:**

Assessment task	Week due	Proportion of Final Assessment
Midterm 1	Around 6 <sup>th</sup> -7 <sup>th</sup> week	20 %
Midterm 2	Around 11 <sup>th</sup> -12 <sup>th</sup> week	20 %
Quizzes, Attendance, Participation and Homeworks	All the semester	20 %
Final Exam	Around 15 <sup>th</sup> -16 <sup>th</sup> week	40 %

