KINGDOM OF SAUDI ARABIA

Technical and Vocational Training Corporation

General Directorate of Curricula

المؤسسة العامة للتدريب التقني والمهني
Technical and Vocational Training Corporation

General Studies Department

General Courses

Department	General Studies Center	Major				
Course Name	Statistics and Probability	Course Code	STAT 303			
Prerequisites	---	**Credit Hours**	3		CTH	4
		CRH	L	3	P	0	T	1

Course Description :

This course is designed for students majoring in engineering of technology. Topics include: Counting Rules and Probability, Random variables, Probability distribution, Simple linear regression and Correlation, Introduction to statistics and Parameter Estimation.

General Objective:

- **To give the students an understanding of statistics.**
- **To learn some commonly used statistical techniques.**
- **To apply these techniques in describing and analyzing data.**
- **To use statistics to solve different kind of problems.**
- **To recognize good statistical studies.**
- **To gain an appreciation for analytical skills.**

Detailed Objectives:
Trainee will be able to:

1- - Determine sample spaces and find the probability of an event, using classical probability or empirical probability.
   - Find the probability of compound events, using the addition rules.
   - Find the probability of compound events, using the multiplication rules.
   - Find the conditional probability of an event.
   - Find the total number of outcomes in a sequence of events, using the fundamental counting rule.
   - Find the number of ways that r objects can be selected from n objects, using the permutation rule.
   - Find the number of ways that r objects can be selected from n objects, without regard to order, using the combination rule.
   - Find the probability of an event, using the counting rule.

2- - Find the mean, variance, standard deviation, and expected value for a discrete and continuous random variable.
   - Find the mean, variance, standard deviation, and expected value for a Moment generating function and probability generating function.

3- - Find the mean, variance, standard deviation for the variable of some distributions.
   - Find the exact probability for X successes in n trails of a binomial distribution.
   - Find probabilities for outcomes of variable, using Poisson distribution.
   - identify the properties of a uniform distribution.
   - Find probabilities for a uniformly distributed variable.
   - Identify the properties of a exponential distribution.
   - Find probabilities for a exponentially distributed variable.
   - Identify the properties of a normal distribution.
   - Identify distributions as symmetric or skewed.
   - Find the area under the standard normal distribution, given various Z value.
   - Find probabilities for a normally distributed variable by transforming it into a standard normal distribution.
   - Find specific data values for given percentages, using the standard normal distribution.

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4-	- Find a prediction. - Compute the equation of the regression. - Draw a scatter plot for a of ordered pairs. - Compute the correlation coefficient.
5-	- Determine reasons for sampling. - Find sampling methods. - Find statistic for sampling distribution. - Find sampling distribution of sample means. - Find sampling distribution of variance. - Point Estimation. - Interval Estimation. - Confidence Interval Estimation.

Detailed of Theoretical Contents			
Hours	**Contents**		**Assessment Tools**
10	**Counting Rules and Probability:** • The Basic Principle of Counting, Permutations, Combinations. • Random experiment, Sample space, Events, Axioms of probability. • Conditional probability and independence, Bayes theorem.		Quiz: 1 Exam: 1 Final Exam
	Textbook	1	Bluman, "Elementary Statistics a Step by Step Approach", 6th Edition (2006)
		2	Sheldon Ross, "A FIRST COURSE IN PROBABILITY", 7th Edition
6	**Random variables:** • Discrete and continuous Random variables, expected value , variance – probability mass function and probability density function . • Moment generating function and probability generating function.		Quiz: 2 Exam: 1 Final Exam
	Textbook	1	Bain & Engelhardt, Introduction to Probability and Mathematical Statistics, Duxbury Press
		2	G.M. El-Sayyad: Theory of probability, دار الآفاق – جده ، ١٩٩٠
10	**Probability distribution:** • One variable discrete probability distributions (Binomial, Poisson). • One variable continuous probability distributions (Uniform, Exponential , Normal).		Quiz: 3 Exam: 2 Final Exam
	Textbook	1	Bain & Engelhardt, Introduction to Probability and Mathematical Statistics, Duxbury Press
		2	G.M. El-Sayyad: Theory of probability, دار الآفاق – جده ، ١٩٩٠
6	**Simple linear regression and Correlation:** • Prediction – Regression Analysis.		Quiz: 4 Exam: 2 Final Exam

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Hours	Contents			Assessment Tools
	Detailed of Theoretical Contents			
	• Pearson's correlation coefficient and Spearman's rank correlation coefficient.			
	Textbook	1	Bluman, "Elementary Statistics a Step by Step Approach", 6th Edition (2006)	
		2	Larson & Farber, "Elementary Statistics: Picturing the World", 3rd Edition (2006)	
6	**Introduction to statistics and Parameter Estimation:** • Sampling Theory - Sample Distribution Function - Samples and Statistics. • Methods of Estimation (Point , Interval) - Confidence Interval.			Quiz: 5 Final Exam
	Textbook	1	Devore, Jay L., Probability and Statistics for Engineering and the Sciences, Eighth Edition	
		2	Bluman, "Elementary Statistics a Step by Step Approach", 6th Edition (2006)	

Hours	Contents			Assessment Tools
	Detailed of Practical Contents			
2	**Counting Rules and Probability:** • Factorials, Permutations, and Combinations. • Constructing a Relative Frequency Distribution.			Quiz: 1 Exam: 1 Final Exam
	Textbook	3	Bluman, "Elementary Statistics a Step by Step Approach", 6th Edition (2006)	
		4	Ezz, " DISCOVERING STATISTICAL ANALYSIS & BOOTSTRAP BY USING IBM-SPSS ", 1st Edition (2013)	
2	**Random variables:** • Calculating the Mean and Variance of Discrete and continuous Random Variable. •			Quiz: 2 Exam: 1 Final Exam
	Textbook	3	Bluman, "Elementary Statistics a Step by Step Approach", 6th Edition (2006)	
		4	Ezz, " DISCOVERING STATISTICAL ANALYSIS & BOOTSTRAP BY USING IBM-SPSS ", 1st Edition (2013)	
4	**Probability distribution:** • Binomial Distribution and Graph. • Poisson Distribution. • Normal Distribution. • Exponential Distribution.			Quiz: 3 Exam: 2 Final Exam
	Textbook	3	Bluman, "Elementary Statistics a Step by Step Approach", 6th Edition (2006)	

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Detailed of Practical Contents			
Hours		**Contents**	**Assessment Tools**
	4	Ezz, " DISCOVERING STATISTICAL ANALYSIS & BOOTSTRAP BY USING IBM-SPSS ", 1st Edition (2013)	
3	**Simple linear regression and Correlation:** • Scatter Plot. • Prediction – Regression Analysis. • Pearson's correlation coefficient and Spearman's rank correlation coefficient.		Quiz: 4 Exam: 2 Final Exam
	Textbook	3	Bluman, "Elementary Statistics a Step by Step Approach", 6th Edition (2006)	
		4	Ezz, " DISCOVERING STATISTICAL ANALYSIS & BOOTSTRAP BY USING IBM-SPSS ", 1st Edition (2013)	
3	**Introduction to statistics and Parameter Estimation:** • Sampling Theory - Sample Distribution Function - Samples and Statistics . • Methods of Estimation (Point , Interval) - Confidence Interval.		Quiz: 5 Final Exam
	Textbook	3	Bluman, "Elementary Statistics a Step by Step Approach", 6th Edition (2006)	
		4	Ezz, " DISCOVERING STATISTICAL ANALYSIS & BOOTSTRAP BY USING IBM-SPSS ", 1st Edition (2013)	

Textbooks	• Bluman, "Elementary Statistics a Step by Step Approach", 6th Edition (2006)
	• Sheldon Ross, "A FIRST COURSE IN PROBABILITY", 7th Edition
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	• G.M. El-Sayyad: Theory of probability, دار الآفاق – جده ، ١٩٩٠
	• Larson & Farber, "Elementary Statistics: Picturing the World", 3rd Edition (2006)
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	• Ezz, " DISCOVERING STATISTICAL ANALYSIS & BOOTSTRAP BY USING IBM-SPSS ", 1st Edition (2013)

List of Detailed Equipment for Laboratory, Workshop or Lab

No.	Laboratory name / workshop	Capacity of training	Human Resources with Certificate
1-	**Computer lab**	**40**	

Workshop / Lab of Computer		
No.	**Product's Name**	**Quantity**
1-	Computer devices.	40
2-	SPSS program.	40
3-	MINITAB program.	40
4-	EXCEL program.	40