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COURSE TITLE: STATISTICS FOR MANAGEMENT

COURSE CODE: QAM 601

CREDIT UNITS: 03

COURSE LEVEL : PG

L	T	P/ S	SW/ FW	TOTAL CREDIT UNITS
3	-	-	-	03

Course Objectives: The objective of this course is to

1. Acquaint students with a conceptual introduction to the field of Statistics and its applications,
2. Develop the understanding of various statistical tools used for decisions making and how each applies to and can be used in the business environment..

Pre-requisites:

Fundamental understanding and knowledge of pre-calculus algebra, and proficiency with a computer spread sheet program.

Student Learning Outcomes: On completion of the course the student will be able to:

1. Arrange and describe information using numerical and graphical procedures.
2. Compute descriptive statistical measures to business situations.
3. Compute and apply probability distributions to model different types of business processes.
4. Perform test of hypothesis as well as calculate confidence interval for a population parameter for single sample and two sample cases.
5. Learn non-parametric test such as the Chi-Square test for Independence as well as Goodness of Fit.
6. Understand and apply forecasting techniques for business decision making and to uncover relationships between variables to produce forecasts of the future values of strategic variables

Course Contents/Syllabus:

	Weightage (%)
Module I : Introduction	20
<ul style="list-style-type: none"> ▪ Statistical thinking and analysis ; ▪ Statistics defined; Types of statistical methods - Descriptive and inferential statistics; Importance and scope of statistics ;. ▪ Scales of measurement; ▪ Basic statistical concepts: population and sample. <p>Tabular and Graphical Descriptive Techniques using MS Excel and/or Minitab:</p> <ul style="list-style-type: none"> ▪ Bar chart, Pie Chart, Histogram, Frequency Polygon, Ogive, Pareto Chart. ▪ Stem-and-leaf display, Cross tabulations, Scatter plot and Trend line. <p>Numerical Measures</p> <ul style="list-style-type: none"> ▪ Arithmetic Mean, Median and Mode. ▪ Partition Values- Quartiles, and percentiles. ▪ Measures of Variability: Range, IQR; Variance, Standard Deviation, Coefficient of variation. ▪ Using MS Excel and/or Minitab for Numerical Measures 	

Module II : Probability and Probability Distributions	20
<ul style="list-style-type: none"> ▪ Types of events and Algebra of events. Assigning probability to events; Joint,. ▪ Marginal and Conditional Probability. ▪ Probability Rules; complement Rule, Multiplication Rule, Addition Rule, Bayes' Theorem. <p>Probability Distributions:</p> <ul style="list-style-type: none"> ▪ Mean or Expected value of random variable. ▪ Variance and Standard Deviation of random variables.. ▪ Binomial Probability Distribution, Poisson Probability Distribution and Normal Probability Distribution. ▪ Using MS Excel and/or Minitab for computation of Binomial, Poisson and Normal probabilities. 	
Module III : Sampling, Sampling Distribution and Estimation	20
<ul style="list-style-type: none"> ▪ Sampling: Basic Concepts, Types of Sampling and Non-Sampling Errors and Precautions, ▪ Central Limit Theorem, ▪ Sampling Distribution of the mean, Sampling distribution of proportion. ▪ Estimation: Types Estimates, Using z Statistic for estimating population mean, ▪ Confidence interval for estimating population mean when population SD is unknown, ▪ Estimating population mean using t Statistic (small sample case), and Confidence interval estimation for population proportion. ▪ Using MS Excel and/or Minitab for confidence interval construction. 	
Module IV : Hypothesis Testing	20
<p>Fundamental Concepts of Hypothesis Testing:</p> <ul style="list-style-type: none"> ▪ Developing null and alternate hypothesis, ▪ Hypothesis testing procedure, the critical value of the test statistic, regions and rejection and non-rejection, ▪ Type I error and Type II error, ▪ Level of significance, 	

<ul style="list-style-type: none"> ▪ The confidence coefficient, The power of a test, ▪ The p-value approach to hypothesis testing. <p>Inference about a Population:</p> <ul style="list-style-type: none"> ▪ For single population mean using z-statistic, for single population mean using t-statistic, hypothesis testing for population proportion. <p>Inference about Comparing Two Populations:</p> <ul style="list-style-type: none"> ▪ Inference about the difference between two population means – ▪ Independent samples and Matched Samples, ▪ Inference about the difference between two population proportions, Inference about the ratio of two population variances. <p>Analysis of Variance (Analysis and Interpretation of MS Excel and/or Minitab Output only):</p> <ul style="list-style-type: none"> ▪ Testing for equality of k- population means, <p>Chi-Squared Tests:</p> <ul style="list-style-type: none"> ▪ Chi-squared goodness of fit test, and test of independence. Using MS Excel and/or Minitab for Chi-squared test. 	
<p>Module V : Forecasting Techniques</p>	<p>20</p>
<ul style="list-style-type: none"> ▪ Measures of Linear Relationship: covariance, coefficient of correlation. ▪ Regression: Model, Estimating the coefficient using least squares method. Assessing the Model (Analysis and Interpretation of Excel and/or Minitab Output only); ▪ Standard Error of Estimate, Coefficient of determination, <p>Time Series Analysis:</p> <ul style="list-style-type: none"> ▪ Variation in Time Series, Numerical application of trend analysis only. 	

Pedagogy for Course Delivery: The course pedagogy will include lectures, numerical practice and discussion on numerical applications of the topics covered.

Assessment/ Examination Scheme:

Theory L/T (%)	Lab/Practical/Studio (%)	End Term Examination
30%		70%

Theory Assessment (L&T):

	End Term Examination				
Components (Drop down)	Mid-term	Term paper	Case/Quiz	A	End Term Examination
Weightage (%)	10	10	5	5	70

References:

1. Sharma, J.K. (2014), Business Statistics, Pearson Education India.
2. Keller, Gerald (2007), Statistics for Management and Economics, Cengage Learning
3. Levin Richard I. & Rubin David S.(1998), Statistics for Management, Pearson Education India
4. Anderson D.R; Sweeny D.J, Williams T.A (2002), Statistics for Business and Economics, Cengage learning.
5. Kazinier L. J, & Pohl N.F. (2004), Basic Statistics for Business and Economics, New York: McGraw Hill.
6. Stephen .K.C. (2002), Applied Business Statistics: Text, Problems and Cases. New York: Harper and Row.
7. Ken Black (2011), Business Statistics, Wiley Publication

