SARDAR PATEL UNIVERSITY
Vallabh Vidyanagar, Gujarat
(Reaccredited with 'A' Grade by NAAC (CGPA 3.25)
Syllabus with effect from the Academic Year 2021-2022

MASTER OF SCIENCE IN QUALITY AND PRODUCTIVITY MANAGEMENT
M.Sc. QPM, Semester – II

Course Code	PS02CQPM55	Title of the Course	STATISTICAL METHODS THROUGH SPSS
Total Credits of the Course	4	Hours per Week	4

Course Objectives:	1. To introduce students to the basic practice of statistics by using SPSS Statistics and learn how to perform basic statistical analyses.

Course Content		
Unit	Description	Weightage* (%)
1.	Introduction: Samples and the Population, Level of Measurement A Special Case: Rating Scales, Independent and Dependent Variables, Data Access. Data Checking: Viewing a Few Cases, Minimum, Maximum and Number of Valid Cases, Identifying Inconsistent Responses, When Errors are Discovered, SPSS Missing Values Option. Describing Categorical Data: Frequency Tables and Bar Charts, Standardizing the Chart Axis, Pie Charts. Comparing Groups (Categorical Data) A Basic Two-Way Table, Chi – Square Test of Independence, Requesting the Chi-Square Test, Different Tests, Different Results? Association Measures Available within Crosstabs, Graphing Cross Tabulation Results, Three-Way Tables, Extensions.	25
2.	Exploratory Data Analysis: Interval Scale Data – Frequency Tables and Histograms, Exploratory Data Analysis, Options with Missing Values, Measures of Central Tendency, Variability Measures, Confidence Band for Mean, Shape of the Distribution, Stem & Leaf Plot, Box & Whisker Plot, Saving an Updated Copy of the Data. Mean Differences Between Groups I: (Simple Case) Logic of Testing for Mean Differences, Sample Size, Exploring the Different Groups, T – Test, Displaying Mean Differences, Paired T Test, Normal Probability Plots.	25
3.	Mean Differences Between Groups II: (One Factor ANOVA) Logic of Testing for Mean Differences, Factors, Exploring the Data, Running One-Factor ANOVA, One-Factor ANOVA Results, Post Hoc Testing of Means, Graphing the Results. Mean Differences Between Groups III: (Two Factor ANOVA): Logic of Testing and Assumptions, How Many Factors? Interactions, Exploring the Data, Two-Factor ANOVA, The ANOVA Table,	25

SARDAR PATEL UNIVERSITY
Vallabh Vidyanagar, Gujarat
(Reaccredited with 'A' Grade by NAAC (CGPA 3.25)
Syllabus with effect from the Academic Year 2021-2022

		Observed Means, Presenting the Results.	
4.		Bivariate Plots and Statistics: Reading the Data, Exploring the Data, Scatterplots, Correlations. Introduction to Regression: Introduction and Basic Concepts, The Regression Equation and Fit Measure, Residuals and Outliers, Assumptions, Simple Regression, Multiple Regression, Residual Plots, Multiple Regression Results, Residual and Outlier Results, Summary of Regression Results, Stepwise Regression, Stepwise Regression Results, Stepwise Summary.	25

Teaching-Learning Methodology	Interactive Class Lectures, ICT Learning Tools

Evaluation Pattern		
Sr. No.	Details of the Evaluation	Weightage
1.	Internal Written / Practical Examination (As per CBCS R.6.8.3)	15%
2.	Internal Continuous Assessment in the form of Practical, Viva-voce, Quizzes, Seminars, Assignments, Attendance (As per CBCS R.6.8.3)	15%
3.	University Examination	70%

Course Outcomes: Having completed this course, the learner will be able to	
1.	Be familiar with basic SPSS functions and its tools. These functions and tools will enable students to proficiently open and create SPSS data files.
2.	Managing and preparing data (entering, labelling, creating, cleaning, merging, tabulation, etc.)
3.	Providing meaningful and compact visual representations of the data.
4.	Presenting data using SPSS generated graphs and summary statistics: descriptive statistics.
5.	Conducting Chi-Squared tests for independence, association and goodness of fit.
6.	Conducting independent and paired samples t-tests to compare two groups.

SARDAR PATEL UNIVERSITY
Vallabh Vidyanagar, Gujarat
(Reaccredited with 'A' Grade by NAAC (CGPA 3.25)
Syllabus with effect from the Academic Year 2021-2022

7.	Conducting a one-way ANOVA to compare more than two groups where the test variable is collected on a continuous scale and the data in each group follows the normal distribution: One-way ANOVA.
8.	Conducting a two-way ANOVA to compare more than two groups where the test variable is collected on a continuous scale and the data is in the presence of two grouping variables, each group following the normal distribution.
9.	Analysing data when normality assumption for data does not hold, i.e., the data does not follow the normal distribution. The statistical methods to analyse such data are collectively known as Nonparametric methods or distribution free method: non-parametric tests.
10.	Evaluating the association between an outcome and one or multiple exposures where outcome is continuous however, exposure could be numerical or categorical or a combination of both: correlation and linear regression analysis.
11.	Conducting simple as well as multiple regression with residual analysis, and stepwise regressor selection.

Suggested References:	
Sr. No.	References
1.	Huizingh, E. (2007). *Applied Statistics with SPSS*, SAGE.
2.	Carver, R. H. and Nash, J. G. (2011) . *Doing Data Analysis with SPSS*, Cengage Learning.
3.	Gray, C. D., Kinnear, P. R. (2011). *IBM SPSS Statistics 19 Made Simple*, Taylor & Francis.
4.	Field, A. (2000). *Discovering Statistics Using SPSS for Windows: Advanced Techniques for Beginners*, SAGE.
5.	Hedderson. J. and Fisher, M. (1993). *SPSS Made Simple*, Wadsworth Publishing Company.
6.	Elliot T. Berkman and Steven P. Reise (2011). *A Conceptual Guide to Statistics Using SPSS*, SAGE.
7.	Burns, R. and Burns, R. P. (2008). *Business Research Methods and Statistics Using SPSS*, SAGE.

On-line resources to be used if available as reference material

SARDAR PATEL UNIVERSITY
Vallabh Vidyanagar, Gujarat
(Reaccredited with 'A' Grade by NAAC (CGPA 3.25)
Syllabus with effect from the Academic Year 2021-2022

On-line Resources

*****