

# **Tantia University**

Sri Ganganagar  
Ph.D. Course Work Syllabus  
(Revised as Per UGC Regulation 2022)  
Mathematics

**Maximum Marks-120**

**Minimum Marks-66**

## **PART-A**

**Part A- 60 Marks**

**Total Credits = 6**

**Total Hours=6x45= 270 Hours**

### **Introduction to Research**

Introduction of Research, Research methodology, Defining Research problem and formulation of hypothesis, research design, sampling design, measuring and scaling techniques, methods of data collection.

Pure and Applied Research, Exploring or Formulative Research, Descriptive Research, Diagnostic Research/Study, Evaluation Research/Studies, Action Research, Experimental Research, Historical Research, Surveys, Case Study, Field Studies  
Research Ethics: Characteristics and format of research paper, article, thesis writing, review of Related Literature, Purpose of the review, Identification of the related literature. Organizing the related literature.

### **Statistics**

Concept of statistics, relevance in research, parametric and non-parametric data; graphical representation of data: histogram, frequency polygon, ogive and pie chart; Measures of Central Tendency, Correlation, t-test chi square test

### **Computer Application**

Basic and fundamental knowledge of Computer and its Applications. Introduction, Application Area, Operating System, Windows, Office, Internet.

## **PART-B**

**Part B- 60 Marks (Subject based)**

**Total Credits = 6**

**Total Hours=6x45= 270 Hours**

### **1) Experimental Techniques:**

Experimentation, good experiment, advantage and limitation of experimentation, method of data collection, element of experimentation, procedure of planning and conducting the experiment, setting of experiments, randomized design, randomized block design, Latin square design and factorial design, sources of biases or error in experimental data.

**2) Data collection Sources:**

Data collection process, sources and types of data research, Sources of collecting primary data, Source of collecting the secondary data, Scrutiny of secondary data. Advantage and limitation of secondary data, primary v/s secondary data.

**3) Method and Techniques of Data collection. :-**

Observation method, desk research, experimental research, field research(personal interview, mail order survey, telephonic survey)

**4) Processing of data:**

Editing of data, coding of data, classification of data (kind of classification, bases of classification) ,tabulation of data(Type of tables)

**5) Diagrammatic and Graphics presentation of data:**

Diagrammatic presentation, kind of diagrams (line, bar, rectangle, square, circle and pie diagrams), Graphical presentation Kind of graphs (Histogram, Ogive curve)

**6) Interpretation of data:**

Importance and significance of interpretation, interpretation technique process, guide lines of effective interpretation, skewness (measure of asymmetry) , kurtosis . Objective of skewness and kurtosis)

**7) Fundamentals of Hypothesis testing :**

Null hypothesis and alternate hypothesis , procedure of hypothesis testing , standard errors ( type –I and type –II errors ) one tail and two tail tests .

Non parametric tests: chi- square tests, sign test, run test, Wilcoxon Mann Whitney u test, kruskal Wallis test. Limitation of Non – parametric tests, parametric tests; students T-test , correlation coefficient , analysis of variance ( ANOVA) , F-test ,uses of computer oriented data analysis tools ( SPSS,SAS, EXCEL, minitab)