

# Tantia University

Sri Ganganagar

Ph.D. Course Work Syllabus (2016-17)

Physics

Maximum Marks-100

Minimum Marks-55

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## PART-A

Part A- 40 Marks

Total Credits = 4

Total Hours=4x45= 180 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

### (B1): Nonlinear Dynamics and Theoretical Physics:

Iterative Maps, autonomous systems, fixed points, Stability Analysis, Linearization, Phase Plane Analysis, Basic ideas of Chaotic systems

**(B2): Condensed Matter Physics:**

Pseudopotential Method, TGDTA determination of various thermal parameters.

DMA, TPS, DSC, annealing. Compton Scattering, Electron momentum distribution, Compton profile, Fermi Surfaces, Positron Annihilation, Coincidence spectroscopy.

**(B3): Electrodynamics, Atomic, Molecular and Nuclear Physics:**

Hartree-Fock approximation, Spectroscopic analysis, Raman and Infrared spectra. Nonlinear Effects in Plasmas.

Nanotechnology: Z-Scan method, Nano Photonics, optical cavity, thin films, Interaction of radiation with matter on nanoscale.