THIRUVALLUVAR UNIVERSITY

MASTER OF PHILOSOPHY

BIOCHEMISTRY

(FT/PT)

(with effect from 2018-2019)

PART I

CORE COURSE I

RESEARCH METHODOLOGY

UNIT-I: RESEARCH METHODOLOGY

Meaning of research - Objectives of research - motivation of research - Types, approaches and significance - Methods versus methodology - Research in scientific methods - Research process - Criteria for good research - Problem encountered by research in India - Funding agencies.

UNIT-II: RESEARCH DESIGN

Research Problem: Selecting the problem - Necessity of defining the problem - Techniques involved in defining the problem - Research design - Needs and features of good design - Different research design - Basic principles of experimental designs.

UNIT-III: DATA COLLECTION AND DOCUMENTATION

Data collection methods - Data types - Processing and presentation of data - Techniques of ordering data - Meaning of primary and secondary data - The uses of computers in research - The library and internet - Uses of search engines - virtual libraries - common software for documentation and presentation.

UNIT-IV: DATA AND ERROR ANALYSIS

Statistical analysis of data - Standard deviation - Correlation - Comparison of sets of data - Chi squared analysis for data - Characteristics of probability distribution - Binomial, Poisson and normal distribution - Principle of least square fittings - Curve

fitting - Measurement of errors - Types and sources of errors - Determination and control of errors.

UNIT-V: RESEARCH COMMUNICATION

Meaning of research report - Logical format for writing thesis and paper - Essential of scientific report: abstract, introduction, review of literature, materials and methods and discussion - Write up steps in drafting report - Effective illustrations: tables and figures - Reference styles: Harvard and Vancouver systems.

REFERENCE BOOKS:

1. Research Methodology, Methods and Techniques - C.R. Kothari - Wishwa Prakasam Publications, II Edition.
2. Research: An introduction - Robert Ross - Harper and Row Publications.
3. Research methodology - P. Saravanavel - Kitlab Mahal, Sixth Edition.
4. A Hand book of Methodology of Research - Rajammal P.A. Devadass - Vidyalaya Press
5. Introduction to Computers - N. Subramanian
6. Statistical methods - G.W. Snedecor and W. Cocharan - Oxford and IBH, New Delhi.
7. Research Methodology Methods and Statistical Techniques - Santosh Gupta.
8. Statistical Methods - S.P. Gupta
9. Scientific social surveys and research - P. Young - Asia Publishers, Bombay.
10. How to write and publish a scientific paper - R.A. Day - Cambridge University Press.
11. Thesis and Assignment writing - Anderson - Wiley Eastern Ltd.

PART I

PAPER II

ANALYTICAL METHODS

SEPERATION TECHNIQUES

Centrifuge techniques
Preparative centrifugation
Density gradient
Analysis of subcellular fractions
Determination of molecular weight macromolecules
Analytical ultra centrifugation.

CHROMATOGRAPHIC TECHNIQUE

Absorption chromatography
Partition chromatography
Ion exchange chromatography
Exclusion chromatography
Affinity chromatography
HPLC, Application of these techniques

ELECTROPHORETIC TECHNIQUES

General techniques
High voltage electrophoresis
Disc Electrophoresis
Iso electric focussing
Application of these techniques

SPECTROSCOPIC TECHNIQUES

Basic principle
Spectrophotometry
Fluorometry
Flame photometry
ESR
NMR
Mass Spec & Application of these techniques

RADIO ISOTOPE TECHNIQUE

Nature of radio activity
Detection and measurements of radioactivity
Applications in biological science
Safety Aspects

MANOMETRIC TECHNIQUES

Types of manometry
Warburgs constant volume
Oxygen electrode
Applications

IMMUNOLOGICAL TECHNIQUES

Introduction
Production of antisera and precipitation reaction
Precipitation in free solution
Precipitation in gel immuno diffusion
RIA
ELISA
Immuno fluorescence

MICROBIAL ASSAY TECHNIQUE FOR VITAMINS

Thiamin, Niacin, Riboflavin, Mutant methodology and its application.

STATISTICAL METHODS

Basic concepts, Law of chance, probability, mean, SD, binomial expression, hardy Weinberg law, Test analysis of variance, co-efficient of correlation.