Course Code	Title		
21PGMBC311	Paper XI – Biostatistics and Research Methodology		
Semester: III	Credits: 4	CIA : 50 Marks	ESE: 50 Marks

Course Objective:

Students can have knowledge about designing the research project and various statistical applications in Research

Course Outcome:

On successful completion of this course the students will be able to

CO 1	Know about various statistical applications in research.
CO 2	Get the knowledge of Plagiarism and research ethics
CO 3	Understand the knowledge of project design, processing and presentation of research data
CO 4	Understand the basic ideas of significant test and its hypothesis
CO 5	Analyze the types and significance of research

Offered by: Microbiology

Course Content **Instructional Hours/ Week: 5**

Unit	Description	Text Book	Chapter
I	**Definition** – Scope of Biostatistics, Probability analysis, Variables in Biology-Collection, Classification and Tabulation of data. Graphical and diagrammatical representation –Scale diagram - Histogram- frequency curve	2	1-3, 5-6
		Instructional Hours	**15**
II	**Measures of central tendency** - Arithmetic mean, Median, Mode. Calculation of Mean, median, Mode in series of individual observations, discrete series, continuous, open end classes, measure of dispersion, standard deviation, standard error.	2	7-8
		Instructional Hours	**15**
III	**Simple correlation coefficient**, correlation regression- simple and linear	2	10,11
		Instructional Hours	**15**
IV	**Basic ideas of significant test**-Hypothesis testing, Level of significant test, test based on studies-t-test- chi square, Goodness of fit.	2	3-5
		Instructional Hours	**15**
V	**Research Methodology** – Types of Research- Significance of Research. Research Problem - Selection of research problem – Formulation of research objectives - project design - review of literature writing	1	1-3
		Instructional Hours	**15**
		Total Hours	**75**

Text Book(s):

1. Gupta.S.P. **Statistical Methods**. Sulthan Chand and Sons. 2012.
2. Kothari. **Research Methodology: Methods and Techniques**. New Age International Pubishers. New Delhi. 2004.

Unit I: Text Book 2 Chapter 1-3,5-6:27-39
Unit II:Text Book 2 Chapter 7-8: 79-118
Unit III: Text Book 2 Chapter 10-11: 175-199

Unit IV: Text Book 2 Chapter 3-5: 201-262
Unit V: Text Book 1 Chapter 1-3: 289-386

Reference Book(s):

1. S.C. Guptha and V. K. Kapoor. **Fundamentals of Mathematical Statistics**. Sulthan Chand and Sons. 11th Edition. 2002.
2. Sokal, R.R. and Rohlf, F.J. An **Introduction to Biostatistics**. W.H. Freeman and Company.1987.
3. Research Methodology (cusb.ac.in)
4. Biostatistics & Research Methodology--PharmD Notes ~ Revolution PharmD

Tools for Assessment (50 Marks)

CIA I	CIA II	CIA III	Assignment	Seminar	Quiz	Total
8	8	10	8	8	8	50

Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	H	L	M	M	M	L	H	L	M	L	L	H
CO2	M	H	M	L	H	H	M	H	L	L	L	L	H
CO3	M	H	H	L	H	H	M	H	L	L	L	L	H
CO4	H	L	H	M	M	M	M	M	L	L	L	L	H
CO5	H	H	M	L	H	H	L	H	L	H	L	L	H

H – High; M- Medium; L - Low

Course Designed by	Verified by HOD	Checked by	Approved by
30/3/22 M. DHANALAKSHMI	P. CHANDRAPUSHPAM	Convenor CDC	30 MAR 2022

Course Code	Title		
18PGFNC312	Paper XII - Research Methodology and Statistics		
Semester : III	Credits : 4	CIA : 25 Marks	ESE : 75 Marks

Course Objective : To

1. Understand the principles and methods of research
2. Apply statistical procedure to analyse numerical data and draw inferences.

Course Outcomes :

CO1	Distinguish between research objectives, hypothesis, research tools and research design
CO2	Summarize the ethical issues in quantitative and qualitative educational research
CO3	Use effective tools and techniques for data collection and analysis of data
CO4	Critically evaluate the methodological designs and select appropriate analytical strategies for their research projects.
CO5	Apply relevant statistical analysis for quantitative and quantitative research

Offered by: Food Science and Nutrition

Course content **Instructional Hours / week: 5**

Unit	Descriptions	Text Book	Chapter number
I	**Research types and sampling methods:** Meaning of research, objectives of research, types of research and their application, selection and formulation of research problems, hypothesis, designing a research — different types, census and sample method, theoretical basis of sampling, sampling methods — random sampling methods and non-random sampling methods, size of sample, sampling and nonsampling errors.	1	1
	Instructional hours		**15**
II	**Methods of Collecting Primary Data:** Questionnaire, preparation of schedules, interview method, case study method, experimentation method, sources of secondary data, precautions while using secondary data. **Editing and Coding the Data Organization of Data** – Classification – meaning and objectives, types of classification, formation of discrete and continuous frequency distribution, tabulation – role, part of a table, general rules of tabulation, types of tables.	1	4
	Instructional hours		**15**
III	**Representation of Data:** Diagrammatic and graphical representation – significance of diagrams and graphs – general rules for constructing diagrams – types of diagrams, graphs of time series, graphs of frequency distribution. **Interpretation and Report Writing** – Meaning of interpretation, technique, precautions, format of research report, types, steps and stages, mechanism and style, precautions and essentials for good report, footnotes and bibliographical citations.	1	5
	Instructional hours		**15**

IV	**Measures of Central Tendency:** Mean, median, mode, their relative advantages and disadvantages. Measures of dispersion — mean deviation, standard deviation, quartile deviation. Co-efficient of variation, percentile and percentile ranks. Association of attributes, contingency tables, correlation, coefficient of correlation and its interpretation, rank correlation, regression equations and predictions.	3	4
	Instructional hours		**15**
V	**Probability** – Rules of probability and its applications. Distribution – normal, binomial, their properties, importance of these distributions in statistical studies. Tests of significance – large and small samples, _t' and _F' test, tests for independence using chi-square test. Analysis of variance – one-way and two-way classification.	1	6
	Instructional hours		**15**
	Total instructional hours		**75**

Text Books :

1. Kothari, C.R. Research Methodology: Methods and Techniques, New age International Publications, 4th Edition, 2018
2. Gupta, S.F., Statistical Methods, Sultana Chand and Sons, 3l Revises Edition, 2002
3. Ramakrishnan, P., Biostatistics, Sara Publication, 2001.
4. Shanthi Sophia Bharathi, Computer Oriented Statistical Methods / Probability and Statistics, Chanilatha Publications, Second Edition, 2000.
5. Donald, H. Mc. Burney, Research Methods, Fifth Edition, Thomson and Wadsworth Publications, 2002

Tools for Assessment (25 marks)

CIA I	CIA II	CIA III	Assignment	Seminar	Group activity	Total
5	5	6	3	3	3	25

Mapping

PO / CO	PO1	PO 2	PO3	PO4	PO5
CO1	L	H	M	L	L
CO2	L	H	M	L	L
CO3	L	H	M	M	M
CO4	L	H	L	L	M
CO5	L	H	L	L	M

H-High; M-Medium; L-Low

Prepared by	Verified by	Checked by	Approved by
14/8/21	14/8/21	Convener CDC	14 AUG 2021