

THE GANDHIGRAM RURAL INSTITUTE – DEEMED UNIVERSITY
(Re-Accredited by NAAC with ‘A’ Grade – 3rd Cycle)

DEPARTMENT OF APPLIED RESEARCH

Other Department Programmes: Curriculum

Course Code	Title of the Course	No. of Credits	Hours/Week	Evaluation (% Marks)		Total Marks
				CFA	ESE	
17APRM0001	Research Methodology	4	4	50	50	100
17APRP0001	Research Methods	4	4	40	60	100
17APRP0002	Applied Statistics	4	4	40	60	100
17APRP0101	Research Methods and Statistics	4	4	40	60	100
17APRP0004	Bio – Statistics	4	4	40	60	100
17APRU0001	Elements of Research Methods	3	4	40	60	100
17APRU0002	Elements of Research Methods and Statistics	3	4	40	60	100
17APRP02N1	Introduction to Labour Studies	4	4	40	60	100

Ph.D/M.Phil/M.Tech. Programmes
[Micro Level Planning/Development Sociology/Development
Administration/Economics/Energy/Food Science and Nutrition]

RESEARCH METHODOLOGY
(Course Code - 17APRM0001)

Credit: 4
Contact hours: 64

Max. Marks: 100
[CFA-50, ESE-50]

Objectives

To develop expertise and skills to undertake independent research in the area of specialization and application of statistical tools

Specific Objectives of Learning: Upon completion of the course, the scholars will be able to:

- identify and formulate a problem for research.
- prepare suitable research design, choose appropriate tools and techniques of data collection
- process the data collected and do analysis using appropriate statistical methods
- write research report independently and professionally

Syllabus

Unit - 1: Scientific Research – methods of acquiring knowledge - Inductive and Deductive Reasoning, scientific method and its applications. Research Process: Selection of problem for Research, review of literature, formulation of Hypotheses, nature and types of Variable.

Unit - 2: Research Design and Methods: Purpose and preparation of research design. Types of research design – Historical, Descriptive, and Experimental. Field surveys, diagnostic and evaluation research. Qualitative and quantitative methods, problem-solving, development and interdisciplinary research.

Unit - 3: Tools and techniques of data collection – Observation, interview, Inquiry Forms, Psychological tests, Projective techniques, rating scales, Likert and Thurstone, Guttman type scales. Sociometry, Focus Group discussion, and PRA Validity, reliability and feasibility. Structure and qualities of a Research Report, Dissemination of research findings, Evaluation of Research Report.

Unit - 4: Data Analysis – Categorization, Presentation of data: Diagrams and Frequency distributions. Central measures, Dispersion measures, Skewness and kurtosis. Correlation and regression analysis, multiple correlation and regression, Factor analysis, and Discriminant analysis.

Unit - 5: Testing of Hypothesis and Tests of Significance: Basics and steps in hypothesis testing; Concept of Sampling distribution and Standard Error. Sampling and Data Collection: Probability and non-probability sampling techniques, sampling and non-sampling errors. Statistical Tests – large and small sample tests, Chi-square test, ANOVA.

REFERENCES

- Aggarwal.Y.P, *Statistical Methods: Concepts, Applications and Computations*, New Delhi: Sterling Publishing Company, 1988.
- Arun Kumar Singh, *Tests, Measurements and Research Methods in Behavioural Sciences*, New Delhi: Tata McGraw Hill, 1986.
- BritahaMikkelson, *Methods for Development Work and Research and a Guide for Practitioners*. New Delhi: Sage Publications, 1995.
- Dooley, David, *Social Research Methods*, New Delhi: Prentice Hall, 1996.
- Dwivedi.R.S, *Research Methods in Behavioral Sciences* Delhi: Macmillan, 1997.
- Runyon.R.Petal, *Fundamentals of Behavioural Statistics*, New Delhi: McGraw Hill, 1996.

TEXT BOOKS

- Garrett.H.E, *Statistics in Psychology and Education*, Bombay: Vakils, Feffer and Simons, 1981.
- Kerlinger.N, *Foundations of Behavioural Research*, Delhi: Surjeet Publications, 1983.
- KuttanMahadeven and Parameswara Krishnan, *Methodology for Population Studies and Development*. New Delhi: Sage Publications, 1993.
- Vijayalakshmi.G and Sivapragasam.C, *Research Methods: Tips and Techniques*, Chennai: MJP Publishers, 2009.

P.G. Programmes

[Human Resource & Conflict Management/ Development Administration/Economics
Home Science/Food Science and Nutrition/Dairy Science]

RESEARCH METHODS

(Course Code- 17APRP0001)

Credit: 4
Contact hours: 64

Max. Marks: 100
(ESE 60, CFA: 40)

Objectives

- To enable the students to understand the basics of research methodology, and
- To develop skill among the students to prepare professional research report

Specific Objectives of Learning: Upon completion of the course, the students will be able to:

- identify and formulate a problem for research.
- prepare suitable research design to study the research problem to be formulated
- choose appropriate methods of sampling, tools and techniques of data collection
- process the data collected in the field and analyze it using appropriate statistical methods
- prepare research report in a professional manner.

Syllabus

Unit - 1: Scientific Research – characteristics and functions of research, scientific method, steps in research. Types of research: Pure, Applied and Action Research, Qualitative and Quantitative studies. Research Aptitude, skills and ethics.

Unit - 2: Research Process – Formulation and selection of research problem, statement of the problem and definition of terms, objectives, review of literature. Variables - Hypotheses – characteristics and functions – preparation of research design.

Unit - 3: Methods of Research – Exploratory, descriptive and experimental designs, surveys, content analysis, case study, participatory and interdisciplinary studies, mixed methods.

Unit - 4: Data Collection – Sources and types of data – Data base - conduct of Interview, observation, schedule and questionnaire. Sociometry. Psychological test – projective techniques, Online research methods – types of scales, Pre test, reliability and validity.

Unit - 5:Report Writing – Research Report – format - types of reports - Reference materials, bibliography, footnotes, glossary, index and appendix - Plagiarism–dissemination of research findings.

REFERENCES

- Bandarkar and Wilkinson, *Methods and techniques of Social Research*, Bombay: Himalaya Publishing Co, 2006.
- Donald H.McBurney, *Research Methods*, New Delhi: Library of Congress Cataloging-in-Publication, 2003
- Goode and Hatt, *Methods in Social Research*, New Delhi: McGraw Hill, 2002.
- John.W.Creswell, *Research Design: Qualitative and Quantitative Approaches*, New Delhi: Sage Publication, 1994.
- Kothari.C.R, *Research Methodology*, New Delhi: VishvaPrakashan, 2001.

TEXT BOOKS

- Tim May, *Social Research Issues: Methods and Process*, Buckingham:Open University Press,2001
- Tony Brown and Liz Jones, *Action Research and Postmodernism*, Buckingham: Open University Press, 2001
- William M.K, *Research Methods*, New Delhi: Atomic Publishing, 2003.
- Young.P.V, *Scientific Social Surveys and Research*, New Delhi: Practice Hall, 1994.
- Vijayalakshmi.G. andSivapragasam.C, *Research Methods: Tips and Techniques*, Chennai: MJP Publishers, 2009.

P.G. Programmes

[Human Resource & Conflict Management/Economics/Development Administration
/Home Science/Food Science and Nutrition/Dairy Science]

APPLIED STATISTICS

(Course Code -17APRP0002)

Credit: 4

Contact hours: 64

Max. Marks: 100

(ESE 60, CFA: 40)

Objectives

- To enable students to understand the basics and uses of statistics in their field of study
- To enable students familiar with various statistical methods that are required for the analysis of data in their field of study; and
- To develop skills among students to analyze data using appropriate statistical tools;

Specific Objectives of Learning: Upon completion of the course, the students will be able to:

- be familiar with the basic concepts and terminology of statistics;
- understand the importance and application of statistics in different disciplines
- choose appropriate sampling procedure and decide sample size.
- develop skill in reading and understanding the results from data analysis
- able to demonstrate competence in analyzing statistical data using SPSS.

Syllabus

Unit - 1: Statistics: Definition, scope, functions and limitations, Statistical Organizations and Set up in India and Tamil Nadu

Unit - 2: Sources and types of data, Coding and classification, Tabulation and presentation of data – Frequency distribution, Diagrammatic and Graphical presentation.

Unit - 3: Sampling Techniques: Census Vs sampling, characteristics of a good sample, sampling size and sampling error. Probability samples – simple random, stratified random, systematic cluster, multi stage sampling. Non-probability samples – accidental, purposive, judgement, convenient, volunteer, snow ball sampling.

Unit - 4: Descriptive Statistics – Central Measures, Variability measures, Skewness and Kurtosis, Measures of association, Coefficient of correlation, coefficient of determination, coefficient of Association and Regression analysis.

Unit - 5: Inferential Analysis – Testing of hypothesis, basics and steps in hypothesis testing – Concept of sampling distribution and standard error. Parametric and non-parametric tests - Students 't' test and 'z' test, 'F' test, Chi-square test; Statistical analysis using Statistical software.

REFERENCES

- Agarwal,Y.P,*Statistical Methods*, New Delhi: Sultan Chand and Sons, 1996.
- Blalock.H.M, *Social Statistics*, New Delhi: McGraw Hill, 1979.
- Gupta,S.P and Gupta.M.P, *Business Statistics*, New Delhi: Sultan Chand and Sons, 2006.
- Hawley, Warren, *Foundations of Statistics*, New York: Saunders College Publishing, 1996.
- Hooda.R.P, *Statistics for Business and Economics*, New Delhi: Macmillan, 2003.
- Kothari.C.R,*Quantitative Techniques*, New Delhi:Vikas Publishing House, 1998.

TEXT BOOKS

- Gupta, S.C. *Fundamentals of Statistics*, Mumbai: Himalaya Publishing House, 2006.
- Rajamanickam.M, *Statistical Methods in Psychological and Educational Research*, New Delhi: Concept Publishing Company, 2001.
- Siegel, Sidney, *Non-Parametric Statistics for Behavioural Sciences*, New Delhi: McGraw Hill, 2006.
- Sinha B.L, *Statistics in Psychology and Education*, New Delhi: Anmol Publications,2006.
- Vijayalakshmi.G and Sivapragasam.C, *Research Methods: Tips and Techniques*, Chennai: MJP Publishers, 2009.

P.G. Programmes
[Sociology/Rural Development/Geo-informatics/

RESEARCH METHODS AND STATISTICS
(Course Code- 17APRP0101)

Credit: 4
Contact hours: 64

Max. Marks: 100
(ESE 60, CFA: 40)

Objectives

- To enable the students understand the basics of research methodology, and
- To develop skill in preparing research report

Specific Objectives of Learning: Upon completion of the course, the students will be able to:

- identify and formulate a problem for research.
- prepare suitable research design to study a research problem to be formulated
- choose appropriate methods of sampling, tools and techniques of data collection
- process the data collected in the field and to analyse using appropriate statistical methods
- prepare research report in a professional manner.

Syllabus

Unit - 1: Introduction: Research – definition, objectives, functions. Characteristics of Scientific Research. Types of Research: Pure, Applied and Action Research. Steps in Research – Identifying and Selection of Research problems - theoretical framework – review of literature, Variables -its types– Hypothesis – formulation and types. Research aptitude, skills, and ethics – Plagiarism.

Unit - 2: Research design: Explorative; Experimental, descriptive, Case study and survey methods. Content Analysis, Intervention and Interdisciplinary Studies, Mixed methods. Sampling and non-sampling techniques. Pilot Study and Pre-test.

Unit - 3: Data collection methods: Types and sources of data, Interview, schedule, Questionnaire, and observation. Online research methods, psychological tests, projective techniques, sociometry. Scales techniques – Test of validity and reliability - Research Report - Components and format of research report - Reference materials, quotations, bibliography, footnotes, glossary and appendix, dissemination of findings.

Unit - 4: Descriptive Analysis: Measures of central tendency, dispersion, skewness and kurtosis – Correlation of Analysis, Association of attributes Multiple regression and correlation analysis, concepts of Factor analysis. Statistical software and its uses.

Unit - 5: Inferential Analysis: Basic concepts and Hypothesis testing and Estimation; Steps in hypothesis testing. Tests for Large and small samples – Z test, t-test and F-test, Chi-square test, Mann-Whitney test, and ANOVA

REFERENCES

- Beri G.C, *Marketing Research*, New Delhi: Tata McGraw-Hill Publishing Company Limited, 2000.
- Donald.R.Cooper and Ramela. S. Schindler, *Business Research Methods*, New Delhi: Tata McGraw Hill Publishing Company Limited, 2000.
- Gupta S.P and M.P.Gupta, *Business Statistics*, New Delhi: Sultan Chand and Sons, 2006.
- Hooda R.P, *Statistics for Business and Economics*, New Delhi: Macmillan Ltd., 2003.
- Kothari.C.R, *Research Methodology*, New Delhi: Wishva Prakashan, 2001.

TEXT BOOKS

- Krishnaswamy.O.R, *Methodology of Research in Social Sciences*, Bombay: Himalaya Publishing House, 2002.
- Shajahan.S, *Research Methods for Management (Text and Cases)*, New Delh: Jaico Publishing House, 2006.
- Uma Sekaran, *Research Methods for Business*, New York: John Wiley and Sons Inc., 2000.
- Vijayalakshmi.G. and Sivapragasam.C, *Research Methods: Tips and Techniques*, Chennai: MJP Publishers, 2009.

M.Sc Micro Biology/Botany/Zoology

BIO-STATISTICS

(Course Code - 17APRP0004)

Credit: 4
Contact hours: 64

Max. Marks: 100
(ESE 60, CFA: 40)

Objectives

- Students will be able to make informed decisions based on data and apply statistical tools and techniques in their research works

Specific Objectives of Learning: Upon completion of the course, the students will be able to:

- be familiar with statistics and its applications in biology
- solve problems quantitatively using appropriate statistical measures
- create and interpret visual representations of quantitative information
- understand and critically assess data collection and its representation
- understand various rates, ratios and odds ratio

Syllabus

Unit-1: Introduction to Bio-Statistics - Development of Biostatistics and its applications - Sources of biological data - Secondary and Primary sources - Classification and tabulation of data - frequency distribution -Diagrammatic and Graphical representation of statistical data.

Unit-2: Sampling- meaning, advantages, concept of parameter and statistics, sample size, sampling error, sampling frame, Types of samples - Probability and non-Probability samples - Purposive sampling, Convenience sampling, Judgement sampling. Reliability of samples.

Unit-3: Descriptive Statistics - Measures of central tendency - Mean, Median, Mode - Measures of Dispersion: -Range, and standard deviation, absolute and relative measures of dispersion. Skewness and kurtosis measures.

Unit- 4: Correlation and Regression Analysis - Definition, uses, types of correlation, Regression Lines – Properties of regression lines and coefficients; Introduction to probability and its applications – Theoretical Distributions – Binomial, Poisson and Normal distributions; Properties, uses and applications.

Unit-5: Inferential Statistics and Biological Measures: Hypothesis testing and Tests of significance - Test of attributes, small and large sample tests - Analysis of variance – one-way and two-way classifications; Measurement of risk, odds ratio and Bio-assay and dose responses and dose responses.

REFERENCES

- Arora.P.N. and Malhan.P.K, *Biostatistics*, Delhi: Himalaya Publishing House, 1996.
- Daroga Singh, Chaundjari.F.S, *Theory and Analysis of Sample Survey*, New Delhi; Wiley Eastern Ltd., 1986.
- Gupta. C.B, *An Introduction to Statistical Methods*, New Delhi: Vikas Publishers, 1992.
- Gupta. S.P, *Statistical Methods*, New Delhi: Sultan Chand, 1992
- Gurumani.N, *An Introduction to Biostatistics*, Chennai: MJP Publishers, 2004.

TEXT BOOKS

- Sampath Kumar.V.S, *Bio-Statistics*, Tirunelveli: Manonmaniam Sundaranar University Publication, 1997.
- Verma B.L, Shukla G.D and Srivastava.R.N, *Biostatistics – Perspectives in Health Care; Research and Practice*, New Delhi: CBS Publishers & Distributors, 1993.
- Vijayalakshmi.G. and Sivapragasam.C, *Research Methods: Tips and Techniques*, Chennai: MJP Publishers, 2009.

U.G. PROGRAMMES
(B.Com/BBA/B.A.GSW)

Course: Elements of Research Methods
(Course Code – 17APRU0001)

Credit: 3
Contact hours: 48

Max. Marks: 100
(ESE 60, CFA: 40)

Objective

To understand the basics, methods and procedures of research, and acquire knowledge in data analysis.

Specific Objectives of Learning: Upon completion of the course, the students will be able to:

- identify and formulate a problem for research.
- choose the appropriate tools and techniques of data collection
- prepare a suitable research design to carryout research
- learn different methods of sampling
- write research report to suit their purpose

Syllabus

Unit - 1: Research – Definition, objectives, characteristics and types of research - Steps in research – Selection of problem for research – Sources of review of literature – Hypothesis: concept and characteristics

Unit - 2: Research Design – Need and components of research design, Methods of research – experimental, descriptive, explorative studies, case study, and survey.

Unit - 3: Data Collection – Sources of data, Data Collection tools and techniques – observation, interview, schedule, and questionnaire. Pilot study and Pre test. Research Report – Types of research report – Format of a research report.

Unit - 4: Sample Vs Census methods: Sampling methods, Processing of Data – scoring, coding, classification and tabulation of data, diagrammatic, and graphical presentation.

Unit - 5: Data Analysis –Measure of central tendency - mean, median and mode; Measures of dispersion – Range, Variance, Standard Deviation - Correlation and regression analysis, and Uses of Software in data analysis.

REFERENCES

- Basotia.G.R and Sharma K.K, *Research Methodology*, Jaipur: Mangal Deep Publications, 1999.
- Gosh.B.N, *Scientific Methods and Social Research*, New Delhi: Sterling Publishers, 1997.
- Gupta.S.C, *Fundamentals of Statistics*, Mumbai: Himalaya Publishing House, 2006.
- Hans Raj, *Theory and Practice in Social Research*, Delhi: Surjeet Publications, 2002.
- Kothari.C.R, *Research Methodology*, New Delhi: VishvaPrakashan, 2001.

TEXT BOOKS

- Krishnaswami.O.R. andM.Ranganatham, *Methodology of Research in Social Sciences*, Mumbai: Himalaya Publishing House, 2010.
- Manoharan.M, *Statistical Methods*, Palani: Paramount Publishers, 1997.
- Nakkiran.SandSelvaraju.R, *Research Methods in Social Sciences*, Mumbai: Himalaya Publishing House, 2001.
- Sadhu.A.N. andSingh.A, *Research Methodology in Social Sciences*, Mumbai: Himalaya Publishing House, 2005.
- Vijayalakshmi.G. andSivapragasam.C, *Research Methods: Tips and Techniques*, Chennai: MJP Publishers, 2009.

B.Tech. (Civil Engineering)

Elements of Research Methods and Statistics

(Course Code – 17APRU0002)

Credit: 3
Contact hours: 48

Max. Marks: 100
(ESE 60, CFA: 40)

Objectives

- To enable the students understand the basics of research methodology and
- To develop skill in preparing research report

Specific Objectives of Learning: Upon completion of the course, the students will be able to:

- identify and formulate a problem for research.
- prepare suitable research design to study a research problem to be formulated
- choose appropriate methods of sampling, tools and techniques of data collection
- process the data collected in the field and to analyze using appropriate statistical methods
- prepare research report in a professional manner.

Unit - 1: Introduction: Scientific Research – definition, objectives, and characteristics. Types of Research: Pure, Applied and Action Research. Steps in Research – Identifying and Selection of Research problems-Review of literature, Variables-its types–Hypothesis–formulation and types.

Unit - 2: Research design: Explorative; Experimental, descriptive, Case study and survey methods. Content Analysis, Intervention and Interdisciplinary Studies, Mixed methods. Sampling techniques. Pilot Study and Pre-test.

Unit - 3: Data collection methods: Types and sources of data, Interview, schedule, Questionnaire, and Observation. Research Report - Types and format of research report - Reference materials, bibliography, glossary and appendix, dissemination of findings.

Unit - 4: Descriptive Analysis: Measures of central tendency, dispersion, skewness and kurtosis – Correlation of Analysis, Association of attributes. Multiple regression and correlation analysis. Statistical software and its uses.

Unit - 5: Inferential Analysis: Tests of Significance and Hypothesis testing: Basic concepts; Steps in hypothesis testing. Tests for Large and small samples – Z test, t-test and F-test, Chi-square test and ANOVA

REFERENCES

- Beri G.C, *Marketing Research*, New Delhi: Tata McGraw-Hill Publishing Company Limited, 2000.
- Donald.R.Cooper and Ramela.S.Schindler, *Business Research Methods*, New Delhi: Tata McGraw Hill Publishing Company Limited, 2000.
- Gupta S.P and M.P.Gupta, *Business Statistics*, New Delhi: Sultan Chand & Sons, 2006
- Hooda.R.P, *Statistics for Business and Economics*, New Delhi: Macmillan Ltd., 2003.
- Kothari.C.R, *Research Methodology*, New Delhi: Wishva Prakashan, 2001.

TEXT BOOKS

- Krishnaswamy.O.R, *Methodology of Research in Social Sciences*, Bombay: Himalaya Publishing House, 2002.
- Shajahan.S, *Research Methods for Management (Text and Cases)*, New Delhi: Jaico Publishing House, 2006.
- Uma Sekaran, *Research Methods for Business*, New York: John Wiley and Sons Inc., 2000.
- Vijayalakshmi.G and Sivapragasam.C, *Research Methods: Tips and Techniques*, Chennai: MJP Publishers, 2009.