BMA-CSA01

ALLIED MATHEMATICS-I

Credits: 5

Year: I/II, Sem:I/III

LEARNING OUTCOMES:

• Students gain knowledge about basic concepts of Algebra, Theory of Equations, Matrices, Trigonometry and Calculus.

UNIT I

Algebra And Numerical Methods:

Algebra: Summation of series - simple problems.

Numerical Methods: Operators E,Δ,∇ , difference tables- Newton-Raphson method- Newton's forward and backward interpolation formulae for equal intervals, Lagrange's interpolation formula.

Chapter 2, Section 2.1.3, 2.2, 2.2.1, 2.3, 2.3.3 Chapter 3, Section 3.4.1 and Chapter 5, Section 5.1 and 5.2.

UNIT II

Matrices: Symmetric, Skew-Symmetric, Orthogonal, Hermetian, Skew-Hermetian and Unitary matrices. Eigen values and Eigen-vectors, Cayley-Hamilton theorem (without proof) – verification- Computation of inverse of matrix using Cayley - Hamilton theorem. Chapter 4, Section 4.1.1 to 4.1.6, 4.5, 4.5.2, 4.5.3.

UNIT III

Theory Of Equations: Polynomial equations with real coefficients, irrational roots, complex roots, symmetric functions of roots, transformation of equation by increasing or decreasing roots by a constant, reciprocal equation-simple problems.

Chapter 3, Section 3.1 to 3.4.1(omit section 3.2.1)

UNIT IV

Trigonometry: Expansions of $\sin(n\theta)$ and $\cos(n\theta)$ in a series of powers of $\sin\theta$ and $\cos\theta$ - Expansions of $\sin^n\theta$, $\cos^n\theta$, $\tan^n\theta$ in a series of sines, cosines and tangents of multiples of " θ " - Expansions of $\sin\theta$, $\cos\theta$ and $\tan\theta$ in a series of powers of " θ " – Hyperbolic and inverse hyperbolic functions.

Chapter 6, Section 6.1 to 6.3.

UNIT V

Differential Calculus:Successive differentiation, nth derivatives, Leibnitz theorem (without proof) and applications, Jacobians, Curvature and radius of curvature in Cartesian co-ordinates, maxima and minima of functions of two variables- Simple problems

Chapter 1, Section 1.1 to 1.3.1 and 1.4.3.

Content and treatment as in

Allied Mathematics, Volume I and II, by P. Duraipandian and S. Udayabaskaran, S. Chand Publications

Reference:-

- 1. S. Narayanan and T.K. Manickavasagam Pillai Ancillary Mathematics, S. Viswanathan Printers, 1986, Chennai.
- 2. Allied Mathematics by Dr. A. Singaravelu, Meenakshi Agency.

e-Resources:

- 1. http://www.themathpaage.com
- 2. http://nptel.ac.in

BST-CSA01

ALLIED STATISTICS-I

Credits: 5

Year: I/II, Sem:I/III

Learning Outcomes: Upon finishing this course, students will be able to

- 1. Know the uses of statistics in society
- 2. Organize, manage and present data
- 3. Analyze the statistical data graphically using frequency distribution and cumulative frequency distribution.
- 4. Analyze statistical data using measures of central tendency, dispersion and location.
- 5. To understand correlation between continuous variables and association between categorical variables.

Course Content:

UNIT-I: Methods of collection: Complete enumeration – Sample Survey - Primary data - Secondary data sources - Types of variables. Norminal, ordinal and scale data. Presentation of Data: Presentation of data by tables - construction of tables (Univariate and Bivariate) – frequency table and contingency table

UNIT-II: Diagrammatic presentation: Line diagram, Bar diagrams: Simple, multiple, subdivided and Percentage-Pie chart, comparative pie chart - Graphical representation of a frequency distribution by histogram and frequency polygon and Ogives

UNIT-III: Analysis of Data (Univariate): Measures of central tendency: Arithmetic mean-Median and Mode choice of an average-characteristic of a good average.

UNIT-IV: Measures of dispersion: Range-Quartile deviation-mean deviation - standard deviation - relative measures of dispersion - Coefficient of Variance

UNIT-V: Analysis of Data (Bivariate): Correlation- Scatter plot-coefficient of correlation-Pearson's Correlation Coefficient, Spearmen's rank correlation coefficient-correlation coefficient for bivariate frequency table- Association of attributes: Chi-square test of independence of attributes

Suggested Readings:

Books for study:

- 1. Gupta, S.C and Kapoor, V. K (2002), *Fundamentals of Mathematical Statistics*, Sultan Chand and Sons, New Delhi.
- 2. Goon A.M., Gupta M.K. and Dasgupta B. (2002): *Fundamentals of Statistics*, Vol. I & II, 8th Edn. The World Press, Kolkata.
- 3. Irwin Miller, Marylees Miller (2006): John E. Freund's Mathematical Statistics with Applications, (7th Edn.), Prentice Hall International INC.
- 4. Mood, A.M. Graybill, F.A. and Boes, D.C. (2007): *Introduction to the Theory of Statistics*, 3rd Edn., (Reprint), Tata McGraw-Hill Pub. Co. Ltd

Books for reference:

1. Saxena H.C.: *Elementary Statistics*. S. Chand & Co., 2009.

UNIVERSITY OF MADRAS B.Com. (GENERAL) DEGREE COURSE SYLLABUS WITH EFFECT FROM 2020-2021

BGE-CSA3A

ALLIED-III(A): BUSINESS STATISTICS

Common to BCom(A&F), BCom(CS), BCom(BM),BCom(MM), B.Com(Co-op), BCom(CA) & BCom(ISM)

Inst.Hrs: 6

Credits : 5

YEAR: II SEMESTER: III

OBJECTIVES

To Facilitate Understanding Relevance and Need Of Statistics in Current Scenario

• To Customize the Importance of Business Statistics for the Commerce Students

UNIT-I Introduction

Meaning and Definition of Statistics- Collection and Tabulation of Statistical Data-Presentation of Statistical Data-Graphs and Diagrams

UNIT-II Measures of Central Tendency and Measures of Variation

Measures of Central Tendency- Arithmetic Mean, Median, Mode, Harmonic Mean and Geometric Mean. Measures of Variation- Standard Deviation -Mean Deviation- Quartile Deviation-Skeweness and Kurtosis- Lorenz Curve

UNIT-III Correlation and Regression Analysis

Simple Correlation-Scatter Diagram- Karl Pearson's Correlation- Spearman's Rank Correlation- Regression- Meaning-Linear Regression.

UNIT- IV Time Series

Analysis of Time Series-Causes of Variation in Time Series Data -Components of Time Series- Additive and Multiplicative Models- Determination of Trend By Semi Average, Moving Average and Least Square(Linear Second Degree And Exponential) Methods-Computation of Seasonal Indices By Simple Average, Ratio to Moving Average, Ratio to Trend and Link Relative Methods

UNIT-V Index Numbers

Meaning and Types of Index Numbers-Problems in Construction of Index Numbers-Methods of Construction of Price and Quantity Indices- Test of Adequacy- Errors in Index Numbers- Chain Base Index Numbers- Base Shifting -Splicing -Deflation -Customer Price Index and Its Uses- Statistical Quality Control

SUGGESTED READINGS

- 1. Dhingra IC & MP Gupta, Lectures In Business Statistics, Sultan chand and Sons, New Delhi 2009
- 2. Gupta SP and Archana Agarwal, Business Statistics (Statistical Methods) Sultan chand and Sons, New Delhi, 9th Edition 2013
- 3. Gupta SC, Fundamentals of Statistics, Himalaya Publishing House
- 4. Richard Levin and David Rubin, Statistics for Management, Prentice Hall Of India, New Delhi, 2011,7th Edition
- 5. Sharma J K,Fundamentals of Business Statistics, Second Edition, Vikas Publishing House Private Limited,2013
- 6. Siegel, Andrew, Practical Business Statistics, Irwin Mcgraw Hill International Edition 4th
- 7. Rajagopalan SP and Sattanathan R B Business Statistics and Operations Research, Vijay Nicole Imprint Private Limited, Chennai

UNIVERSITY OF MADRAS B.B.A. DEGREE COURSE IN BUSINESS ADMINISTRATION SYLLABUS WITH EFFECT FROM 2020-2021

BBA-DSA03

ALLIED-III: BUSINESS STATISTICS

CREDITS:5

III SEM/II YEAR

Learning Objectives :

- 1. To familiarize students statistics and its role in business
- 2. To know the statistical tools and its usage for business.

UNIT I

Introduction – Meaning and Definition of Statistics – Collection and Tabulation of Statistical Data – Presentation of Statistical Data – Graphs and Diagrams- Measures of Central Tendency – Arithmetic Mean, Median and Mode – Harmonic Mean and Geometric Mean.

UNIT II

Measures of Variation – Standard Deviation – Mean deviation – Quartile deviation- Skewness and kurtosis – Lorenz Curve –Simple Correlation – Scatter Diagram – Karl pearson's Correlation – Rand Correlation – Regression.

UNITIII

Analysis of Time Series - Methods of Measuring Trend and Seasonal Variations

UNITIV

Index Numbers - Consumer Price Index - And Cost Of Living Indices- Statistical quality control

UNIT V

Sampling procedures - simple, stratified and systematic.

Reference Books:

- 1. P.R. Vittal, Business Mathematics and Statistics, MarghamPublications, Chennai, 2004.
- 2. S.P.Gupta, Statistical Methods, SultanChand&Sons, NewDelhi, 2007.
- 3. S.P. Gupta, Elements of Business Statistics, SultanChand&Sons, NewDelhi, 2007.
- 4. J.K.Sharma, Business Statistics, Pearson Education, New Delhi, 2007.
- 5. Business Statistics & OR Dr.S.P.Rajagopalan, Tata McGrawHill

UNIVERSITY OF MADRAS B.Sc. DEGREE COURSE IN PSYCHOLOGY SYLLABUS WITH EFFECT FROM 2020-2021

BPY-DSA03

ALLIED-III: STATISTICS IN PSYCHOLOGY

Instr.Hrs.: 6 Credits : 5 Year : II Semester: III

Course Learning Outcome

After completion of the Statistics in psychology course, students will be able to:

- 1. Explain the different levels of measurement and methods of organizing data in statistics
- 2. Make use of mean, median, mode and variability
- 3. Illustrate and apply the concepts of normal distribution
- 4. Find out correlation
- 5. Test for significance in hypotheses testing
- 6. Select and utilize appropriate non-parametric statistics

UNIT I: INTRODUCTION TO STATISTICS

Meaning of statistics-Importance of Statistics in Psychology –Parameters and Estimates-Descriptive Statistics- Inferential Statistics-Variables and their types; Levels of measurement: Nominal Scale- Ordinal Scale- Interval Scale- Ratio Scale; Frequency tables: Making a Frequency Table -Frequency tables for Nominal Variables- Grouped Frequency Tables, Frequency Graphs: Histogram, Frequency Polygon.

UNIT II: CENTRAL TENDENCY AND VARIABILITY

Central Tendency: The Mean- from Frequency Distributions - Assumed Mean Method-Properties of Mean. Median – Calculation of Median from Ungrouped data- Calculation of Median from a Frequency Distribution. The Mode- Calculation of Mode in a Frequency Distribution.Comparison of Mean, Median and Mode- Guidelines for the Use of Central Tendencies.

Variability: the Range- Calculation of Range- the Average Deviation- Calculation of the Average Deviation. The Semi Interquartile Range- Calculation of Q1, Q3 and Quartile Deviation. The variance and the Standard Deviation- Methods of Calculating the Variance and the Standard Deviation from Ungrouped data- Calculation of Standard Deviation from Grouped data- Calculation of Standard Deviation from Assumed Mean.

UNIVERSITY OF MADRAS B.Sc. DEGREE COURSE IN PSYCHOLOGY SYLLABUS WITH EFFECT FROM 2020-2021

UNIT III: NORMAL DISTRIBUTION AND CORRELATION

The Normal Distribution: Properties of the Normal Curve- Areas under the Normal Curve-Importance of Normal Distribution- Skewness- Kurtosis- Importance of measures of Skewness and Kurtosis. The Correlation: the Concept of Correlation- the Scatter Plot- the Product Moment Correlation- Calculation of Product Moment Correlation- Spearman's Rank- Difference Correlation Co-efficient- Properties of Correlation Co-efficient.

UNIT IV: HYPOTHESIS TESTING AND INFERENTIAL STATISTICS

Hypothesis Testing: the Core logic of Hypothesis Testing –the Hypothesis Testing Process-One Tailed and Two Tailed Hypothesis Tests. Decision Errors: Type I Error- Type II Error, Inferential Statistics: t' Tests- the t' test for a Single Sample- the t' test for a Dependent Means- Assumptions of Single Sample and the t' Test for a Dependent Means. The t' test for Independent Means: the Distribution of Differences between Means- Hypothesis Testing with a 't' test for Independent Means.

UNIT V: NON-PARAMETRIC METHODS

The Chi-Square: Degrees of Freedom- Test of the Hypothesis of Normality- Calculation of the Chi-Square for 2x2 tables- Yates' Correction for Continuity- Assumptions of the Chi Square test, The Non-parametric Methods: Sign test- Assumptions and Uses of Sign Test- the Median Test- Run Test- the Kolmogrov and Smirnov Two Sample test- Precautions of the use of the Non-parametric tests.

REFERENCES

- 1. Howell, D. (2012). Statistical method for psychology. Delhi, India: Cengage Learning.
- 2. Agresti, A., &Finlay, B. (2013). *Statistical methods for the social sciences*. Hoboken, NJ: Pearson Education
- 3. Aron, A., Aron, E. N., & Coups, E. J. (2006). *Statistics for psychology*. New Delhi, India: Pearson India Education Services Pvt Ltd.
- 4. Heiman, G. (2013). *Basic statistics for the behavioral sciences*. Belmont, CA: Cengage Learning.
- 5. Bear, G., King, B.M., & Minium, E. W. (2008). *Statistical reasoning in psychology and education*. Bengaluru, India: Wiley India Private Limited.
- 6. Gupta, S.P. (1999). Statistical methods.. New Delhi, India: Sultan Chand & Sons
- 7. Garrett, H. E. (2006): *Statistics in psychology and education*. New Delhi, India: Paragon International Publishers.

WEB RESOURCES

1. http://www.edx.org/learn/statistics

					s		Marks				
Subject Code	Subject Name	Category	Category	Т	Р	0	Credits	Inst. Hour	CIA	External	Total
	Quantitative Techniques and Research Methods in Business	Core	Y	-	-	-	4	4	25	75	100
	Course Obj	ectives					1.				
C1	how probability calculations may fac	troducti cilitate t	ion hein	to j r de	prot cisi	oabi on i	lity naki	theoi ng.	ry ar	nd disc	cuss
C2	To construct a coherent research p review, research questions, ethical co	roposal	thatio	at i ns a	nclu .nd :	udes met	s an hodo	abst ology	ract, ′.	litera	ture
C3	To understand the basic statistica qualitative and quantitative data.	l tools	s fo	or a	nal	ysis	&	inte	erpre	tation	of
C4	To recognize the principles and cha	racteris	stics	s of	the	m	ıltiva	ariate	e dat	a anal	ysis
	techniques.										
C5	To become familiar with the process of drafting a report that poses a significant problem										
UNIT	Details					N H	No. of HoursCourse Objective			ırse ctives	
Ι	Introduction: Probability - Rules of probability- Probability distribution; Binomial, Poisson and Normal Distributions, their applications in Business and Industrial Problem- Baye's Theorem and its applications - Decision Making under risk and uncertainty; Maximax, Maximin, Regret Hurwitz and Laplace Criteria in Business and Decision Making - Decision tree.				17		С	1			
Π	Research Methods: Research - Definition - Research Process - Research Design – Definition- Types Of Research Design - Role of Theory in Research - Variables in Research – Objectives - Hypothesis - Types of Data; Preliminary Vs Secondary- Methods of Primary Data Collection; Survey, Observation, Experiments - Construction Of Questionnaire - Questionnaire Schedule- Validity and Reliability of Instruments - Types of Scales; Nominal, Ordinal, Interval - Types of Attitude Measurement Scales – Sampling Techniques; Probability And Non probability Techniques- Optimal Sample Size determination.				10		С	2			

	Data Preparation and Analysis: Data Preparation -				
III	Editing –Coding- Data Entry- Data Analysis- Testing Of Hypothesis Univariate and Bivariate Analysis - Parametric And Nonparametric Tests and Interpretation of Test Results- Chi-Square Test- Correlation; Karl Pearson's Vs Correlation Coefficient and Spearman's Rank Correlation- Regression Analysis - One Way and Two Way Analysis of Variance.	15	C3		
IV	Multivariate Statistical Analysis: Exploratory and Confirmatory Factor Analysis -Discriminant Analysis- Cluster Analysis -Conjoint Analysis -Multiple Regression- Multidimensional Scaling- Their Application In Marketing Problems -Application of Statistical Software For Data Analysis- SEM Analysis	09 C4			
V	Report Writing and Ethics in Business Research: Research Reports- Different Types -Report Writing Format- Content of Report- Need For Executive Summary- Chapterization -Framing the Title of the Report- Different Styles Of Referencing -Academic Vs Business Research Reports - Ethics In Research	09 C5			
	Total	60			
	Course Outcomes	00			
Course Outcomes	On completion of this course, students will; Program Outcomes				
CO1	Be able to develop problem-solving techniques needed to accurately calculate probabilities. PO1, PO2, PO6, PO		2, PO6, PO7		
CO2	Be able to devise research methods, techniques and strategies in the appropriate manner for managerial decision making and conduct research for the industry.PO4, PO6				
CO3	Be able to apply and interpret the different types of quantitative and qualitative methods of data analysis. PO4, PO6				
CO4	Be able to use multivariate techniques appropriately, undertake multivariate hypothesis tests, and draw PO4, PO6 appropriate conclusions.				
CO5	Be able to present orally their research or a summary of another's research in an organized, coherent, and compelling fashion.		4, PO6		
Reading List					
1. https://www.dartmouth.edu/~chance/teaching_aids/books_articles/probability_book /amsbook.mac.pdf					
2.	https://study.com/academy/topic/probability.html				
3.	https://onlinecourses.nptel.ac.in/noc18_ma07/preview				
4.	4. https://hbr.org/1964/07/decision-trees-for-decision-making				
References Books					
1.	Anderson, Sweeny, Williams, Camm and Cochran, Statistics for business and Economics, Cengage Learning, New Delhi, 13th Edition, 2017				
2.	Cooper, D.R., Schindler, P. And Business Research Methods, Tata- McGrew Hill,12th Edition, 2012.				
3.	Cooper, D.R., Schindler, P. and Sharma, J.K., Business Research Methods,11th Edition, Tata-McGraw Hill, 12 th Edition, 2018.				

4.	Johnson, R.A., and Wichern, D.W., Applied Multivariate Statistical Analysis, PHI Learning Pvt. Ltd., 6 th Edition, 2012.				
5.	Kumar, R., Research Methodology: A Step-by-Step guide for Beginners, Sage, South Asia, 4th Edition, 2014.				
6.	Srivastava, T.N. and Rego, S., Statistics for Manageme McGraw Hill, 3rd Edition, 2016.	ent, 2nd Edition, Tata			
	Methods of Evaluation				
	Continuous Internal Assessment Test				
Internal	Assignments	25 Marks			
Evaluation	Seminars	25 Marks			
	Attendance and Class Participation				
External Evaluation	ial End Semester Examination 75 Marks				
	Total	100 Marks			
	Methods of Assessment				
Recall (K1)	Simple definitions, MCQ, Recall steps, Concept definitions				
Understand/	MCQ, True/False, Short essays, Concept explanations, Short summary or				
Comprehend	overview				
(K2)					
Application (K3)	Suggest idea/concept with examples, Suggest formulae, Solve problems, Observe, Explain				
Analyze (K4)	Problem-solving questions, Finish a procedure in many steps, Differentiate between various ideas, Map knowledge				
Evaluate (K5)	e Longer essay/ Evaluation essay, Critique or justify with pros and cons				
Create (K6)Check knowledge in specific or offbeat situations, Discussion, Debating or Presentations					

PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8
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S-Strong M-Medium L-Low

BMA-CSA02

ALLIED MATHEMATICS –II

Credits: 5

Year: I/II, Sem:II/IV

LEARNING OUTCOMES:

• Students gain knowledge about basic concepts of Differential Equations, Laplace Transforms, Vector Analysis and Calculus.

UNIT I

Integral Calculus:Bernoullis formula – Reduction formulae- $\int_0^{\pi/2} \sin^n x \, dx$, $\int_0^{\pi/2} \cos^n x \, dx$, $\int_0^{\pi/2} \sin^n x \cos^n x \, dx$ (m,n being positive integers), Fourier series for functions in $(0,2\pi)$, $(-\pi,\pi)$.

Chapter 2: Section 2.7 & 2.9, Chapter 4: Section 4.1.

UNIT II

Differential Equations:

Ordinary Differential Equations: second order non-homogeneous differential equations with constant coefficients of the form ay" +by'+ cy = X where X is of the form $e^{\alpha x} \cos \beta x$ and $e^{\alpha x} \sin \beta x$ -Related problems only.

Partial Differential Equations: Formation, complete integrals and general integrals, four standard types and solving Lagrange's linear equation P p + Q q = R.

Chapter 5: Section 5.2.1, Chapter 6: Section 6.1 to 6.4

UNIT III

Laplace Transforms: Laplace transformations of standard functions and simple properties, inverse Laplace transforms, Application to solution of linear differential equations up to second order- simple problems.

Chapter 7: Section 7.1.1 to 7.1.4& 7.2 to 7.3

UNIT IV

Vector Differentiation: Introduction, Scalar point functions, Vector point functions, Wector differential operatorGradient, Divergence, Curl, Solenoidal, irrotational, identities.

Chapter 8, Section 8.1 to 8.4.4

UNIT V

Vector Integration:Line, surface and volume integrals, Gauss, Stoke's and Green's theorems (without proofs). Simple problems on these.

Chapter 8, Section 8.5 to 8.6.3.

Content and treatment as in

Allied Mathematics, Volume I and II, P. Duraipandian and S. Udayabaskaran, S. Chand Publications.

Reference:-

- 1. S. Narayanan and T.K. Manickavasagam Pillai Ancillary Mathematics, S. Viswanathan Printers, 1986, Chennai.
- 2. Allied Mathematics by Dr. A. Singaravelu, Meenakshi Agency.

e-Resources:

- 1. http://www.sosmath.com
- 2. http://www.analyzemath.com/Differential_Equations/applications.html

BST-CSA02

ALLIED STATISTICS-II

Year: I/II, Sem:II/IV

Credits: 5

Learning Outcomes: Upon finishing point of this course, students will be able to

- 1. understand the basic concept of Probability
- 2. identify the characteristics of different discrete and continuous distributions.
- 3. identify the type of statistical situation to which different distributions can be applied. comprehend the Sampling distributions.
- 4. to understand how to apply statistical tests to get information from data

Course Content:

UNIT- I: Basic concepts of Probability: Random Experiments, Sample space, Trial, Events, -Classical and empirical approach to probability and their limitations –Types of events: Exhaustive, mutually exclusive, equally likely and Independent events - Axiomatic approach to probability - Basic theorems on probability using axiomatic approach. Bayes Theorem (statement only)

UNIT- II: Discrete probability mass function, cumulative distribution function- Theory and problems based on it. Bernoulli distribution, Binomial Distribution and Poisson Distribution

UNIT- III: Continuous probability density function, cumulative distribution function -Theory and problems based on it. Normal Distribution and its properties, Standard Normal distribution, Problems based on it. Exponential Distribution

UNIT- IV: Estimating parameters of discrete and continuous distributions, Introduction of Sampling distributions- student's t and chi-square distributions, distribution of sample mean from normal distribution. Density function and Properties only.

UNIT- IV: Testing of Hypothesis, Single mean test and double means test based on normal distribution and students t-distribution. Proportion test, Chi-square test, ANOVA test.

Suggested Readings:

Books for Study:

- 1. Gupta, S. C and Kapoor, V. K (2002), *Fundamentals of Mathematical Statistics*, Sultan Chand and Sons, New Delhi.
- 2. Saxena H.C.: *Elementary Statistics*. S. Chand & Co., 2009.

UNIVERSITY OF MADRAS U.G. DEGREE COURSES SYLLABUS WITH EFFECT FROM 2020-2021 ANNEXURE

Course		NAME OF THE	INST.		MARKS			
Content	COURSE CODE	COURSE	Hr/ Week	CREDIT	CIA	EXT	TOTAL	
		BST-CSA01	3	2	40	60	100	
PART III	(Practicals)	&BST-CSA02						

(BST-CSA01 &BST-CSA02)

ALLIED STATISTICS -I & II – (PRACTICALS) (At the end of even Semester - Any 23 Excercises)

Credits: 4 (2+2)

MEASURES OF CENTRAL TENDENCY

- 1. Mean, median and mode-raw data
- 2. Mean, median and mode-discrete data
- 3. Mean, median and mode-continuous data

MEASURES OF DISPERSION

- 4. Range, quartile deviation, mean deviation and standard deviation-raw data
- 5. Range, quartile deviation, mean deviation and standard deviation-discrete data
- 6. Range, quartile deviation, mean deviation and standard deviation-continuous data
- 7. Coefficient of Variation
- 8. Karl Pearson Coefficient of Correlation
- 9. Spearman's Rank Correlation (when Ranks are given
- 10. Spearman's Rank Correlation(When Ranks are not given)
- 11. Spearman's Rank Correlation (When Ranks are not given repeated ranks)

- 12. Association of Attributes- Chi square independence of attributes
- 13. Fitting of Binomial, Poisson, Normal distribution
- 14. LARGE SAMPLE TEST (Test for Specified Mean, Test for equality of two means, Test for specified proportion, Test for equality of two proportions)
- 15. SMALL SAMPLE TEST(t test for test of significance of single mean,t test for test of significance of difference of two means)
- 16. Chi square test(Chi square test for independence of attributes, Chi square test for specified population variance)
- 17. ANOVA(One way classification, Two way classification)

GRAPHICAL EXERCISES:

- 18. Simple bar diagram.
- 19. Multiple bar diagram.
- 20. Sub divided bar diagram.
- 21. Percentage bar diagram.
- 22. Pie diagram.
- 23. Ogive curve
- 24. Lorentz curve.

NOTE: Use of non programmable scientific calculators are allowed

UNIVERSITY OF MADRAS B.Com. (GENERAL) DEGREE COURSE SYLLABUS WITH EFFECT FROM 2020-2021

BGE-CSA4A

ALLIED-IV(A): ELEMENTS OF OPERATIONS RESEARCH

Common to BCom(A&F), BCom(MM), BCom(CA) & BCom(ISM)

Inst.Hrs: 6 Credits: 5 YEAR: II SEMESTER: IV

OBJECTIVES

- To Facilitate this Understanding of the Concept of Operations Research
- To Help the Students to Understand the Various Techniques of Solving Problems

OUT COME:

• Understanding of the Concept of Operations Research and to Help the Students to Understand the Various Techniques of Solving Problems

UNIT I : Introduction

Operations Research- Meaning-Definition - Origin and History- Characteristic Features – Need-Scope – Steps- Techniques- Application- Limitations

UNIT II : Linear Programming Problem Lpp

Meaning- Requirements- Assumptions- Applications- Formulating Lpp –Advantages-Limitations Formulating LP Model (Simple Problems Only)

UNIT III: Methods Of Lpp

Obtaining Optimal Solution for Linear Programming Problem (LPP)-Graphical Method -Problems --Simplex Method for Type of LPP and for Slack Variable Case -Maximization Function -Minimization Function (Simple Problem Only)

UNIT IV : Transportation Problems

Meaning –(Initial Basic Feasible Solution)Assumptions -Degenerate Solution -North -West Corner Method- Least Cost Method -Vogels Approximation Method -Assignment Problems-Features -Transportation Problem Vs Assignment Problem -Hungarian Method (Simple Problems Only)

UNIT V: Game Theory

Meaning- Types of Games- Basic Assumptions- Finding Value of Game for Pure Strategy -Mixed Strategy -Indeterminate Matrix and Average Method -Graphical Method -Pure Strategy- Saddle Point Payoff Matrix Value of Game (Simple Problems Only)

Recommended Texts

- 1. M.Sreenivasa Reddy Operations Research CENGAGE, New Delhi
- 2. S.Gurusamy–Elements of Operations Research–Vijay Nicole Imprints private Limited, Chennai

UNIVERSITY OF MADRAS B.Com. (GENERAL) DEGREE COURSE SYLLABUS WITH EFFECT FROM 2020-2021

SUGGESTED READINGS

- 1. Agarwal NP and Sonia Agarwal, Operations Research and Quantitative Techniques, RBS A Publishers, New Delhi ,2009
- 2. Anand Sharma, Operations Research, Himalayan Publishing House, 2014, Mumbai
- 3. Gupta Pk And Gupta SP Quantitative Techniques and Operations Research, Sultan Chand and Sons, 2014, New Delhi
- 4. Kapoor V.K, Operations Research Techniques For Management, Sultan Chand And Sons, 2012 New Delhi
- 5. Kanti Swarup, P.K. Gupta Man Mohan , operation research, Jain book agency, 2014, New Delhi
- 6. Sarangi, SK Applied operations research and Quantitative methods, Himalayan publishing house 2014, Mumbai.

E- SOURCES:

http://www.learnaboutor.co.uk/ http://www.theorsociety.com/ www.orcompleate.com/ http://www.orsi.in/

UNIVERSITY OF MADRAS B.B.A. DEGREE COURSE IN BUSINESS ADMINISTRATION SYLLABUS WITH EFFECT FROM 2020-2021

BBA-DSA04

ALLIED-IV: OPERATIONS RESEARCH

CREDITS:5

IV SEM/II YEAR

Learning Objectives :

- 1. To familiarise about operations research and its significance in business
- 2. To know and use the various decision-making tools used in business.

UNIT – I

Introduction to OR – Meaning and scope – Characteristics – models in OR.LPP- Formulation graphical method – Simplex method- Big M Method application in Business – merits and Demerits.

UNIT – II

Transportation model – basic feasible solution – formulation, solving a TP. Assignment models – formulation – solution.

UNIT – III

Network analysis – work break down analysis – construction – numbering of event. Time Calculation – critical path, slack, float – application.

$\mathbf{UNIT} - \mathbf{IV}$

Queuing models- elements of queuing system – characteristics of queuing model.

UNIT – V

Decision theory – statement of Baye's theorem application. Probability – decision trees. Game theory meaning and characteristics – saddle point – Dominance property.

RECOMMENDED TEXTS / REFERANCE BOOKS

- 1. P.R. Vittal&V.Malini, Operative Research Margham Publications Chennai 17.
- 2. P.K.Gupta& Man mohan, Problems in Operations Research Sultan Chand & sons NewDelhi
- 3. V.K.Kapoor, Introduction to operational Research Sultan chand& sons New Delhi
- 4. Hamdy A Taha, Operation Research An Introduction prentice Hall of India- NewDelhi

Quantitative Techniques for Business Decisions SEMESTER II – CORE PAPER-6

COURSE CODE:Com204 L:P:T:S EXAM HOURS: 3 CREDITS: 4 CIA MARKS: 25 ESE MARKS: 75

COURSE OBJECTIVES:

To provide knowledge in quantitative methods and applications and to offer expertise in quantitative analysis

COURSE OUTCOMES:

At the end of the course the students will be able to

CO1	Illustrate quantitative methods and statistical tools for business problems. (U)
CO2	Explain the application of statistics in business Decision making. (U)
CO3	Choose appropriate Statistical methods for data analysis. (P)
CO4	Analyse the data using Descriptive and Inferential statistics. (P)
CO5	Interpret the statistical results to make meaningful decisions. (U)

MAPPING OF COURSE OUTCOMES TO PROGRAM OUTCOMES

	PSO 1	PSO2	PSO3
CO1	3	-	-
CO2	2	3	-
CO3	2	3	-
CO4	2	3	-
CO5	2	3	-

3- Strong Correlation 2- Medium Correlation 1- Low Correlation

Unit	Contents of Module	Hrs	CO
1	Theory of probability -probability rules -Baye's theorem -Probability	15	1
	distribution -Binomial, Poisson and Normal. Statistical decision theory -		
	Decision environment -decision making under certainty and uncertainty		
	and risk conditions -EMV, EOL and marginal analysis -value of perfect		
	information - decision tree analysis		
2	Sampling-Meaning of random sample -sampling methods -sampling error	15	2
	and standard error relationship between sample size and standard error		
	Sampling distribution -characteristics- central limit theorem -estimating		
	population parameters - point and interval estimates -estimating		
	proportion, percentage and mean of population from large sample and		
	small sample		
3	Testing hypothesis -testing of proportions and means -large samples -	15	3
	small samples -one tailed and two tailed tests -testing differences between		
	mean and proportions -errors in hypothesis testing -chi square distribution		
	-characteristics -applications -test of independence and tests of goodness		
	of fit - inferences -F distribution- testing of population variance- analysis		
	of variance -one way and two way - using SPSS		
4	Correlation and regression -Simple, partial and multiple correlation -	15	4
	simple, partial and multiple regressions -estimation using regression line -		
	standard error of estimate -testing significance of correlation and		
	regression coefficients -interpreting correlation -explained variation and		
	-factor, cluster and discriminant analysis		
5	Linear programming graphic and simplex models -maximization and	15	5
	minimization - transportation –Assignment		č
5	-factor, cluster and discriminant analysis Linear programming graphic and simplex models -maximization and minimization - transportation –Assignment	15	

Note: The proportion between theory and problems shall 20:80

QUESTION PAPER PATTERN:

PART A - 10 OUT OF 12	= 10 X 1 = 10 marks
PART B - 5 OUT OF 7	= 5 X 5 = 25 marks
PART C - 4 OUT OF 6	= 4 X 10 = 40 marks

RECOMMENDED TEXT BOOKS:

1 Richard I. Levin and David S Rubin, Statistics for Management, 7th Ed. Pearson Education New Delhi

2 Gupta, Statistical Methods, Sultan Chand

3 Johnson, Applied Multivariate Statistical Analysis, 5th Ed, Pearson Education

WEB REFERENCES:

http://fe.ugm.ac.id/iup/material/syllabi_quantitative.pdf www.aiu.edu http://www.duxbury.com/sme6/index.html