

CIRCULAR :-

A reference is invited to the Ordinance, Regulations and syllabi relating to the Post - Graduate - Diploma course in Applied Statistics with Software vide this office Circular No. UG/ 363 of 2005 dated 5th September, 2005 and the Head, University Department of Statistics, the Principals of the affiliated Colleges in Arts, Science and Commerce and the Professor-cum-Director, Institute of Distance Education are hereby informed that the recommendation made by the Board of Studies in Statistics at its meeting held on 12th March, 2008 has been accepted by the Academic Council at its meeting held on 15th April, 2008 vide item No. 4.14 and that, in accordance therewith, the Post-Graduate Diploma in Applied Statistics with Software is revised as per Appendix and that the same has been brought into force with effect from the academic year 2008 - 2009.

MUMBAI-400 032

14th July, 2008PRIN.K.VENKATARAMANI
REGISTRAR

To.

The Head, University Department of Statistics, the Principals of the affiliated Colleges in Arts, Science and Commerce and the Professor-cum-Director, Institute of Distance Education.

AC/4.14/15/04/2008No.UG/306-A of 2008, MUMBAI-400 03 dated 5th Sept 14th July, 2008

Copy forwarded with compliments for information to :-

- 1) The Deans of the Faculties of Arts, Science and Commerce.
- 2) The Chairman, Board of Studies in Statistics.
- 3) The Controller of Examinations.
- 4) The Co-Ordinator, University Computerization Center.

(D.H.KATE)
DEPUTY REGISTRAR

U.G./P.G.Section.

MUMBAI-400 032

14th July, 2008PRIN.K.VENKATARAMANI
REGISTRAR

Copy to :-

The Director, Board of College and University Development, the Deputy Registrar (Eligibility and Migration Section), the Director of Students Welfare, the Executive Secretary to the to the Vice-Chancellor, the Pro- Vice-Chancellor, the Registrar and the Assistant Registrar, Administrative sub-center, Ratnagiri for information.

The Controller of Examinations (10 copies), the Finance and Accounts Officer (2 copies), Record Section (5 copies), Publications Section (5 copies), the Deputy Registrar, Statistical Unit (2 copies), the Deputy Registrar Migration Section (3 copies), the Deputy Registrar, Affiliation Section (2 copies), the (Accounts Section), Vidyavanagari (2 copies), the Deputy Registrar, University Computer Professor-cum- Director, Institute of Distance Education, (10 copies) the Director University Computer Center (10 copies), Vidyavanagari, (2 copies) the Deputy Registrar (Special Cell), the Deputy Registrar, Academic Authorities Unit (2 copies) and the Assistant Registrar, Executive

UNIVERSITY OF MUMBAI



Revised Syllabus For Post-Graduate Diploma in Applied Statistics with Software

(With effect from the academic year 2008-2009)

POST-GRADUATE DIPLOMA IN APPLIED STATISTICS WITH SOFTWARE

The following will be the scheme of PGDASS examination for the branch of Statistics with effect from 2008-2009 :

Scheme of Examination:

The evaluation of the performance of a student in each paper shall be based upon both internal and external examination. The external examination will be held only once at the conclusion of an academic term. The external examination will consist of SEVEN papers and each of THREE hours.

Subject	Title	Internal	External	Total
Paper I	Basic Statistics			
Paper II	Marketing Research	40	60	100
Paper III	Regression and Linear Model	40	60	100
Paper IV	Decision Making and Forecasting	40	60	100
Paper V	Statistical Process Control	40	60	100
Paper VI	Medical Statistics	40	60	100
Paper VII	Multivariate Techniques	40	60	100
Paper VIII	Communication Skills and Project	100	---	100

First term will consist of first four papers & Second term will consist of next four papers.

PAPER I: BASIC STATISTICS

	Topics
Sr. No.	Exploratory Data Analysis
1.	Concepts of Probability
2.	Concepts of Random Variable, Probability distribution,
3.	Distribution Function, Expected Value, Variance and Higher Moments.
4.	Probability generating function, moment generating function, cumulate generating function and cumulant.
5.	Basic discrete and continuous distributions
6.	Concepts of independence, jointly distributed random variables and conditional distributions, use of generating functions.
7.	Central limit theorem and its application
8.	Concepts of random sampling, statistical inference and sampling distribution.
9.	Methods of estimation and properties of estimators.
10.	Confidence intervals for unknown parameters.
11.	Testing of hypothesis
12.	Correlation and regression analysis
13.	Concepts of analysis of variance
14.	Concepts of conditional expectation and compound distribution.

Reference Books:

1. Rohatgi V. K. & A. K. MD. Ehsanes Saleh (2001): An Introduction to probability theory and Mathematical Statistics Second Edition.
2. Wackesly D.D, Mondonhall III, William and Scheffer R. L.(2002): Mathematical Statistics with application.
3. Anderson David R, Sweeny Dewis J and Williams Thomas A (2004) Statistics for business and economics
4. Levin Richard I and Rubin David S (1994) Statistics for management.

PAPER II: MARKETING RESEARCH

Sr. No.	Topics
1.	Definition of marketing research and market research, need for marketing research, requirement of good marketing research, manager researcher relationship, competitive and complex nature of Indian markets, role of research in new product development, packaging, branding, positioning, distribution and pricing, ethics in Business Research.
2.	Steps in marketing Research.
3.	Techniques for identifying management problem and research problem.
4.	Meaning & types of research designs-exploratory, descriptive and causal.
5.	Exploratory research designs, Sampling & data collection methods.
6.	Causal research designs: Data collection methods
7.	Descriptive research design :Sampling methods, Types of scales , questionnaire design
8.	Preparations research proposal
9.	Objectives and data needs for consumer research.
10.	Objectives and data needs for product research.
11.	Objectives and data needs for pricing research
12.	Objectives and data needs for advertising research.
13.	Consumer segmentation techniques: Chi-square test of independence , Cluster analysis
14.	Customer discriminating technique :Discriminant analysis.
15.	Product positioning techniques :Snake chart,Benefit structure analysis, Multi-dimensional scaling technique Factor analysis
16.	New product development technique :Conjoint analysis
17.	Report writing

Reference Books:

1. Kinnear Thomas C and Taylor James R (1995)
Marketing Research: An applied Approach
2. Green Paul E , Tull Donalds, Albaum Gerald (1988)
Research for Marketing Decision
3. Nargundkar Rajendra (2003), Marketing Research Text & Cases
4. David A. Aaker (2004) Marketing Research
5. Malhotra Naresh (2006) Marketing Research
An applied Orientation and SPSS 14.0 student CD
6. Burns C. Alvin & Bush Ronald (2006) : Marketing Research with SPSS 13.0
7. Boyd Harper W.Jr. Westfall Ralph, Stasch Stanley F. (1977)
Marketing Research: Text & Cases
8. Harvard Business Review: Select Articles on Marketing Research.

PAPER III: REGRESSION AND LINEAR MODEL

No.	Topics
	Simple linear regression
	Multiple linear regression
	Regression diagnostics
	Transformation of variable
	Analysis of collinear data
	Logistic regression
	Stepwise regression
	ONE WAY ANOVA
	TWO WAY ANOVA
	Multiway ANOVA and Nested Analysis
	Comparison of individual means
	Analysis of covariance
	One Way Random effect model
	Two way Mixed Model

Reference Books:

1. Chatterjee Samprit, Hadi Ali S., Price Betram (2000): Regression Analysis by Example Third Edition
2. Draper Norman R., Smith Harry (2003): Applied Regression Analysis Third Edition
3. Kshirsagar Anant M. (1983): A course in Linear Models
4. Seber George A.F.(2003) Linear regression analysis
5. Dielman Terry E : (2004) Applied regression analysis :A second course in Business and Economic Statistics
6. Chatterjee Samprit, Handcock Marks, Simonoff Jeffrey (1994) (1994) A Caselook for a list course in Statistics and data analysis

PAPER IV: DECISION MAKING AND FORECASTING

Sl. No.	Topic
1	Basic Concepts of Forecasting and Decision Making. Qualitative Methods of Forecasting (Delphi, Subjective Probabilities, Market Research)
2	Quantitative Techniques of Forecasting and Regression Model.
3	Quantitative Techniques of Forecasting and other Casual Models. (Econometric, Input-Output, Leading Indicator)
4	Quantitative Techniques of Forecasting Time Series Model. (Trend Projection)
5	Quantitative Techniques of Forecasting Time Series Model. (Smoothing and Decomposition)
6	Quantitative Techniques of Forecasting and Box Jenkins Model.
7	Selection of Right Forecasting Methods.
8	Decision Making and Quantitative Tools
9	Decision Making and Qualitative Tools
10	Steps in Decision Making
11	Inventory management and introduction, inventory control, costs in inventory problems, Techniques of Inv. Control and with selective control (ABC analysis, Usage rate and criticality)
12	Techniques of inv. Control and with known demand and E.O.Q with uniform demand, prod. Runs of unequal length, with finite rate of replenishment, Problem of E.O.Q with shortage
13	Techniques inv. Control and with uncertain demand and buffer stock computation, stochastic problems and uniform demand.
14	Techniques inv. Control and with price discounts
15	Financial Applications and Computation of net present value, future value and internal rate of return, converting effective interest rate to nominal rate, computing compound interest, accumulated value, discount, annuities etc.
16	Break even analysis, Standard / Marginal Costing

Reference Books:

1. Mayes Timothy R., and Shack Todd. M(2006): Financial Analysis with Microsoft Excel.
2. Martin Mindy C., Hansen Steven M., Klingher Beth,(1996): Mastering Excel 2000 Premium Edition.
3. Spyros G Makrindakis Stevan C. Wheelwright Rob J. Hyndman: Forecasting: Methods & Applications
4. Hanke John E. , Reitsch Arthur G., Wichern Dean W. : Business Forecasting 7th Edition

PAPER V: STATISTICAL PROCESS CONTROL.

No.	Topics
7	QC tools, 7 New QC tools
	Control Charts for variables
	Control charts for
	Process and measurement system capability analysis
	Factorial and Fractional factorial experiments for process
	design and improvement
	Response surface methods and designs
	Taguchi techniques
	Six sigma
	Japanese System
	ISO 9000

Reference Books:

1. Montgomery Douglas C. (2004): Introduction to statistical quality control Fourth Edition.
2. Phadke Madhav S. (1989): Quality Engineering Using Robust Design
3. Kaoru Ishikawa(1986): Guide To Quality Control Second Edition.
4. Genichi Taguchi (1991): Introduction to Quality Engineering: Designing Quality into Products and Processes Second Edition.
5. Brassard Michael & Diane Riffer (1994): The Memory Jogger II
6. Harry Mikel & Schroeder Richard (1999): Six Sigma The Breakthrough Management.
7. Pande Peter S., Neuman Robert P. & Cavanagh Rolana R.(2002): (Six Sigma Way Team) An Implementation Guide for Process Improvement.

PAPER VI: MEDICAL STATISTICS

Sr. No.	Topic
1	Phase I, II and III Clinical Trials
2	Randomization
3	Blinding and Placebos
4	Sample size calculation
5	Comparing more than two treatments.
6	Causality, Non-compliance and Intent-to-treat
7	Survival analysis in Phase III clinical trials
8	Early stopping of clinical trials
9	Multiplicity and interim analysis
10	Parallel and Crossover designs
11	Binary Response data, Categorical Data Analysis
12	Comparing Methods of measurements.
13	Meta analysis
14	Repeated measures analysis

Reference Books:

1. Shoukri M. M., Paise C. A. (1999): Statistical Methods for Health Sciences Second Edition.
2. Davis Charles S. (2002): Statistical Methods for the Analysis of Repeated Measurements.
3. Finney D.J. (1964) : Statistical Method in Biological Assays.
4. Fleiss Joseph L., Levin Bruce & Paik Myunghee Cho (2003): Statistical Methods for Rates and Proportions
5. Dr. Fieller Nick (2007): Medical Statistics: Clinical Trials
6. Zhang Daowen (2007): Statistical Principles of Clinical Trials (Lecture Notes)

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PAPER VII: MULTIVARIATE TECHNIQUES

No.	Topic
1	The organization of Data
2	Applications of Multivariate Techniques.
3	Data Display and Pictorial Representation.
4	Assessing the Assumption on Normality
5	Detecting Outliers and Data Cleaning
6	Transformations to Near Normality
7	Hotelling's T^2 and Likelihood Ratio Tests
8	Confidence Regions and simultaneous Comparisons of
9	Component Means.
10	Large Sample Inferences about a Population Mean Vector
11	The Classical Linear Regression Model.
12	Graphing the Principal Components
13	Large Sample Inferences
14	The Orthogonal Factor Model
15	Methods of Estimation
16	Factor Scores
17	Factor Rotation
18	Perspectives and a Strategy for Factor Analysis
19	Canonical Variates and Canonical Correlations
20	Discrimination and Classification
	Multi Dimensional Scaling

Reference Books:

1. Johnson, Richard A. and Wichern, Dean W.(2007): Applied Multivariate Statistical Analysis.
2. Seber, G.A.F. (1984): Multivariate observations
3. Bishop Yuonne M.M., Fienbeng S. E., Holland P. W.(1975): Discrete Multivariate Analysis Theory and Practice.

PAPER VIII

Module I : COMMUNICATION SKILLS

Sr. No.	Topic
1	Spoken & Written communication
2	Preparing and organizing a public speech: Topic selection, Research Methods, Overcoming anxiety, arranging main points, Constructing introductory and concluding remark; Development and delivering informative-style and persuasive-style, speeches; Debating: Fundamentals of debating, Premises and process of debate, Basic rules & language, Building & processing cases, Rebuttal arguments, Timing, Roles of the speakers, Judges & moderator; Debating style: Parliamentary, Academic, Cross- examination informal and impromptu speaking exercises.
3	Politics & governance, Business, Social, Morals & ethics, Culture & education, Law & order, Science & technology, Handling questions.
4	Personal communication, Business communication, Report Writing.
5	Fundamentals of Presentations: Effective presentation- understanding effective presentation, understanding different types of presentation; Planning presentations: Establishing objectives, Determining objectives, Making realistic objectives;
6	Analysing audience, Selecting supporting material, Understanding the types of supporting materials, Exploring retention & visual aids; Building presentation: Developing introduction, Capturing attention of audience, Organizing body of presentation, Creating conclusions, Closing presentation; Presentation mechanism: Power point, Visual aids, Speaker notes & footnotes, Reviewing presentations.

References:

1. Bahl Sushil (1996): Business Communication Today
2. C. S. Rayadu: Media & Communication Management.
3. Thrill V. John, Bovee Courtland (2004): Excellence in Business Communication.
4. Nichols Ralph G., Leonard A. Stevens, Bartolome Fernando ,Argyris Chris (1999) : Harvard Business Review on Effective Communication

Module II : PROJECT

Students should carry out the project on Statistical Application based on data

Note: All the course will be taught using Statistic Software such as
SAS/SPSS/MINITAB