M.Sc Computer Science & Statistics from the admitted batch of 2015-16

Semester	Paper	Marks	Credits
I	1.1 Probability & Distribution	80+20	4
	1.2 Estimation Theory	80+20	4
	1.3 Sampling	80+20	4
	1.4 C Programming	80+20	4
	1.5 Practical Examination (Pract.150+Rec.50)	200	8
	1.6 Viva-Voce	25	1
	Total	**625**	**25**
II	2.1 Multivariate Analysis	80+20	4
	2.2 Testing of Hypothesis	80+20	4
	2.3 Stochastic Processes	80+20	4
	2.4 Designs of Experiments	80+20	4
	2.5 Non-Core (To be selected from the List)	80+20	4
	2.6 Practical Examinations (Prac.150+Rec.50)	200	8
	2.7 Viva-Voce	25	1
	Total	**725**	**27**
III	3.1 Computer Organization & Architecture	80+20	4
	3.2 Data Structures Using C	80+20	4
	3.3 Client Server Technology	80+20	4
	3.4 OOPs in C++ and Unified Modelling Language	80+20	4
	3.5 Non-Core (To be selected from the List)	80+20	4
	3.6 Practical Examinations (Prac.100+Rec.50)	150	6
	3.7 Viva-Voce	25	1
	Total	**675**	**27**
IV	4.1 Forecasting Methods	80+20	4
	4.2 Visual Application Development	80+20	4
	4.3 Distributed JAVA Objects	80+20	4
	4.4 VB.NET	80+20	4
	4.5 Project Work	100	4
	4.6 Practical Examination (Prac.100+Rec.50)	150	6
	4.7 Viva-Voce	25	1
	Total	**675**	**27**

The detailed syllabus is enclosed herewith in Appendix-I.

K.Srinivasa Rao
(Chairman, P.G. B.O.S)

APPENDIX - I

SYLLABUS
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M.SC. COMPUTER SCIENCE & STATISTICS
SEMESTER – I

Paper – 1.1: PROBABILITY AND DISTRIBUTIONS

UNIT-I: Classes of sets, field, Sigma-field, minimal sigma-field, Borel field. Limit of a sequence of sets. Measure on field, extension of measure to sigma field, Lebesgue measure, Lebesgue- Stieltjes measures. Measurable functions, Borel function, induced sigma field.

UNIT-II: Random variable, convergence of sequence of random variables-convergence in probability, almost surely, in the rth mean and in distribution, and their relationships. Characteristic function, properties, inversion theorem, continuity theorem, Central limit theorem, Lindberg-Levy, Liapunoff forms.

UNIT-III: Mathematical Expectation, Moments of random variable, conditional expectation, problem of moments. Basic Markov's, Chebycheff's, Holder's, Minkowski's and Jensen's inequalities. Law of large numbers: Chebyshev's and Khinchin's forms of WLLN. Kolmogorov's SLLN. Convergence theorems relating to X_n+Y_n, X_nY_n and X_n/Y_n where $X_n \to X$ and $Y_n \to C$.

UNIT-IV: Weibull and Laplace distributions-their m.g.f and c.f and other properties. Compound distributions-Poisson-Binomial. Sampling distributions: Non-Central chisquare, non central-t and non central F distributions and their properties. Distribution of quadratic forms under normality and related distribution theory.

UNIT-V: Multivariate normal, Bivariate normal as a particular case, moments, characteristic function, conditional and marginal distributions. Distributions of Order Statistics from rectangular, exponential and Normal distributions. Empirical distribution function, distribution of correlation coefficient.

Text Books:
Bhat, B.R.: Modern Probability Theory.,Wiley Eastern Ltd.
Rohatgi, V.K.: An Introduction to Probability Theory and Mathematical Statistics, John Wiley.
Goon, A.M., Gupta, M.K., Das Gupta, B.: An Outline of Statistical Theory Volume-I, The World Press Pvt. Ltd., Calcutta.

Reference Books:
Billingsley, P. (1986): Probability and Measure. Wiley.
Kingman, J F C and Taylor, S. J. (1966): Introduction to Measure and Probability. Cambridge University Press.

David,H.A (1981) : Order Statistics, 2nd Ed, John Wiley.
Feller, W (1966) : Introduction to probability theory and its applications, Vol.II, Wiley
Cramer H (1946) : Mathematical Methods of Statistics, Princeton University Press
Morrison, D.F (1976) : Multivariate Statistical Methods, 2nd Ed, McGraw Hill
Mardia, K.V.,Kent J.T and Bibby J.M.(1979) : Multivariate Analysis, Academic Press.
Anderson, T.W(2003) : An introduction to Multivariate Statistical Analysis, 3rd Ed ,John Wiley
R.A.Johnson and D.W.Wichern (2007) : Applied Multivariate Statistical Analysis, 6th Ed Prentice Hall India

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SEMESTER – I

Paper – 1.2: ESTIMATION THEORY

UNIT-I: Point Estimation: Concepts of Unbiasedness, Consistency, minimum variance unbiased estimation, Information in a sample, Cramer-Rao inequality, efficiency of an estimator, Chapman-Robin's inequality and Bhattacharya bounds, definition of CAN estimator.

UNIT-II: Concept of sufficiency – single parameter and several parameter cases. Fisher-Neyman Factorization theorem, Minimal sufficient statistic, exponential families and Pitman families. Invariance property of sufficiency under 1 – 1 transformation of sample space and parameter space.

UNIT-III: Distributions admitting sufficient Statistics, Rao-Blackwell Theorem, Completeness, Lehman-Scheffe Theorem, joint sufficiency (regular case).

UNIT-IV: Method of maximum likelihood, CAN estimators for one-parameter Cramer family. Cramer-Huzurbazar theorem, solution of likelihood equations, Method of scoring. Connection between MLE's and efficient estimators, MLE's and sufficient estimators.

UNIT-V: Censored and truncated distributions: Type 1 and Type 2 Censoring for normal and exponential distributions and their MLE's. Interval estimation: Confidence Intervals, using pivots; shortest expected length confidence intervals.

Text Books:
Goon, A.M., Gupta, M.K., Das Gupta, B.: An Outline of Statistical Theory Volume -II, The World Press Pvt. Ltd., Calcutta.
Rohatgi, V.(1998): An Introduction to Probability and Mathematical Statistics, Wiley Eastern Ltd., New Delhi.
Kale, B.K.(1999) : A First Course on Parametric Inference, Narosa Publishing house.

Reference Books:
Lehmann, E.L. (1986) : Theory of Point Estimation. John Wiley
Rao, C.R. (1973) : Linear Statistical Inference and its applications. John Wiley
Dudewicz, E.J. and Mishra, S.N.(1988): Modern Mathematical Statistics. Wiley, Int.Student edition.
Lawless J.F (2003) : Statistical Models and Methods for Lifetime Data,2nd Ed, John Wiley & Sons

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SEMESTER – I

Paper – 1.3: SAMPLING

UNIT-I: Selection with varying probabilities, PPS sampling, Horvitz and Thompson estimator, Yates and Grundy's estimator, Midzuno -Sen Sampling Scheme.

UNIT-II: Systematic Sampling: Estimation of population mean and its variance, Methods for populations with linear trend: Yates end correction, Modified systematic sampling, balanced systematic sampling, centrally located sampling. Circular systematic sampling.

UNIT-III: Cluster sampling: Estimation of population mean and its variance, efficiency of cluster sampling. Determination of optimal cluster size. Estimation of proportion. Cluster sampling with varying sizes.

Two-stage sampling: Two-stage sampling with equal first stage units. Estimation of mean and its variance. Optimum allocation. Three stage sampling with equal probabilities. Two-stage-pps sampling.

UNIT-IV: Ratio estimator: Introduction, Bias and Mean square error, Estimation of variance, confidence interval, comparisons with mean per unit estimator, Ratio estimator in stratified random sampling.

Difference estimator and Regression estimator: Introduction, Difference estimator, Difference estimator in stratified sampling. Regression estimator, Comparison of regression estimator with mean per unit estimator and ratio estimator. Regression estimator in stratified sampling.

UNIT-V: Multiphase Sampling: Introduction, Double sampling for Difference estimation Double sampling for ratio estimation. Double sampling for regression estimator, Optimum allocation varying probability sampling. Non sampling errors: Sources and types of non Sampling errors, Non response errors, techniques for adjustment of non response, Hansen and Hurwitz Technique, Deming's Model.

Text Books:
F.S. Chaudhary: Theory and Analysis of Sample Survey Designs, New Age International Publishers, Delhi.
Des Raj, Pramod Chandak (1998) : Sample survey Theory, Narosa Publishing House, Delhi
Cochran, W.G.: Sampling Techniques.
Murthy, M.N.: Sampling Theory and Methods
Primal Mukhopadhyay : Theory and Methods of Survey Sampling. Prentice-Hall of India Private limited – New Delhi.
Sukhatme, P.V. and Sukhatme, B.V.: Sampling Theory of Surveys with Applications.

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SEMESTER – I

Paper – 1.4: C - PROGRAMMING

UNIT-I: Identifiers and Keywords, Data types, constants, variables and arrays, Declarations, expressions, statements, symbolic constants.

Operations and expressions: Arithmetic operators, Unary operators, relational and logical operators, Assignment operators, conditional operator, and library functions.

UNIT-II: Data Input and Output: getchar, putchar functions, scanf, printf, gets puts functions. Control statements: While, do-while, for, nested loops, if-else, switch, break, continue exit operator, goto statement. Functions: Definition, accessing a function, passing arguments to a function, specifying argument types, function prototypes, and recursion.

UNIT-III: Program Structure: Storage classes, automatic, external and static variables. Arrays: Definition, processing an array, passing arrays to a function. Multi dimensional arrays, Arrays and strings.

UNIT-IV: Pointers: Fundamentals, pointer declarations, passing pointers to a function, pointers and multi-dimensional arrays, operations on pointers, arrays of pointers, passing functions to other functions.
UNIT-V: Structures and Unions: Definition, processing, structures and pointers, passing structures to a function. Data Files: Opening and closing a data file, creating, processing a data file, unformatted data files.

Text Books::
Programming in ANSI C (2002) : Balaguruswamy, E, Tata McGraw Hill,6th Edition.
Problem solving with C: M.T.Somasekhara, Prentice Hall India.

The C-Programming Language: Brain, W.Karnighan & Dennis, M.Reitech, Prentice Hall India Ltd.
Programming with C: Byrun, S.Gotterfield, Schism's Outline Series, Tata McGraw Hill Edition.
Programming in C S.G. Kochan (2014) :,4th Ed, Pearson Education

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SEMESTER – II

Paper – 2.1: MULTIVARIATE ANALYSIS

UNIT-I: Definition of Wishart matrix and its properties, Mahalanobis Distance, Null distribution of Hotelling's T^2 statistic. Application in tests on mean vector for one and more multivariate normal populations and also on equality of the components of a mean vector in a multivariate normal population.

UNIT-II: Classification and discrimination procedures for discrimination between two multivariate normal populations, sample discriminant function, tests associated with discriminant functions, probabilities of misclassification and their estimation, classification into more than two multivariate normal populations. K-nearest neighbor classification.

UNIT-III: Principal components, Dimension reduction, Canonical variables and canonical correlation -definition, use, estimation and computation.

UNIT-IV: Factor Analysis: The orthogonal factor model, Methods of estimating factor loadings - the principal component method, principal factor method, iterated principal factor method, maximum likelihood estimation. Factor rotation: orthogonal factor rotation, varimax rotation , quartimax rotation, oblique rotation, criteria for determining number of common factors. Factor scores.
UNIT-V: Cluster Analysis: Hierarchical Clustering, methods single, complete and average linkage methods, Centroied method and Ward's method. Non-Hierarchical Methods- K-means algorithm. Multidimensional scaling.

Note: Practical exercises must be based on statistical package only.
Text Books:
Anderson, T. W. (1983): An Introduction to Multivariate Statistical Analysis. 3rd Ed. Wiley.
Seber, G. A. F. (1984): Multivariate observations. Wiley.
Johnson, R and Wichern(1992): Applied Multivariate Statistical Analysis, Prentice Hall, India, 6th edition.

References Books:
Gin. N. C. (1977) : Multivariate Statistical Inference. Academic Press

Kshirsagar, A. M. (1972) : Multivariate Analysis. Marcel Dekker.
Morrison. D. F. (1976): Multivariate Statistical Methods. 2nd Ed. McGraw Hill
Muirhead, R. J. (1982): Aspects of Multivariate Statistical Theory, J. Wiley.
Rao, C. R. (1973): Linear Statistical Inference and its Applications. 2nd ed. Wiley.
Sharma. S. (1996): Applied Multivariate Techniques. Wiley.
Srivastava, M. S. and K.Chatri, C. G. (1979): An Introduction to Multivariate Statistics. North Holland

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SEMESTER – II

Paper – 2.2: TESTING OF HYPOTHESIS

UNIT-I: Neyman – Pearson theory: Lemma using critical functions. Uniformly most powerful tests, their relation with sufficient statistics.

UNIT-II: Monotone Likelihood ratio and UMP tests for one-sided hypothesis, Composite hypothesis. Unbiased tests, uniformly most powerful unbiased tests. Type A and Type A$_1$ regions.

UNIT-III: Likelihood ratio criterion, its asymptotic distribution, one sample, two samples and K – sample problems. Linear hypothesis. Walds's SPRT: Proof that it terminates in a finite number of steps with probability 1. O.C. and A.S.N. functions. Examples of (i) Binomial (ii) Normal cases for testing hypothesis μ and σ^2.

UNIT-IV: Notion of Non-Parametric test, Different N-P tests; Run test, Sign test, Wilcoxon and Mann-Whitney test, Median test; Derivation of the mean and variance of the above test statistics when null hypothesis is true.

UNIT-V: χ^2 – test for goodness of fit, its asymptotic distribution, description of Kolmogorov-Smirnov test, Tests involving Rank correlation (Kendall's Tau and Spearmans rank Correlation).

Text Books:
Rohatgi, V.K (1984) : Statistical Inference, John Wiley & Sons.
Gibbons, J.D and Chakraborti S (2003) : Non-Parametric Inference, McGraw Hill, 4th Ed. Marcel-Dekkar Inc
Wald (1973) : Sequential Analysis, Dover, Newyork.
Goon, Gupta and Das Gupta: An Outline Statistical Theory, Vol.2, The World Press Pvt.Ltd., Calcutta.

References Books:
Lehmann, E.L (1983) : Testing of Statistical Hypothesis, John Wiley & Sons.

Rao, C.R.(1972) : Linear Statistical Inference and its Applications, 2nd Ed, John Wiley & Sons.
Sidney Siegel (1956) : Non Parametric Statistics for the Behavioral Sciences,McGraw Hill,Tokyo.

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SEMESTER – II

Paper – 2.3: STOCHASTIC PROCESSES

UNIT-I: Introduction to Stochastic processes; classification of Stochastic processes according to state space and time domain. Countable state Markov chains (MC's), Chapman-Kolmogorov equations; calculation of n-step transition probability and its limit. Classification of states, period of a state. Stationary distribution of MC.

UNIT-II: Random walk and gambler's ruin problem; Random walk in one and two dimensions. Gambler's ruin problem, probability of ultimate ruin, expected duration of the game.

UNIT-III: Discrete state space continuous time MC: Poisson process and its properties, birth process, death process and birth and death process.

UNIT-IV: Wiener process as a limit of random walk and some elementary properties of Wiener process. Branching process: Galton-Watson branching process, probability of ultimate extinction, distribution of population size.

UNIT-V: Renewal theory: Elementary renewal theorem and applications. Study of residual and excess life times and their distributions. Stationary process: weakly stationary and strongly stationary processes.

Text Books:
Medhi J. (1994): Stochastic Processes.2nd Ed, New Age, New Delhi
Bhat, B.R. (2000): Stochastic Models: Analysis and Applications, New Age
International India
Basu. A.K.(2003) :Introduction to Stochastic Process,Narosa,Chennai.
Srinivasan S.K and Mehta K.M (1981) : Stochastic Process

References Books:
Adke, S.R. and Manjunath, S.M. (1984): An Introduction to Finite Markov Processes,
Wiley Eastern.
Cinlar, E. (1975): Introduction to Stochastic Processes, Prentice Hall.
Feller, W. (1968): Introduction to Probability and its Applications, Vol. 1, Wiley Eastern
Hoel, P.G… Port, S.G. and Stone, C.J (1972): Introduction to Stochastic Process,
Houghton Miffin & Go.

Karlin, S. and Taylor, H.M. (1975): A First Course in Stochastic Processes, Vol. 1.
Parzen, E. (1962): Stochastic Processes, Holden-Day.

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SEMESTER – II

Paper-2.4: DESIGNS OF EXPERIMENTS

UNIT-I: Principles of designs, analysis of variance and analysis of Co-variance, fixed and random effect models. Contrasts. Model Adequacy checking: Test for Normality, Test for equality of Variances (Bartlett test, Modified Levene method)

UNIT-II: C.R.D., R.B.D., Estimation of parametric functions and tests of hypothesis. Comparison of their efficiencies. Missing plot techniques, testing the equality of subsets of block effects or treatment effects. Multiple comparisons tests: Tukey's test, The Fisher Least significant Difference (LSD) method, Duncans Multiple range test.

UNIT-III: L.S.D., Orthogonality in L.S.D., Missing plot technique, Analysis of spilt plot design.

UNIT-IV: Factorial Designs: Analysis of 2^n and 3^2 designs. Estimation of factorial effects. Testing their significance, Total and Partial confounding.

UNIT-V: Youden Square design, intra block analysis. B.I.B.D., P.B.I.B.D., their analysis - estimation of parameters, tests of hypothesis.

Text Books:
Das. M.N. and Giri, N.C.: Design and Analysis of Experiments, New Age International (P) Ltd.
Montgomery, D.C.: Design and Analysis of Experiments, John Wiley & Sons, New York.

References Books:
Cochran & Cox: Experimental Designs, Asia Publishing House, Bombay.
Oscar Kempthorne (1975): The Design and Analysis of Experiments, Wiley – Eastern Pvt. Ltd, New Delhi.

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SEMESTER – III

Paper – 3.1: COMPUTER ORGANISATION AND ARCHITECTURE

UNIT-I: Number Systems, Binary, Octal, Hexadecimal systems, binary arithmetic, Character codes,

UNIT-II: Error detection, correction logic gates, simplification of Boolean expressions, half and full adders,

UNIT-II: Multiplexer, decorder, encoder, flip flops, counters CPU organization, Instruction formats, addressing modes, Fetch, indirect execution cycles.

UNIT-IV: IO architecture, programs controlled, interrupts DMA transfers. Priority interrupts.

UNIT-V: Memory organization, Hierarchy, cache, associative, Virtual Memory, Demand paging concepts.

Reference Books:
Moris Mano: Computer Organization and Architecture, Pearson Education, New Delhi.
Moris Mano: Digital Logic Design, Pearson Education, New Delhi.

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SEMESTER – III

Paper – 3.2: DATA STRUCTURES USING "C"

UNIT-I: Introduction to Algorithms, Deterministic, Non deterministic, Random algorithms. Principles of programming methodology, stepwise refinement, concepts of structured programming, Efficiency of algorithms. Salient features of recursion and iteration.

UNIT-II: Introduction to data structures, classification, linear arrays, One way, Two way linked lists, circular linked lists. Operations such as traversal, insertion, deletion, searching. Algorithms for binary search, merging of sorted arrays.

UNIT-III: Linear and linked representations of stacks and queues, circular queues, Queues and priority queues. Applications such as Conversion of infix to postfix expression, evaluation of expressions. Conversion of recursion to non recursion, etc. Garbage collection. Hashing and collision resolution methods.

UNIT-IV: Trees, Traversal algorithms, binary search tree, Heap, conversion of a general tree to binary tree, Thread tree, Btree applications, tiries.

Graphs and applications, linear, linked Representation, power matrices, Graph traversals such as BFS, DFS, Prim's, Kruskal algorithms for Minimum Spanning tree construction. Warshal algorithm and Floyd algorithms.

UNIT-V: Programming the sorting problems such as Bubble, insertion, selection, Quick sort, Merge sort.

Time complexity of sorting, searching algorithms.

Reference Books:
Horowitz and Sahni: Data Structures, Galgotia Pub.
Tanenbaurm et.al.: Data Structures Using C, Prentice Hall India, Ltd.

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SEMESTER – III

Paper – 3.3: CLIENT SERVER TECHNOLOGY AND APPLICATIONS

UNIT-I: Evolution of corporate computing models, Mainframe, mini, personal network, file server models.

Benefits of client server model and its scalability.

UNIT-II: The server in client server, Data base servers, Oracle Database, Tables, Views, Table spaces, Data integrity, Encoding the data integrity, Managing the data concurrency, ensuring the data security.

UNIT-III: The client in client server, User interlaces, CUI, GUI interfaces, OOPS concepts. Between client and server the networking issues, Middle ware, types of middleware such as DCE, RPC, MOM object oriented development with client server, DML, DDL, DCL statements of SQL, constraints such as primary and foreign key, SQL functions, nested queries, role of a DBA.

UNIT-IV: Structure of relational and object oriented databases, Code Rules, Normalization principles, De-normalization, ER modeling. Introduction to Web databases, data mining and data warehousing.

PL/SQL programming, Loops, control structures, Cursors, database triggers, procedures, functions and packages. Security considerations in database management systems.

UNIT-V: Oracle Forms, Features, Designing a form from a single table, Designing a Master detail form, GUI elements such as text box, Button, radio, check box and Event triggers.

Oracle reports, preparation of a report from a single table, Master detail report, adding title, page No. to reports, Summary reports, formulae tool.

Reference Books:
Steven M. Bobrowski, Syubex: Oracle, Client server Computing,1994.
David Vaskevitch, Comdex: Client Server Strategies, 1995.
Oracle, 8.0, Oracle Press, 1998.
Client Server Application Development Through Developer 2000, SAMS, 1998.

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SEMESTER – III

Paper – 3.4: OBJECT ORIENTED PROGRAMMING IN C^{++} AND UNIFIED MODELLING LANGUAGE

UNIT-I: Object oriented programming principles, Declaration of classes, array of classes, Pointer to classes, constructors such as void constructor, copy constructor, Destructor, friend functions, inline functions, static class members, this pointer.

UNIT-II: Single, Multiple inheritance, Types of derivation such as public, private, protected inheritance and member access controls, ambiguity in inheritance, Virtual base class, container classes. Function Overloading, Operator Overloading, Overloading of assignment, binary, unary operators.

UNIT-III: Polymorphism, Early binding, virtual functions, Late binding, pure virtual functions, abstract base classes, constructor under inheritance, destructor under inheritance, virtual destructors. Templates and Exception Handling. Data File operations, structures and file operations, classes and file operations.

UNIT-IV: Introduction to UML, Use case Diagrams, State diagrams, Sequence diagrams, collaboration diagrams, activity diagrams, component and deployment diagrams, understanding aggregations, composites and interfaces, realizations. Modeling tools for UML.

UNIT-V: Performing domain analysis, gathering system requirement, understanding design patterns.

Reference Books:
Deital & Deital: C^{++}, Prentice-Hall Inc.
Sinan Si Alhir, Oreilly: UML

Paper – 4.1: FORECASTING METHODS

UNIT-I: Smoothing Methods: Averaging methods, exponential smoothing methods, other smoothing methods, a comparison of methods, general aspects of smoothing methods.

UNIT-II: Decomposition Methods: Trend fitting, the ratio-to-moving averages, classical decomposition method, different types of moving averages.

UNIT-III: Models for time series data: Autocovariance and autocorrelation functions, stationary processes, white noise processes, Moving average (MA) processes, Auto Regressive (AR) processes, Auto Regressive and Moving Average (ARMA) processes. Auto Regressive Integrated and Moving Average (ARIMA) processes.
.
UNIT-II: Box - Jenknis Models: Identification, Estimation and diagnostic checking for the models. Simulation and Monto-Carlo methods.

UNIT-V: Application of Time-Series analysis: Determining randomness of data examining stationarity of a time series, removing non-stationarity in a time series, Recognizing seasonality in a time-series.

References Books:
Makridakis, S., Wheel Wright S.C., and McGee V.E.: Forecasting Methods and Applications.
Chatifield: Time-Series Analysis, Chapman & Hall.
Montgomery, Johnson & Gardiner: Forecasting and Time Series Analysis, McGraw Hill.

Paper – 4.2: VISUAL APPLICATION DEVELOPMENT

UNIT-I: Visual programming advantages, Event driven code, Data types, arrays, user defined data types, passing variables to procedures, understanding the scope and life of variables.

UNIT-II: Creating forms, form properties, visual basic tools and customizing the tool box, Displaying the text, button, list, dropdown, check box, radio, frame controls. Control arrays, handling mouse events, key board events, visual basic debugging tools.

UNIT-III: Understanding the COM, COM component software architecture, benefit of COM interfaces, Component object library, Component object servers.

Reading, writing the text files, creation, deletion, copying the files. Crystal reports, Report creation, changing the properties at runtime.

UNIT-IV: Object linking and Embedding, OLE Storage, Creating active document server, OL Drag arid Drop.
Data control, Navigating the data control, Creating Queries in visual basic, Jet DAC, using the record set ODBC, RDO creating applications, working with data bound control.

UNIT-V: Creating intranet applications, understanding the client side, server side scripting, creation of ASP pages.

References Books:
Steven Holzner : Visual Basic 6 Programming- Black Book, Dream Tech.
Peter Norton and Michael Groh; Peter Norton's Guide to Visual Basic 6, Tech Media

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SEMESTER – IV

Paper – 4.3: DISTRIBUTED JAVA OBJECTS

UNIT-I: Distributed object computing, TCP/IP concepts, Object oriented analysis and design, Design architectures, client server and distributed architectures, Design patterns, factory, observer, callback patterns.

UNIT-II: Java overview, Standlone, Applets, AWT and Swing based GUI, Multithreading, Interfaces, Delegation event modelling, IO Streams.

UNIT-III: Java Networking, Sockets, Datagrams, security, JDBC.

UNIT-IV: Connectivity, Java help, Java mail, skeletons, Remote reference layer, RMI based software agents.

UNIT-V: Introduction to CORBA, COM, DCOM approaches to distribute computing.

References Books:

Bill McGarty: Java Distributed Objects, Techmedia.

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SEMESTER – IV

Paper – 4.4: VB.NET

UNIT-I: Data bases: Access databases: Database file, tables, queries, SQL server databases: Data files, log files; Oracle databases: Data files, redo log files, control files, temp files, password files; Relational databases design: Normalization.

UNIT-II: Introduction ADO.NET: Overview: Architecture, components; connection class: Common constructors, opening a connection, closing a connection, command class, Data Adapter class, Data reader class.

UNIT-III: Visual Studio: NET Data Wizards: Odbc data adapter wizard-creating a ODBE Connection, Building a SELECT query, generating a data set, filling a data set; OLEDB Data adapter wizard: SQL and Oracle data adapter wizards.

UNIT-IV: SQL and queries for Access: Dynamic connections: Building a connection string, Opening, closing, checking connection state; in-line SQL, Access queries, selecting data in access, Inserting, updating.

UNIT-V: Deleting, migrating data in Access. Stored procedures and views for SQL server and Oracle: Stored procedures- Oracle Packages, views-creating a view.
Accessing data in ASP.NET. Selecting and displaying data, Web form data grid Control.

References Books:
VB.NET Professional Black Book, NY
Beginning VB.NET: Thearon Willis, Wiley, India.
Microsoft ADO.NET: Riordon, Microsoft Press
Introducing Microsoft ASP.NET, Prentice Hall of India.