BBAI501 HUMAN VALUES AND PROFESSIONAL ETHICS

SUBJECT CODE	SUBJECT NAME	TEACHING & EVALUATION SCHEME								
		THEORY			PRACTICAL		L	T	P	CREDITS
		END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
BBAI501	Human Values and Professional Ethics	60	20	20	-	-	4	-	-	4

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit;
***Teacher Assessment** shall be based on following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

Course Objectives

The objective of the course is to disseminate the theory and practice of moral code of conduct and familiarize the students with the concepts of "right" and "good" in individual, social and professional context

Course Outcomes

1. Help the learners to determine what action or life is best to do or live.
2. Right conduct and good life.
3. To equip students with understanding of the ethical philosophies, principles, models that directly and indirectly affect business.

COURSE CONTENT

Unit I: Human Value

1. Definition, Essence, Features and Sources
2. Sources and Classification
3. Hierarchy of Values
4. Values Across Culture

Unit II: Morality

1. Definition, Moral Behaviour and Systems
2. Characteristics of Moral Standards
3. Values Vs Ethics Vs Morality
4. Impression Formation and Management

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Unit III: Leadership in Indian Ethical Perspective.

1. Leadership, Characteristics
2. Leadership in Business (Styles), Types of Leadership (Scriptural, Political, Business and Charismatic)
3. Leadership Behaviour, Leadership Transformation in terms of Shastras (Upanihads, Smritis and Manu-smriti).

Unit IV: Human Behavior – Indian Thoughts

1. Business Ethics its meaning and definition
2. Types, Objectives, Sources, Relevance in Business organisations.
3. Theories of Ethics, Codes of Ethics

Unit V: Globalization and Ethics

1. Sources of Indian Ethos & its impact on human behavior
2. Corporate Citizenship and Social Responsibility – Concept (in Business),
3. Work Ethics and factors affecting work Ethics.

Suggested Readings

1. Beteille, Andre (1991). ***Society and Politics in India***. Athlone Press:New Jersey.
2. Chakraborty, S. K. (1999). ***Values and Ethics for Organizations***. oxford university press
3. Fernando, A.C. (2009). ***Business Ethics - An Indian Perspective*** .India: Pearson Education: India
4. Fleddermann, Charles D. (2012). ***Engineering Ethics***. New Jersey: Pearson Education / Prentice Hall.
5. Boatright, John R (2012). ***Ethics and the Conduct of Business.***Pearson. Education: New Delhi.
6. Crane, Andrew and Matten, Dirk (2015). ***Business Ethics***. Oxford University Press Inc:New York.
7. Murthy, C.S.V. (2016). Business ***Ethics – Text and Cases***. Himalaya Publishing House Pvt. Ltd:Mumbai
8. Naagrajan, R.R (2016). ***Professional Ethics and Human Values***. New Age International Publications:New Delhi.

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B. Sc. Physics Hons

IV Sem

Subject Code	Category	Subject Name	Teaching and Evaluation Scheme								
			Theory			Practical		Th	T	P	CREDITS
			End Sem University Exam	Two Term Exam	Teachers Assessment	End Sem University Exam	Teachers Assessment				
BSPHPH 402	DC	Electrostatics, Magnetostatics and Electrodynamics	60	20	20	30	20	4	1	0	5

Course Objectives	1. To develop the comprehensive understanding of laws of physics related to Electrostatics, Magnetostatics and Electrodynamics and ability to apply them for laying the foundation for research and development. 2. To work ethically as member as well as leader in a diverse team.
Course Ourcomes	1. Student will be able to understand and solve the problems related to Electrostatics, Magnetostatics and Electrodynamics. 2. Student will be able to determine physical parameter experimentally with optimal usage of resources and complete the assignments in time.

Abbreviation		**Teacher Assessment (Theory) shall be based on following components: Quiz / Assignment/ Project / Participation in class (Given that no component shall be exceed 10 Marks).**
Th	Theory	
T	Tutorial	**Teacher Assessment (Practical) shall be based on following components: Viva / File / Participation in Lab work (Given that no component shall be exceed 50% of Marks).**
P	Practical	

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BSPHPH 402: Electrostatics, Magnetostatics and Electrodynamics

UNIT I: Electrostatics

Coulombs law, calculations of electric field E for simple distributions of charge at rest, dipole and quadruple fields. Work done on a charge in an electrostatic field, conservative nature of the electrostatic field, Relation between electric field and electric potential, torque on a dipole in a uniform electric field and its energy. flux of the electric field. Gauss's law and its application, Capacitors, conducting sphere in a uniform electric field, point charge in front of a grounded infinite conductor. Dielectrics, parallel plate capacitor with a dielectric. dielectric constant. polarization and polarization vector P, relation between displacement vector D, E and P.

UNIT II: Magnetostatics

Force on a moving charge. Lorentz force equation and definition of B, force on a straight conductor carrying current in a uniform magnetic field, torque on a current loop, magnetic dipole moment, angular momentum and gyromagnetic ratio. Biot and Savart's law. calculation of H for simple geometrical situations such as Solenoid, Anchor ring. Ampere's Law, $\nabla \times B = \mu_0 J$, $\nabla . B = 0$. Field due to a magnetic dipole, free and bound currents, magnetization vector (M), relationship between B, H and M. Derivation of the relation $\nabla \times M$.

UNIT III: Current Electricity

Steady current, current density J, non-steady currents and continuity equation. Kirchoff's laws and analysis of multiloop circuits. growth and decay of current in LR and CR circuits, decay constants. LCR circuits. AC circuits. complex numbers and their applications in solving AC circuits problems. complex impedance and reactance, scries and parallelresonance. Q-factor, power consumed by an A.C. circuit, power factor, Y and ∇ network and transmission of electric power.

UNIT IV: Motion of Charged Particles

E as an accelerating field, electron gun, discharge tube, linear accelerator, E as deflecting field, Principle and working of cyclotron, CRO, Sensitivity of CRO, Transverse B field, 180

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deflection, Mass spectrograph (Bainbridge Mass spectrograph), Discovery of isotopes, curvatures of tracks for energy determination for nuclear particles, Mutually parallel E & B fields; Positive ray parabolas, Discovery of isotopes, principle of magnetic focusing (lenses).

UNIT V: Electrodynamics

Electromagnetic induction, Faraday's Laws, Electromotive force, integral and differential forms of Faraday's laws. Self and mutual inductance. Transformers. Energy in a static magnetic field, Maxwell's displacement current. Derivations of Maxwell's equations, Electromagnetic field energy density. Poynting vector. Electromagnetic wave equation. Plane electromagnetic waves in vacuum and dielectric media, Reflection at a plane boundary of dielectrics.

REFERENCES

1. Berkley Physics Course. Electricity and Magnetism Ed. E. M. Purcell Mcgraw Hill
2. Physics Volume 2, D. Halliday and R. Resnick
3. Introduction to Electrodynamics: D. J. Griffiths, 4" Edition, Printice Hall.
4. Electricity and Magnetism: S. S$. Atwood Dover.
5. Electrodynamics: Emi Cossor and Bassin Lorraine. Asahi Shimbunsha Publishing Ltd.

List of Experiments

1. To study Series and Parallel resonance circuit.
2. Charging and discharging of capacitor through resistance.
3. Measurement of frequency of AC mains by electrically maintained vibrating rod.
4. Growth and decay of current in LR.
5. Verification of thevenin theorem.
6. Verification of Norton theorem.
7. Verfication of superposition theorem.
8. Verfication of maximum power transfer theorem.
9. Conversion of Galvanometer to Voltmer and its caliberation.
10. To study of Lissaju figure using CRO.
11. To study of magnetic field due to current using Tangent Galvanometer.

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12. Sensitivity of Cathod Ray Oscilloscope.
13. To plot equation of state and Vander-wall equation with temperature using M.S. Excel / C++.
14. To compare Maxwell-Boltzmann, Bose-Einstein and Fermi-Dirac distribution function Vs temperature using M. S. Excel / C++.
15. To determination of Impedence of LCR circuit.

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B. Sc. Physics Hons

IV Sem

Subject Code	Category	Subject Name	Teaching and Evaluation Scheme								
			Theory			Practical		Th	T	P	CREDITS
			End Sem University Exam	Two Term Exam	Teachers Assessment	End Sem University Exam	Teachers Assessment				
BSPHPH 403	DC	Statistical Mechanics	60	20	20	0	0	4	1	0	5

Course Objectives	1. To develop the comprehensive understanding of laws of physics related to Statistical Mechanics and ability to apply them for laying the foundation for research and development. 2. To work ethically as member as well as leader in a diverse team.
Course Ourcomes	1. Student will be able to understand and solve the problems related to Statistical Mechanics. 2. Student will be able to determine physical parameter experimentally with optimal usage of resources and complete the assignments in time.

Abbreviation		
Th	Theory	**Teacher Assessment (Theory) shall be based on following components: Quiz / Assignment/ Project / Participation in class (Given that no component shall be exceed 10 Marks).**
T	Tutorial	**Teacher Assessment (Practical) shall be based on following components: Viva / File / Participation in Lab work (Given that no component shall be exceed 50% of Marks).**
P	Practical	

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BSPHPH 403: Statistical Mechanics

UNIT I System, Ensemble, Canonical ensemble, Micro-canonical ensemble, Macro state, Microstate, Thermodynamic Probability, Constraints, Accessible and Non-accessible Microstates, Concept of Phase-Space, μ-Space and γ-Space, Negative Temperature, Fundamental Postulates of Statistical Mechanics, Determination of β parameter thermodynamically, Entropy, Partition function, Statistical Interpretation of Entropy and Boltzmann's Entropy-Probability Relation $S = k \log W$.

UNIT II Maxwell Boltzmann's Canonical Distribution Law, Gibb's paradox. Maxwell-Boltzmann's Law of Distribution of Velocities, Discussion of the velocity distribution function, Maxwell-Boltzmann's Law of Distribution of Speed (Most probable speed, Number of molecules corresponding to maximum probable speed, Mean speed, Root mean square speed and their relations) and Droppler's Broadening of Spectral Lines.

UNIT III Radiation, Emissivity, Spectral Distribution of Black Body Radiation, Prevost's Theory of Exchange, Kirchoff's Law and its significance, Wien's Distribution Law, Wien's Displacement Law. Rayleigh-Jean's Law. Stefan-Boltzmann Law, Ultraviolet Catastrophe and Planck's Quantum Postulates. Experimental verification of (1) Wien's Distribution Law (2) Wien's Displacement Law, (3) Rayleigh-Jean's Law and (4) Stefan-Boltzmann Law.

UNIT IV B-E distribution law. Thermodynamic functions of a Completely Degenerate Bose Gas. Bose-Einstein condensation, properties of liquid He (qualitative description). Radiation as photon gas. Bose's derivation of Planck's law.

UNIT V Fermi-Dirac Distribution Law. 'h' as a Natural Constant Thermodynamic functions of an ideal Completely Degenerate, Fermi Gas. Fermi Energy. Electron gas in a Metal, Specific Heat of Metals. White Dwarf Stars. Chandrasekhar Mass Limit and In distinguishability of Particles and its Consequences.

REFERENCES

1. Statistical Physics : Berkeley Physics Course Volume 5 by F Reif (Tata McGraw-Hill Company Ltd).

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2. Statistical and Thermal Physics: an introduction by S.Lokanathan and R.S.Gambhir. (P.H.I.).
3. Statistical Mechanics by R. K. Patharia.(Oxford: Butterworth).
4. Statistical Mechanics by K. Huang (Wiley)
5. Statistical Mechanics by eyringeyringeyring
6. Unified Physics by R. P. Goyal.
7. Thermodynamics, Kinetic theory & Statistical thermodynamics, F.W.Sears and
8. G.L. Salinger, Narosa University Physics, Ronald Lane Reese, Thomson Brooks/Cole.

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Name of the Program: B. Sc. (Honours)

SUBJECT CODE	Category	SUBJECT NAME	TEACHING & EVALUATION SCHEME								
			THEORY			PRACTICAL		Th	T	P	CREDITS
			END SEM	MST	Q/A	END SEM	Q/A				
BSHMA 404	Hons	MATHEMATICS – IV (Numerical Methods & Linear Programming)	60	20	20	-	-	4	1	-	5

Course Objective

To introduce the students with the Fundamentals of the Numerical Methods & Linear Programming.

Course Outcomes

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

1. *understand and apply the basics of the Calculus of Finite Difference.*
2. *Interpolate and Extrapolate values.*
3. *apply the techniques to find the Numerical Integration.*
4. *know the principles of the Linear Programming Problems.*
5. *understand and apply the Optimization Techniques.*

Course Content:

BSHMA 401: MATHEMATICS – IV (Numerical Methods & Linear Programming)

UNIT – I

Numerical Methods: Approximate numbers, Significant figures, Rounding off numbers. Error – Absolute, Relative and Percentage.**Operators** - Δ , ∇ and E (Definitions and some relations among them). **Interpolation:** The problem of Interpolation, Equispaced arguments –Difference Tables, Deduction of Newton's Forward Interpolation Formula. Remainder term (expression only). Newton's Backward Interpolation formula (statement only) with remainder term.

UNIT – II

Unequally – spaced arguments –Lagrange's Interpolation Formula (statement only). Numerical problems on Interpolation with both equi- and unequally-spaced arguments. **Number Integration :** Trapezoidal and Simpson's ⅓rd formula (statement only). Problems on Numerical Integration.

UNIT – III

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Solution of Numerical Equation: To find a real root of an algebraic or transcendental equation. Location of root (Tabular method), Bisection method. Newton-Raphson method with geometrical significance. Numerical problems. (Note : emphasis should be given on problems)

UNIT – IV

Linear Programming: Motivation of Linear Programming problem. Statement of L.P.P. formulation of L.P.P. Slack and Surplus variables. L.P.P. is matrix form. Convex set, Hyperplane, Extreme points, Convex Polyhedron, Basic solutions and Basic Feasible Solutions (B.F.S.) Degenerate and Non-degenerate B.F.S. The set of all feasible solutions of an L.P.P. is a convex set. The objective function of an L.P.P. assumes its optimal value at an extreme point of the convex set of feasible solutions. A B.F.S. to an L.P.P. corresponds to an extreme point of the convex set of feasible solutions.

UNIT – V

Fundamental Theorem of L.P.P. (Statement only). Reduction of a feasible solution to a B.F.S. Standard form of an L.P.P. Solution by graphical method (for two variables), by simplex method and method of penalty. Concept of duality. Duality theory. The dual of the dual is the primal. Relation between the objective values of dual and the primal problems. Dual problems with at most one unrestricted variable, one constraint of equality. Transportation and Assignment problem and their optimal solutions.

BOOKS:

1. Numerical methods – E. Balagurusamy (Tata McGraw Hill).
2. Introduction to numerical analysis – F. B. Hilderbrand (TMH Edition).
3. Numerical Analysis – J. Scarborough.
4. Introduction to numerical analysis – Carl Erik Froberg (Addison Wesley Publishing).
5. Numerical methods for science and engineering – R. G. Stanton (Prentice Hall).
6. Linear Programming : Method and Application – S. I. Gass.
7 Linear Programming – G. Hadley.
8. An Introduction to Linear Programming & Theory of Games – S. Vajda.

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B.Sc. (Honours)

Semester IV (B.Sc. Honours) Chemistry Syllabus for Physics & Maths Honours

SUBJECT CODE	Category	SUBJECT NAME	TEACHING & EVALUATION SCHEME								
			THEORY			PRACTICAL		Th	T	P	CREDITS
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
BSHCH 405	HONS	ADVANCE CONCEPT OF GENERAL CHEMISTRY - II	60	20	20	0	0	4	0	0	4

Legends: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical; C - Credit; Q/A – Quiz/Assignment/Attendance, MST Mid Sem Test.
*Teacher Assessment shall be based on following components: Quiz/Assignment/Project/ Participation in class, given that no component shall exceed more than 10 marks.

Course Objective:

(i) To develop the understanding of fundamentals of Organic, Inorganic and Physical Chemistry.
(ii) To give knowledge of Chemistry.

Course Outcomes:

After completion of the course the students will be able to understand:
Fundamentals & applications of Organic, Inorganic and Physical Chemistry.

ADVANCE CONCEPT OF GENERAL CHEMISTRY - II

Unit I: Carbonyl Compounds:

Structure, reactivity and preparation: Nucleophilic additions, Nucleophilic addition-elimination reactions with ammonia derivatives with mechanism: Mechanisms of Aldol and Benzoin condensation, Knoevenagel condensation, Claisan-Schmidt, Perkin, Cannizzaro and Wittig reaction. Beckmann and Benzil-Benzilic acid rearrangements, haloform reaction and Baeyer Villiger oxidation, α-substitution reactions, oxidations and reductions (Clemmensen, Wolff-Kishner, LiAlH4, NaBH4, MPV, PDC and PGC); Addition reactions of unsaturated carbonyl compounds: Michael addition. Active methylene compounds: Keto-enol tautomerism. Preparation and synthetic applications of diethyl malonate and ethyl acetoacetate:

Unit II: Carbohydrates

Occurrence, classification and their biological importance Monosaccharides: Constitution and absolute configuration of glucose and fructose, epimers and anomers, mutarotation, determination of ring size of glucose and fructose, Haworth projections and conformational structures; Interconversions of aldoses and ketoses; Killiani-Fischer synthesis and Ruff degradation; Disaccharides – Structure elucidation of maltose, lactose and sucrose Polysaccharides – Elementary treatment of starch, cellulose and glycogen.

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Unit III : Chemical thermodynamics:
Intensive and extensive variables: state and path functions: isolated, closed and open systems; zeroth law of thermodynamics.
First law: Concept of heat, q, work, w, internal energy U and statement of first law; enthalpy, H, relation between heat capacities, calculations of q, w, U and H for reversible, irreversible and free expansion of gases (ideal and van der Waals) under isothermal and adiabatic conditions.
Second Law: Concept of entropy; thermodynamic scale of temperature, statement of the second law of thermodynamics; molecular and statistical interpretation of entropy. Calculation of entropy change for reversible and irreversible processes.

Unit IV: Electrochemistry
Quantitative aspects of Faraday's laws of electrolysis, rules of oxidation/reduction of ions based on half-wave potentials, applications of electrolysis in metallurgy and industry. Chemical cells, reversible and irreversible cells with examples. Electromotive force of a cell and its measurement. Nernst equation; Standard electrode (reduction) potential and its application to
different kinds of half-cells. Qualitative discussion of potentiometric titrations (acid-base, redox, precipitation).

Unit V: Coordination Chemistry
Werner's theory, valence bond theory (inner and outer orbital complexes), Electro neutrality principle and back bonding. Crystal field theory. Octahedral vs. tetrahedral coordination, tetragonal distortions from octahedral geometry Jahn-Teller theorem, square planar geometry. Qualitative aspect of Ligand field and MO Theory. IUPAC nomenclature of coordination compounds, isomerism in coordination
compounds. Stereochemistry of complexes with 4 and 6 coordination numbers. Chelation.

Books:
1. Atkins, P. W. & Paula, J. de *Atkin's Physical Chemistry* 8th Ed., Oxford University Press.
2. Castellan, G. W. *Physical Chemistry* 4th Ed. Narosa (2004).
3. Engel, T. & Reid, P. *Thermodynamics, Statistical Thermodynamics, & Kinetics* Pearson Education, Inc: New Delhi (2007).
4. McQuarrie, D. A. & Simon, J. D. *Molecular Thermodynamics* Viva Books
5. Morrison, R. T. & Boyd, R. N. *Organic Chemistry*. Dorling Kindersley (India) Pvt. Ltd. (Pearson Education).
6. Finar, I. L. *Organic Chemistry* (*Volume 1*). Dorling Kindersley (India) Pvt. Ltd. (Pearson Education).

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ShriVaishnav Institute of Computer Applications

Name of Program: B.Sc. (Computer Science)

Subject Code	Category	Subject Name	Teaching & Evaluation Scheme								
			Theory			Practical		L	T	P	CREDITS
			End Sem University Exam	Two Term Exam	Teacher Assessment	End Sem University Exam	Teacher Assessment				
BSCS404	Compulsory	Database Management System	60	20	20			3	1	0	4

Legends:L – Lecture; T – Tutorial/Teacher Guided Student Activity; P – Practical; Q/A – Quiz/Assignment/Attendance; MST – Mid Semester Test.
*Teacher Assessment shall be based on following components: Quiz/Assignment/Project/Participation in class activities, given that no component shall exceed more than 10 marks

Course Education Objectives (CEOs):

- To provide a sound introduction to the discipline of database management as a subject in its own right, rather than a compendium of techniques and product specific tools.
- To give a good formal foundation on the relational model of data.
- To present SQL and procedural interfaces to SQL comprehensively.
- To give an introduction to systematic database design approaches covering conceptual design, logical design and an overview of physical design.
- To introduce the concepts of transactions and transaction processing.

Course Outcomes (COs):

- Design any Desktop application using an entity relationship diagrams (ERD) to express requirements and demonstrates skills to model data requirements and create data models.
- Understanding of database systems theory in order to apply that knowledge to any particular database implementation using Structured Query Language (SQL).
- To learn and understand various Database Architectures and Applications.
- Develop an ability to remove data redundancy by translating created relational model into normalized designs.

UNIT-I

Introduction: An overview of database management system, database system Vs file system,Characteristics of database approach, DBMS architecture, data models, schema and instances,data independence.

UNIT II

Data Modelling using Entity Relationship Model: Entity, Entity types, entity set, notation forER diagram, attributes and keys. Concepts of composite, derived and multivalued attributes,Super Key.

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candidate key, primary key, relationships, relation types, weak entities, enhanced E-R and object modelling, Sub Classes:, Super classes, inheritance, specialization andgeneralization.

UNIT – III

Introduction to SQL: Overview, Characteristics of SQL. Advantage of SQL, SQL data typesand literals.

Types of SQL commands: DDL, DML, DCL. Basic SQL Queries.

Logical operators: BETWEEN, IN, AND, OR and NOT

Null Values: Disallowing Null Values, Comparisons Using Null Values

Integrity constraints: Primary Key, Not NULL, Unique, Check, Referential key Introduction to Nested Queries, Correlated Nested Queries, Set-Comparison Operators,Aggregate Operators: The GROUP BY and HAVING Clauses,

Joins: Inner joins, Outer Joins, Left outer, Right outer, full outer joins.Overview of views and indexes.

UNIT – IV

Relational Data Model: Relational model terminology domains, Attributes, Tuples, Relations,characteristics of relations, relational constraints domain constraints, key constraints andconstraints on null, relational DB schema.Codd's Rules.

Relational algebra: Basic operations selection and projection,Set Theoretic operations Union, Intersection, set difference and division,

Join operations: Inner,Outer, Left outer, Right outer and full outer join.

UNIT V

ER to relational Mapping: Data base design using ER to relational language.

Data Normalization: Functional dependencies, Armstrong's inference rule, Normal form up to 3rd normal form.

TEXT BOOKS:

1. R. Elmarsi and SB Navathe, "Fundamentals of Database Systems", Pearson,6th ed.
2. Singh S.K., "Database System Concepts, design and application", Pearson Education
3. Ramakrishnan and Gherke, "Database Management Systems", TMH.

REFERENCE BOOKS:

1. Abraham Silberschatz, Henry Korth, S. Sudarshan, "Database Systems Concepts", 4th Edition, McGraw Hill, 1997.
2. Jim Melton, Alan Simon, "Understanding the new SQL: A complete Guide", MorganKaufmann Publishers, 1993.
3. A.K. Majumdar, P. Battacharya, "Data Base Management Systems", TMH, 1996.
4. Bipin Desai, "An Introduction to database Systems", Galgotia Publications, 2012.

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