B.TECH. III Semester-VI	L	T	P	C
CS 601: Introduction to machine learning	3	0	2	4

INTRODUCTION TO MACHINE LEARNING	12 Hours
Introduction: Machine learning, Terminologies in machine learning, Types of machine learning, designing a learning system, Application of machine learning.	
SUPERVISED, UNSUPERVISED, REINFORCEMENTLEARNING	**12 Hours**
SUPERVISED: Linear Regression, Gradient Descent, Normal Equations, Logistic Regression, Perceptron, classification, Generative Models, Gaussian Discriminant Analysis, Naive Bayes, Kernel Method, SVM, Gaussian Processes. UNSUPERVISED: K-means, Gaussian Mixture Model, Expectation Maximization, Factor Analysis, Principal Components Analysis. REINFORCEMENT LEARNING: Markov Decision Processes, Bellman's Equations, Value Iteration and Policy Iteration, Value Function Approximation, Q-Learning.	
DECISION TREE LEARNING AND CLUSTERING	**12 Hours**
Introduction, Univariate trees like Classification Trees, Regression Trees, Pruning, Rule extraction from trees, Learning Rules from data, Multivariate Trees, Tree Ensembles: Decision trees, Random Forests, Boosting and Gradient Boosting, Issues in Decision Tree Learning. Clustering: Choosing distance metrics, Different clustering approaches, hierarchical agglomerative clustering, k-means Lloyd's algorithm, DBSCAN, Relative merits of each method, clustering tendency and quality.	
OVERVIEW OF DEEP LEARNING	**8 Hours**
INTRODUCTION TO DEEP LEARNING: Deep Neural Network, Restricted Boltzmann machine, Convolution Neural Network, Auto-Encoders, Deep Belief Network, Recurrent Neural Network, Transfer learning.	
Total Contact Time: 42 Hours	

Recommended Books

1. Tom Mitchell, Machine Learning, McGraw-Hill.
2. EthemAlpaydin, "Introduction to Machine Learning", MIT Press, 2004
3. Cathy O'Neil and Rachel Schutt, "Doing Data Science, Straight Talk From The Frontline", O'Reilly, 2014.
4. Joel Grus, "Data Science from Scratch: First Principles with Python", O'Reilly Media, 2015.
5. Wes McKinney, "Python for Data Analysis: Data Wrangling with Pandas, NumPy, and IPython", O'Reilly Media, 2012.

B.TECH. III Semester-V	L	T	P	C
CS 602: High performance computing	3	0	2	4

Introduction to high performance computing	10 Hours
Classes of Computers, Defining Computer Architecture, Trends in Technology, Trends in Power and Energy in Integrated Circuits, Trends in Cost, Dependability, Measuring, Reporting, and Summarizing Performance, Quantitative Principles of Computer Design, Putting It All Together: Performance, Price, and Power, Fallacies and Pitfalls related to parallel architectures, Memory Hierarchy Design: Ten Advanced Optimizations of Cache Performance, Memory Technology and Optimizations, Protection: Virtual Memory and Virtual Machines, Crosscutting Issues: The Design of Memory Hierarchies, Looking Ahead and Historical Perspective.	
Instruction-level parallelism	**12 Hours**
Concepts and Challenges, Basic Compiler Techniques for Exposing ILP, Reducing Branch Costs with Advanced Branch Prediction, Overcoming Data Hazards with Dynamic Scheduling, Dynamic Scheduling: Examples and the Algorithm, Hardware-Based Speculation, Exploiting ILP Using Multiple Issue and Static Scheduling, Exploiting ILP Using Dynamic Scheduling Multiple Issue and Speculation, Advanced Techniques for Instruction Delivery and Speculation, Studies of the Limitations of ILP, Cross-Cutting Issues: ILP Approaches and the Memory System, Multithreading: Exploiting Thread-Level Parallelism to Improve Uniprocessor Throughput.	
Data-level and thread-level parallelism	**10 Hours**
Vector Architecture, SIMD Instruction Set Extensions for Multimedia, Graphics Processing Units, Detecting and Enhancing Loop-Level Parallelism, Crosscutting Issues, Putting It All Together: Mobile versus Server GPUs and Tesla versus Core i7, Centralized Shared-Memory Architectures, Performance of Symmetric Shared-Memory Multiprocessors, Distributed Shared-Memory and Directory-Based Coherence, Synchronization: The Basics Models of Memory Consistency.	
Case studies	**10 Hours**
Intel i3, i5, i7 processor cores, NVIDIA GPUs, AMD, ARM processor cores, Simulators, GEM-5, CACTI, SIMICS, Multi2sim and Intel Software development tools.	
Total Contact Time: 42 Hours	

Recommended Books

1. David.A.Patterson, John L.Hennessy, "Computer Architecture: A Quantitative approach", Elsevier, 6th Edition 2019.
2. K.Hwang, NareshJotwani, “Advanced Computer Architecture, Parallelism, Scalability, Programmability”, Tata McGraw Hill, 2 nd Edition 2010.
3. An Introduction to Parallel Programming, Peter S. Pacheco, 2011, 1st Edition, Morgan Kaufmann Publishers,Print Book ISBN:9780123742605 eBook ISBN:9780080921440.
4. An Introduction to General-Purpose GPU Programming, Jason Sanders and Edward Kandrot, 2011, 1stEdition, Addison-Wesley Professional, ISBN-13: 9780131387683.

B.TECH. III Semester-VI	L	T	P	C
CS 603 : Web engineering	3	0	2	4

HTML, Javascript, JQuery	10 Hours

Introduction to Web Engineering, Web Programming vs. Web Engineering, Introduction to Web: HTTP, URL, Web Browser, Web Server, SMTP Server, ISP, Hyperlink, DNS, XML, Parsers and Internet based services, Web Architecture, An Overview about HTML (Basic Tags), HTML5 forms, GET and POST data, Introduction to Cascading style sheets, CSS3 Properties (BOX model, Advance Selectors), Responsive Designs, Need of responsive designs (bootstrap), Introduction to Javascript and jquery, Angular JS (A Client Side MVC framework).

Php, Database Connectivity	10 Hours

Introduction to PHP, Associative arrays, Include, require, header, Developing Dynamic Content/Web page using PHP, Sessions and Cookies, Database Connectivity Using PHP and Insert Record into Database, Update, Delete and View Records from Database, Building a CRUD application, AJAX, How AJAX works, Case Study on Code Management Tool (Github), Secure Web Applications, Usability of web applications, Accessibility of web applications, Introduction to MVC, Model View Controller, Performance Optimization of Web Application.

Php Framework	12 Hours

Introduction to PHP Framework (LARAVEL), MVC Routing, Static and Dynamic Routing, Route Parameters, Named Routes, Route Groups, HTTP Middleware Introduction, Defining Middleware, Registering Middleware, Middleware Parameters, Blade Templates Introduction, Template Inheritance, Defining A Layout, Extending A Layout, Database: Migrations, How to Work on View Section in LARAVEL, Basic Usage, Passing Data To Views, Sharing Data With All Views, Introduction Generating Migrations, Migration Structure, Running Migrations, Rolling Back Migrations, Writing Migrations, Creating Tables, Renaming / Dropping Tables, Database Seeding in LARAVEL, Writing Seeder, Running Seeder.

MVC in LARAVEL, Web Services	10 Hours

MVC Controller in LARAVEL, Introduction Basic Controllers, Controller Middleware, MVC Model and Eloquent ORM in LARAVEL, Getting Started, Relationships, Collections, Introduction to Web Services, Restful Services, Introduction to SOAP Services, SOAP Service Architecture, WSDL with SOAP Service, UDDI with SOAP, Web Application Testing, Test Driven Development(TDD), TDD and Traditional Testing, Introduction to CMS Systems (Wordpress/Magneto).

Recommended Books

1. Web Engineering: A Practitioner's Approach by Roger Pressman and David Lowe, McGraw-Hill, 2009.
2. Web 2.0 Architectures: What Entrepreneurs and Information Architects Need to Know by James Governor, Dion Hinchcliffe, and Duane Nickull, O'Reilly, 2009.
3. Web Engineering: Modelling and Implementing Web Applications: Modelling and Implementing Web Applications.
4. Web Engineering - The Discipline of Systematic Development of Web Applications, GertiKappel, Birgit Proll, Siegfried Reich, Werner Retschitzegger.

B.TECH. III Semester-VI	L	T	P	C
CS 604: ADVANCE DATABASE MANAGMENT	3	0	2	4

Introduction	12 Hours
Features of Distributed versus Centralized Databases, Principles Of Distributed Databases, Levels Of Distribution Transparency, Reference Architecture for Distributed Databases, Types of Data Fragmentation, Integrity Constraints in Distributed Databases. Translation of Global Queries to Fragment Queries, Equivalence Transformations for Queries, Transforming Global Queries into Fragment Queries, Distributed Grouping and Aggregate Functions, Evaluation of Parametric Queries. Optimization of Access Strategies, A Framework for Query Optimization, Join Queries, General Queries. The Management of Distributed Transactions, A Framework for Transaction Management, Supporting Atomicity of Distributed Transactions, Concurrency Control for Distributed Transactions, Architectural Aspects of Distributed Transactions.	
Locking and concurrency control	**12 Hours**
Correctness of interleaved execution, Locking and management of locks, Two Phase Locking, deadlocks, multiple level granularity, Concurrency Control on B+ trees, Concurrency Control, Foundation of Distributed Concurrency Control, Distributed Deadlocks, Concurrency Control based on Timestamps, Optimistic Methods for Distributed Concurrency Control. Reliability, Basic Concepts, Non-blocking Commitment Protocols, Reliability and concurrency Control, Determining a Consistent View of the Network, Detection and Resolution of Inconsistency, Checkpoints and Cold Restart, Distributed Database Administration, Catalogue Management in Distributed Databases, Authorization and Protection.	
Architectures and query execution	**9 Hours**
Architectural Issues, Alternative Client/Server Architectures, Cache Consistency Object Management, Object Identifier Management, Pointer Swizzling, Object Migration, Distributed Object Storage, Object Query Processing, Object Query Processor Architectures, Query Processing Issues, Query Execution, Transaction Management, Transaction Management in Object DBMSs, Transactions as Objects.	
Query optimization and databases	**9 Hours**
Database Integration, Scheme Translation, Scheme Integration, Query Processing Query Processing Layers in Distributed Multi-DBMSs, Query Optimization Issues. Transaction Management Transaction and Computation Model Multi-database Concurrency Control, Multi- database Recovery, Object Orientation And Interoperability Object Management Architecture CORBA and Database Interoperability Distributed Component Model COM/OLE and Database Interoperability, PUSH-Based Technologies. Current trends in No SQL and New SQL data management issues on the cloud, Stream data management.	
Total Contact Time: 42 Hours	

Recommended Books

1. M. Stonebraker, Readings in Database Systems, 4th Edition, MIT Press, 2005.
2. M T Ozsu, Patrick Valduriez, Principles of Distributed Database Systems, Springer, 2011
3. S. Ceri and G. Pelaggati, Distributed Database System Principles and Systems, MGH, 1985.

B.TECH. III Semester-VI	L	T	P	C
CS 631: Mathematical optimization	3	0	0	3

Linear Programming	10 Hours
Basic Problem, Graphical Solution, Simplex Method, Slack Variables, Simplex Method for Resource Requirements, General Constraints, Duality, Duality for Non-standard Linear Programs, Duality Theorems, Sensitivity Analysis, Changes in Objective Function Coefficients, Theory for Simplex Method.	
Unconstrained extrema	**10 Hours**
Mathematical Background, Types of Subsets of R^n, Continuous Functions, Existence of Extrema, Differentiation in Multi-Dimensions, Second Derivative and Taylor's Theorem, Quadratic Forms, Derivative Conditions, First Derivative Conditions, Second Derivative Conditions.	
Constrained extrema	**10 Hours**
Implicit Function Theorem, Extrema with Equality Constraints, Interpretation of Lagrange Multipliers, Extrema with Inequality Constraints: Necessary Conditions, Extrema with Inequality Constraints: Sufficient Conditions, Convex Structures, Karush-Kuhn-Tucker Theorem under Convexity, Rescaled Convex Functions, Global Extrema for Concave Functions, Proof of Karush-Kuhn-Tucker Theorem, Second-Order Conditions for Extrema of Constrained Functions.	
Dynamic programming	**12 Hours**
Parametric Maximization and Correspondences, Budget Correspondence for Commodity Bundles, Existence of a Nash Equilibrium, Finite-Horizon Dynamic Programming, Supremum and Infimum, General Theorems, Infinite-Horizon Dynamic Program, Examples, Theorems for Bounded Reward Function, Theorems for One-Sector Economy, Continuity of Value Function.	
Total Contact Time: 42 Hours	

Recommended Books

1. Russell C. Walker, Introduction to Mathematical Programming, 4th edition, Pearson Learning.
2. R. Clark Robinson, Introduction to Mathematical Optimization, 2013
3. Wayne L. Winston, Operations Research - Applications and algorithms, Fourth edition.
4. Edwin K. P. Chong, Stanislaw H. Zak, An Introduction to optimization, Fourth Edition.

B.TECH. III Semester -VI	L	T	P	C
CS 632: Cloud computing and big data infrastructure	3	0	0	3

Introduction to cloud computing	10 Hours
Overview of Computing like Grid, Cluster, distributed etc., Cloud Computing Vision, Characteristics and Benefits, Challenges of Cloud Computing, Cloud Computing platforms and technologies like Amazon AWS, Google, Facebook, Cloud Computing Architecture: Cloud Computing Reference Model, Service Models, Deployment Models like Public, Private, Hybrid etc, Cloud Computing Challenges, Cloud using open source tools like Eucalyptus, OpenStack.	
Virtualization	**10 Hours**
Introduction to Virtualization, Characteristics of Virtualization, Taxonomy of Virtualization like Machine Level Virtualization, Hardware Level Virtualization like Hypervisors, Hardware Virtualization Techniques like full, para, partial, OS Level Virtualization, Storage, Network and Desktop Virtualization, Advantages and Disadvantages of it, Technologies like Xen, VMWare, Hyper-V.	
Introduction to big data	**6 Hours**
History of Data Management, Evolution of Big Data, 4 V's of Big Data, Types of Data like unstructured, semi structured and structured, Elements of Big Data, Careers and Future in Big Data, Characteristics, Challenges, Features and Applications of Big Data, Use of big data in social networking, preventing fraudulent activities and retail industry.	
Technologies of handling big data	**16 Hours**
Distributed and Parallel Computing for Big Data, Introducing Hadoop, Cloud Computing and Big Data, In-Memory Computing Technology for Big Data, Understanding Hadoop Ecosystem: Hadoop Ecosystem, Hadoop Distributed File System, MapReduce, Introducing HBase, Combining HBase and HDFS, Understanding MapReduce Fundamentals and HBase: The MapReduce Framework, Techniques to Optimize MapReduce Jobs, Uses of MapReduce, Role of HBase in Big Data Processing.	
Total Contact Time: 42 Hours	

Recommended Books

1. Mastering Cloud Computing by RajkumarBuyya, Christian Vecchiola, S.ThamaraiSelvi, McGraw Hill Education (India) Private Limited, 2013
2. Dr. Kumar Saurabh, "Cloud Computing 2nd Kindle Edition", Wile India,2012
3. Big Data, Black Book: Covers Hadoop, MapReduce, Hive, YARN, Pig, R and Data Visualization, Dreamtech Press, 1st Edition, 2016
4. Arvind Sathi, Big Data Analytics: Disruptive Technologies for Changing the Game, MC Press, 2012
5. Tom White, Hadoop: The Definitive Guide, O'Reilly Media, Third Edition, 2012.

B.TECH. III Semester-VI	L	T	P	C
CS 633: Introduction to game design	3	0	0	3

Introduction	10 Hours
History of Video Games, Impact of Games on Society, Introduction to the Class, Role of the Game Designer, Game Design, Game types, Game genres, Game Writing, UI Layout, Asset Management, game state, gamer services and Interactive Storytelling Understanding Hardware, Input Devices, Output Devices, Network Requirements, Managing Game Performance, CPU vs GPU, and Graphics Networking Performance, Dramatic elements of games and Narrative Design, Narrative Game.	
Game design and development	**12 Hours**
Concepts: Mathematical concepts, Collision Detection and resolution, Real-time game Physics, Graphics, System dynamics, Challenge, Skill and Chance, Character Animation, Animate basic characters, Transform objects, Artificial Intelligence Agents, Architecture, and Techniques, Overview of Path finding, Audio Programming, Conceptualization, Communication, Networking and Multiplayer.	
Audio visual design and production	**10 Hours**
Visual Design, 3D Modeling using 3D Studio Max, 3D Environments, 2D Textures and Texture mapping, Special Effects, Lighting, Animation, Cinematography, Audio design and production, Social play Games as culture, Introduction to Unity and 3D games.	
Working with unity and scripting	**10 Hours**
Level design and properties of living things, Functionality, Completeness and Balance, Simple Playtesting and Quality Assurance, Design a board game, Game economies, Black Friday, the board game, Unity Demos, Courses Wiki, Lesson Files, Managing Project, Interface and Assets, Unity Interfaces, Prototyping and Scripting Basics, Collection, Inventory and HUD, Building Unity Game, Terrain, Unity Terrain Assets, Camera, Layer, GUI, Curves, Surfaces, Visible Surface.	
Total Contact Time: 42 Hours	

Recommended Books

1. Steve Rabin, Introduction to Game Development, Cengage Technology (2010).
2. Michael Dawson, Beginning C++ Through Game Programming, Cengage Learning (2010).
3. Kelly C., Programming 2D Games, A K Peters/CRC Press(2012).
4. A. Thorn, Learn Unity for 2D Game Development, Apress, (2013).

B.TECH. III Semester-VI	L	T	P	C
CS 634: Blockchain and ledger	3	0	0	3

Introduction and applications	10 Hours
Introduction, Background and History, Purpose and Scope, Money, Currency, Ledgers, Bitcoin Core, Digital Money to Distributed Ledgers, Fundamental concepts, Major research challenges and technical gaps existing between theory Applications: Medical Record Management System, Domain Name Service, Peer-to-Peer Networking, future of Blockchain, Additional Block chain Considerations.	
Fundamental models	**12 Hours**
The consensus problem - Asynchronous Byzantine Agreement, AAP protocol and its analysis, Nakamoto Consensus on permission-less, nameless, peer-to-peer network Consensus Comparison Matrix, Ledger Conflicts and Resolutions, Forking and Contracts, Smart Contracts, Soft Forks, Hard Forks, Cryptographic Changes and Forks, Abstract Models for blockchains, GARAY model, RLA Model, Proof of Work as random oracle, formal treatment of consistency, liveness and fairness , Proof of Stake based Chains, Hybrid models (Proof of Work + Proof of Stake).	
Cryptography	**10 Hours**
Cryptographic basics for crypto-currency, Introduction to Cryptography, Classic ciphers, Symmetric Cryptography: Hash functions, Hash pointers, Asymmetric Cryptography: Keys & Digital signatures Algorithms, Binary Trees, Merkle trees, Elliptic curves, SHA-256, RIPEMD-160, Base64 and Base58, Cryptographic Nonce, Transactions, Addresses and Address Derivation, Private Key Storage.	
Cryptocurrency	**10 Hours**
Bitcoin, Wallet, Blocks, Merkley Tree, hardness of mining, transaction verifiability, anonymity, forks double spending, mathematical analysis of properties of Bitcoin, Ethereum, Ethereum Virtual Machine, Wallets for Ethereum, Solidity, Smart Contracts, some attacks on smart contracts, zero Knowledge proofs and protocols in Blockchain, Succinct non interactive argument for Knowledge, pairing on Elliptic curves, Zcash.	
Total Contact Time: 42 Hours	

Recommended Books

1. Arvind Narayanan, Joseph Bonneau, Edward Felten, Andrew Miller and Steven Goldfeder, Bitcoin and Cryptocurrency Technologies: A Comprehensive Introduction, Princeton University Press.
2. Dylan Yaga, Peter Mell, Nik Roby, Karen Scarfone, Blockchain Technology Overview, National Institute of Standards and Technology, USA.
3. Antonopoulos, Mastering Bitcoin: Unlocking Digital Cryptocurrencies, First Edition, O'Reilly Media Inc.
4. Melanie Swan, Blockchain - Blueprint for a New Economy, First Edition, O'Reilly Media Inc.

B.TECH. II Semester-6	L	T	P	C
EC 641: Information Theory & Coding	3	0	0	3

Prerequisite
Digital logic design, Communication Engineering, Digital Communication.

1. Information and Sources	10 Hrs
Introduction, The Definition of Information, The Zero-memory Information Source, properties of Entropy, Extension of a Zero-memory Source, The Markov Information Source, The Adjoint Source.	
2. **Source Coding, Channels and Mutual information**	**12 Hrs**
Properties of Codes, Uniquely Decodable Codes, Instantaneous Codes, Construction of an Instantaneous Code, Kraft's Inequality. The Average Length of A Code, A method of Encoding for Special Sources, Shannon's First Theorem, Coding without Extensions, Huffman Codes, Code Efficiency And Redundancy. Introduction, Information Channels, Probability Relations in a Channel, A priori and A Posteriori Entropy, Mutual information, Properties of Mutual Information, Noiseless Channels and Deterministic Channels, Cascaded Channels, Additivity of Mutual Information.	
3. Linear Block Codes	**10 Hrs**
Introduction and basic definitions, Encoding and Decoding of a linear block codes, Syndrome decoding, Perfect Codes, Hamming Codes, Minimum Distance, Error Correction And Error Detection Capabilities.	
4. Cyclic, BCH & Convolution codes	**10 Hrs**
Introduction to Cyclic Codes, Polynomials, Cyclic Code Generation, Quasi-cyclic and Shortened Cyclic Codes, Burst Error Correction, Fire Codes, Golay Codes, BCH Codes, Convolution Codes and Turbo Codes.	
Total Contact Time: 42 Hours	

Recommended Books

1. RanjanBose,"Information theory, coding and cryptography", Tata McGraw-Hill,2nd Edition,2008.
2. Giridhar K, "Information Theory & Coding", Pooja Publications, 2010.
3. Skalar, Digital Communications,
4. Carlson A., Communication Systems, 3rd Ed., McGraw Hill, 1986.
5. Proakis J.J., Digital Communications, 2nd Ed., McGraw Hill, 1989.
6. Blahut R.F., Digital transmission of Information, Addison Wesley 1990.

B.TECH. III Semester-VI	L	T	P	C
CS 641: Augmented and virtual reality	3	0	0	3

Introduction to VR and AR	12 Hours

History of VR and AR, Technology and Features of Augmented Reality, Comparison of AR and VR, Challenges with AR, AR Systems and Functionality, Human factors, Human visual system, Perception of depth, color, contrast, resolution, Stereo Rendering, VR Hardware: Head-coupled displays etc. VR Software, Geometric Modelling: From 2D to 3D, 3D space curves, 3D boundary representation. The Graphics Pipeline and OpenGL, Overview and Transformations, Rotation, translation, scaling, mode view matrix, projection matrix, Lighting and Shading, OpenGL Shading Language (GLSL), GLSL vertex and fragment shaders.

Visual computation in virtual reality	10 Hours

3D Interaction Techniques: 3D Manipulation Techniques and Input Devices, 3D Travel Tasks, Travel Techniques, Theoretical Foundations of Wayfinding, Types of Centred-Wayfinding Support, Evaluating Wayfinding Aids, System Control, Classification, Graphical Menus, Voice Commands, Gestrual Commands, Tools, Muti-modal System Control Techniques, Case Study: Mixing System Control Methods, Symbolic Input Tasks.

Framing using 3D virtual reality	10 Hours

Development Tools and Frameworks in Virtual Reality: VR. X3D Standard; Vega, MultiGen, Virtools etc., World Space, World Coordinate, World Environment, Objects - Geometry, Position / Orientation, Hierarchy, Bounding Volume, Scripts and other attributes, VR Environment - VR Database, Tessellated Data, LODs, Graphical User Interface, Control Panel, 2D Controls.

VR applications	10 Hours

Pose Tracking I, Tracking with light house, Pose Tracking II. Advanced positional tracking, Panoramic Imaging and Cinematic, VR Spatial Sound and the Vestibular System, VR Engines and Other Aspects of VR, Latency, eye tracking, post-rendering warp. The Future: Virtual environment, modes of interaction Application of VR in Digital Entertainment: VR Technology in Film & TV Production. VR Technology in Physical Exercises and Games. Demonstration of Digital, Entertainment by VR.

Recommended Books

1. LaValle "Virtual Reality", Cambridge University Press, 2016.
2. Alan B Craig, William R Sherman and Jeffrey D Will, “Developing Virtual Reality Applications: Foundations of Effective Design”, Morgan Kaufmann, 2009.
3. John Vince, “Virtual Reality Systems “, Pearson Education Asia, 2007.
4. Anand R., “Augmented and Virtual Reality”, Khanna Publishing House, Delhi.