OPERATING SYSTEM
(DCS301)

Objective: To give knowledge about principles of modern operating system.	
Unit	**Topic**
I	**Introduction to Operating Systems:** Role and purpose of operating systems, Operating System Services, Classification of Operating systems, Operating System Structure, System Calls.
II	**CPU Scheduling:** Process vs. Program, Process States, Process Transition Diagram, Process Control Block, Process Address Space, Schedulers, Scheduling Concepts, Performance Criteria, Scheduling Algorithms, Threads, Deadlock Problem, Deadlock Characterization, Deadlock Prevention, Deadlock Avoidance, Deadlock Detection, Recovery from Deadlock, Methods for Deadlock Handling.
III	**Inter-process Communication:** Race conditions, Critical sections, Mutual exclusion, Critical-section problem, Algorithmic approach to implementing critical sections, Hardware support for process synchronization, Semaphores, Mutexes, Monitors. **Classic Problems of Synchronization:** Producers-consumers with bounded buffers problem, Readers-writers problem, Dining-philosophers problem
IV	**Memory Management:** Introduction, Logical and Physical Address Space, Swapping, Contiguous Memory Allocation, Fragmentation, Paging, Structure of Page Table, Segmentation, Segmentation with Paging. Virtual Memory: Demand Paging, Performance of Demand Paging, Page Replacement Algorithms, Allocation of Frames, Thrashing
V	**File system:** File Concept, Access Methods, Directories, Mounting of File-System, File-System Structure, File-System Implementation, Allocation Methods. I/O Devices, and I/O Subsystems, I/O Buffering, Disk Storage and Disk Scheduling, Disk Management, RAID.

Text Book (s) :

1. Abraham Silberschatz, Peter B. Galvin, Greg Gagne, Operating System Concepts, John Wiley.
2. William Stallings, Operating Systems: Internals and Design Principles. PHI,
3. Dhananjay M. Dhamdhere, “Operating Systems A Concept-Based Approach”, TMH
4. Milan Milankovic, “Operating System, Concepts jand Design”, Mc Graw-Hill
5. Harvey M Deital, “Operating System”,addision-Wesley.
6. Richard Peterson, “Linux: The Complete Referece”, Osborne Mc Graw-Hill
7. Parata, “Advanced Unix Programming Guide”, BPB
8. Yashwant Kanitkar, “Unix Shell Programming”, BPB
9. Sumitabh Das, “Unix Concepts and Applicantions”,TMH.

Python Programming
(DCS302)

Objective: To familiarize the students with advanced databases and techniques of retrieving and storing information.	
Unit	**Topic**
I	**Introduction To Python:** Installation and Working with Python Understanding Python variables Python basic Operators Understanding python blocks **Values and Variables :** Integer and String Values, Identifiers, User Input, String Formatting, Expressions and Arithmetic Examples
II	**Python Data Types:** Declaring and using Numeric data types: int, float, complex Using string data type and string operations Defining list and list slicing Use of Tuple data type
III	**Python Conditional Statements and looping:** If, If- else, Nested if-else For, While Nested loops
IV	**Python String, List And Dictionary Manipulations:** Building blocks of python programs, Understanding string in build methods, List manipulation using in build methods ,Dictionary manipulation Programming using string, list and dictionary in build functions
V	**Python Object Oriented Programming:** Oops Concept of class, object and instances Constructor, class attributes and destructors ,Real time use of class in live projects ,Inheritance , overlapping and overloading operators Adding and retrieving dynamic attributes of classes Programming using Oops support..

Text Book (s):

1. Chun, J Wesley, Core Python Programming, Pearson
2. Barry, Paul, Head First Python, O Rielly
3. Lutz, Mark, Learning Python, O Rielly
4. Python for Education –Ajith Kumar B. P., Inter University Accelerator Center, Delhi.
5. Python Training Guide –Mercury Learning & Information USA, BPB Publications.
6. Lutz, Mark, Programming Python: Powerful Object-Oriented Programming, O Rielly

DATA STRUCTURES
(DCS303)

Objective: To enable them to write algorithms for solving problems with the help of fundamental data structures information.	
Unit	**Topic**
I	**Introduction:** Basic Terminologies: Elementary Data Organizations, Data Structure Operations: insertion, deletion, traversal etc.; Analysis of an Algorithm, Asymptotic Notations, Time-Space trade off. **Searching:** Linear Search and Binary Search Techniques and their complexity analysis.
II	**Stacks and Queues**: ADT Stack and its operations: Algorithms and their complexity analysis, Applications of Stacks: Expression Conversion and evaluation – corresponding algorithms and complexity analysis. ADT queue, Types of Queue: Simple Queue, Circular Queue, Priority Queue; Operations on each types of Queues: Algorithms and their analysis.
III	**Linked Lists:** Singly linked lists: Representation in memory, Algorithms of several operations: Traversing, Searching, Insertion into, Deletion from linked list; Linked representation of Stack and Queue, Header nodes, Doubly linked list: operations on it and algorithmic analysis; Circular Linked Lists: all operations their algorithms and the complexity analysis.
IV	**Trees:** Basic Tree Terminologies, Different types of Trees: Binary Tree, Threaded Binary Tree, Binary Search Tree, AVL Tree; Tree operations on each of the trees and their algorithms with complexity analysis. Applications of Binary Trees. B Tree, B+ Tree: definitions, algorithms and analysis.
V	**Sorting and Hashing:** Objective and properties of different sorting algorithms: Selection Sort, Bubble Sort, Insertion Sort, Quick Sort, Merge Sort, Heap Sort; Performance and Comparison among all the methods, Hashing. **Graph:** Basic Terminologies and Representations, Graph search and traversal algorithms and complexity analysis.

Text Book (s):

1. "Fundamentals of Data Structures", Illustrated Edition by Ellis Horowitz, Sartaj Sahni, Computer Science Press.

2. How to Solve it by Computer", 2nd Impression by R.G. Dromey, Pearson Education.

3.Hadley, G., "Linear Programming and Massachusetts", Addison-Wesley

4.Taha, H.A, "Operations Research-An Introduction",Macmillian

5.Hiller, F.S., G.J. Lieberman, "Introduction to Operations Research", Holden-Day

6.Harvey M. Wagner, "Principles of Operations Research with Applications to Managerial Decisions", Prentice Hall of India Pvt.Ltd.

7. Schaum's Series, "Introduction of Data Sructure",Prentice Hall of India.

STATISTICAL ANALYSIS FOR DATA SCIENCE
(DCS304)

Objective: Understand the fundamentals of data science, data handling and statistical analysis issues.	
Unit	**Topic**
I	**Basic Probability:** Probability spaces, conditional probability, independence; Discrete random variables, Independent random variables, the multinomial distribution, Poisson approximation to the binomial distribution, infinite sequences of Bernoulli trials, sums of independent random variables; Expectation of Discrete Random Variables, Variance of a sum, Chebyshev's Inequality.
II	**Probability Distributions**: Continuous random varibales and their properties, distribution functions and densities, normal, exponential and gamma densities. Bivariate distributions and their properties, distribution of sums and quotients, conditional densities, Bayes' rule.
III	**Basic Statistics:** Measures of Central tendency: Moments, skewness and Kurtosis - Probability distributions: Binomial, Poisson and Normal - evaluation of statistical parameters for these three distributions, Correlation and regression – Rank correlation, Correlation coefficient.
IV	**Applied Statistics:** Curve fitting by the method of least squares- fitting of straight lines, second degree parabolas and more general curves. Test of significance: Large sample test for single proportion, difference of proportions, single mean, difference of means, and difference of standard deviations.
V	**Small samples:** Test for single mean, difference of means and correlation coefficients, test for ratio of variances - Chi-square test for goodness of fit and independence of attributes, T- Test and ANOVA.

Text Book (s):

(1) Erwin Kreyszig, Advanced Engineering Mathematics, 9th Edition, John Wiley & Sons.
(2) P. G. Hoel, S. C. Port and C. J. Stone, Introduction to Probability Theory, Universal Book Stall.
(3) S. Ross, A First Course in Probability, 6th Ed., Pearson Education India.
(4) W. Feller, An Introduction to Probability Theory and its Applications, Vol. 1, 3rd Ed., Wiley.
(5) N.P. Bali and Manish Goyal, A text book of Engineering Mathematics, Laxmi Publications.
(6) B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers.
(7) Veerarajan T., Engineering Mathematics (for semester III), Tata McGraw-Hill, New Delhi.

DIGITAL ELECTRONICS
(EC301)

Objective: Students will demonstrate the ability to Understand working of logic families, logic gates, Combinational and Sequential logic circuits.	
Unit	**Topic**
I	**Fundamentals of Digital Systems and logic families:** Digital signals, digital circuits, AND, OR, NOT, NAND, NOR and Exclusive-OR operations, Boolean algebra, examples of IC gates, number systems-binary, signed binary, octal hexadecimal number, binary arithmetic, one's and two's complements arithmetic, codes, error detecting and correcting codes, characteristics of digital lCs, digital logic families, TTL, Schottky TTL and CMOS logic, interfacing CMOS and TTL, Tri-state logic.
II	**Combinational Digital Circuits**: Standard representation for logic functions, K-map representation, simplification of logic functions using K-map, minimization of logical functions. Don't care conditions, Multiplexer, DeMultiplexer/Decoders, Adders, Subtractors, BCD arithmetic, carry look ahead adder, serial adder, ALU, elementary ALU design, popular MSI chips, digital comparator, parity checker/generator, code converters, priority encoders, decoders/drivers for display devices, Q-M method of function realization.
III	**Sequential circuits and system:** A 1-bit memory, the circuit properties of Bistable latch, the clocked SR flip flop, J- K-T and D types flipflops, applications off lipflops, shift registers, applications of shift registers, serial to parallel converter, parallel to serial converter, ring counter, sequence generator, ripple (Asynchronous) counters, synchronous counters, counters design using flip flops, special counter IC's, asynchronous sequential counters, applications of counters.
IV	**A/D and D/A Converters:** Digital to analog converters: weighted resistor/converter, R-2R Ladder D/A converter, specifications for D/A converters, examples of D/A converter lCs, sample and hold circuit, analog to digital converters: quantization and encoding, parallel comparator A/D converter, successive approximation A/D converter, counting A/D converter, dual slope A/D converter, A/D converter using voltage of requencyandvoltagetotimeconversion,specificationsofA/Dconverters, example of A/D converter ICs
V	**Semiconductor memories and Programmable logic devices:** Memory organization and operation, expanding memory size, classification andcharacteristicsof memories, sequential memory, read only memory (ROM), read and write memory(RAM), content addressable memory (CAM), charge de coupled device memory (CCD), commonly used memory chips, ROM as a PLD, Programmable logic array, Programmable array logic, complex Programmable logic devices (CPLDS), Field Programmable Gate Array (FPGA).

Text Book (s):

1. R. P. Jain, "Modern Digital Electronics", McGraw Hill Education.
2. M. M. Mano, "Digital logic and Computer design", Pearson Education India.
3. A. Kumar, "Fundamentals of Digital Circuits", Prentice Hall India.
4. Floyd ," Electronic Devices" Pearson Education
5. Frenzel, "Communication Electronics: Principles and Applications", Tata Mc Graw Hill
6. Digital Electronics: An Introduction to Theory and Practice, William H. Gothmann, PHI Learning Private Limited

INDUSTRIAL SOCIOLOGY
(AS302)

Objective: The course attempts to analyze the structure and process of industrial organizations from the sociological perspective. The course enables students to have a general view of modern industry.	
Unit	**Topic**
I	Descriptors/Topics Industrial Sociology: Nature, Scope and Importance, Origin and Development, Industry as a social system, Evolution of Working Class , Changing nature of work , Growth of unorganized informal sector. Dynamics of Industrial Relations: Approaches to the study of Industrial Relations, Collective Bargaining – Concepts, Types, Scope and Importance.
II	Descriptors/Topics Industrial Disputes: Concept, Features and Kinds of disputes, Settling disputes, Mediation, Arbitration, Conciliation, Negotiation.
III	Descriptors /Topics Trade Union: Concept, Features, Functions and Types, History of Trade Union Movement in India Trade Unions and Challenges of Privatization and Globalization, Law and work, Decline of Trade Unions.
IV	Descriptors/Topics Dynamics of Industrial Relations: Corporate Social Responsibility, Inclusion of Women in the Corporate Sector, Scope of Industrial Sociology in India , Impact on Employment, Impact on HRD, impact on wages and benefits, Modern Industry in India – Development f Industry in Post-Independence period, The Indian Worker: Features of Indian worker, the contribution of social - Philosophy, family, caste and community in determining the attitude of workers .

Text Book (s):

1. PREMVIR KAPOOOR, Sociology & Economics for Engineers, Khanna Publishing House.
2. GISBERT PASCAL, Fundamentals of Industrial sociology, Tata McGraw Hill, New Delhi.
3. MAMORIA C.B. And MAMORIA S., Dynamics of Industrial Relations in India.
4. SINHA G.P. and P.R.N. SINHA, Industrial Relations and Labour Legislations, New Delhi, Oxford.
5. S.C. SHARMA, Industrial Safety and Health Management, Khanna Book Publishing Co. (P) Ltd.

OPERATING SYSTEM LAB
(DCS351)

LIST OF EXPERIMENTS

1. Implement CPU Scheduling Policies:
i. SJF ii. Priority iii. FCFS iv. Multi-level Queue

2. Implement file storage allocation technique:
i. Contiguous(using array)
ii. Linked –list(using linked-list)
iii. Indirect allocation (indexing)

3. Implementation of contiguous allocation techniques:
i. Worst-Fit ii. Best- Fit iii. First- Fit

4. Calculation of external and internal fragmentation
i. Free space list of blocks from system ii. List process file from the system

5. Implementation of compaction for the continually changing memory layout and calculate total movement of data

6. Implementation of resource allocation graph RAG)

7. Implementation of Banker's algorithm

8. Conversion of resource allocation graph (RAG) to wait for graph (WFG) for each type of method used for storing graph.

9. Implement the solution for Bounded Buffer (producer-consumer)problem using inter process communication techniques-Semaphores.

10. Implement the solutions for Readers-Writers problem using inter process communication technique –Semaphore.

Python Programming LAB
(CS352)

LIST OF EXPERIMENTS

1. Implement a sequential search
2. Create a calculator program
3. Explore string functions
4. Implement Selection Sort
5. Implement Stack
6. Read and write into a file
7. Demonstrate usage of basic regular expression
8. Demonstrate use of list
9. Demonstrate use of Dictionaries

DATA STRUCTURES LAB
(DCS353)

LIST OF EXPERIMENTS

1. To implement addition and multiplication of two 2D arrays.
2. To transpose a 2D array.
3. To implement stack using array.
4. To implement queue using array.
5. To implement circular queue using array.
6. To implement stack using linked list.
7. To implement queue using linked list.
8. To implement circular queue using linked list.
9. To implement binary tree using linked list.
10. To implement binary search tree using linked list.
11. To implement tree traversals using linked list.
12. To implement BFS using linked list.
13. To implement DFS using linked list.
14. To implement Linear Search.
15. To implement Binary Search.
16. To implement Bubble Sorting.
17. To implement Selection Sorting.
18. To implement Insertion Sorting.
19. To implement Merge Sorting.
20. To implement Heap Sorting.

DIGITAL ELECTRONICS LAB
(EC-351)

LIST OF EXPERIMENTS: -

1. Study of TTL gates – AND; OR; NOT; NAND; NOR; EX-OR; EX-NOR.
2. Design and realize a given function using K-maps and verify its performance.
3. Implementation and Verification of Decoder/De-Multiplexer and Encoder using Logic Gates.
4. Implementation of 4x1 multiplexer using Logic Gates.
5. To Design & Verify the Operation of Magnitude Comparator
6. To verify the truth tables of S-R; J-K; T and D type flip flops
7. Design, and Verify the 4- Bit Synchronous Counter
8. Design, and Verify the 4-Bit Asynchronous Counter.
9. To verify the operation of bi-directional shift register.
10. Implementation of 4-Bit Parallel Adder Using 7483 IC

COMPUTER NETWORKS
(DCS401)

Objective: The objective of this course is to provide basic exposure to computer networks theory and implementations.	
Unit	**Topic**
I	**Introduction:** Networks, Internet, Network Components, Network Categories, Applications of Computer Networks **Reference Models:** Concept of Layering, OSI Model, TCP/IP Protocol Suite, Functions of Layers **Physical Layer:** Transmission Mode, Physical Topology, Multiplexing, Transmission Media, Switching
II	**Data Link Layer:** Design Issues, Error Detection and Correction Techniques, Elementary Data Link Protocols, Sliding Window Protocols, Multiple Access Protocols, Ethernet, Connecting Devices
III	**Network Layer:** Logical addressing, IPv4 Addresses, NAT, IPv6 Addresses, Internet Protocol, IPv4, IPv6, Internetworking, Internet Control Protocols, Routing Algorithms, Distance Vector Routing, Link State Routing, Routing in the Internet
IV	**Transport Layer:** Process-to-Process Delivery, Transport Layer Protocols, UDP, User Datagram, TCP, TCP Segment, TCP Connection, Flow Control and Error Control, TCP Transmission Policy, Principles of Congestion Control, TCP Congestion Control, Quality of Service.
V	**Application Layer:** Principles of Network Applications, WWW and HTTP, Non-Persistent and Persistent Connections, Cookies, Web Caching, File Transfer, Remote Logging, Electronic Mail in the Internet, Domain Name System, Security: Introduction, Cryptography and Cryptanalysis, Public Key Cryptography Algorithms, RSA Algorithm, DES, Authentication and Authorization

References:

1. AS Tanenbaum, DJ Wetherall, Computer Networks, Prentice-Hall. .
2. LL Peterson, BS Davie, Computer Networks: A Systems Approach, Morgan-Kauffman.
3. W Stallings, Cryptography and Network Security, Principles and Practice, Prentice-Hall.
4. A.S. Tanenbaum, “Computer Networks, 3rd Edition”, PHI
5. W. Stallings, “Data and Computer Communication”, Macmillan Press
6. Comer, “Computer Networks & Internet”, PHI
7. Comer, “Internetworking with TCP/IP”, PHI
8. Forouzan, “Data Communication and Networking”, TMH

ARTIFICIAL INTELLIGENCE
(DCS402)

Objective: To learn the concepts of Artificial Intelligence and the methods of solving problems using Artificial Intelligence.	
Unit	**Topic**
I	**Introduction:** Definition, Historical Overview, Growth, Turing Test and Its Significance Branches of AI and Applications, Problem Solving, production system and Control Strategies.
II	**State Searching:** Informed and Uninformed (blind) Searches-DFS, BFS, Best First Search etc. AND-OR Graph, Algorithms A*, Properties of A*, AO* and Related Algorithms, Game Playing Strategies, Mini Max Procedure and Applications.
III	**Knowledge Representation & Reasoning:** Propositional logic, Theory of first order logic, Inference in First order logic, Forward & Backward chaining.
IV	**Introduction to Expert Systems:** System Feasibility Considerations, Architecture, Tools Overview of Rule Based and Other Types of ES Design. **Natural Language Processing -** Communication among agents, natural language processing, formal grammar, parsing, grammar
V	**Pattern Recognition:** Introduction, Design principles of pattern recognition system, Statistical Pattern recognition, Parameter estimation methods - Principal Component Analysis (PCA) and Linear Discriminant Analysis (LDA),

References:

1. Kevin Night and Elaine Rich, Nair B., "Artificial Intelligence (SIE)", McGraw Hill
2. Dan W. Patterson, "Introduction to AI and ES", Pearson Education.
3. Peter Jackson, "Introduction to Expert Systems", Pearson Education.
4. Elaine, Rich & K. Knight, Artificial Intelligence, TMH Publication
5. N.J. Nilson, Principles of Artificial Intelligence, Narosa Publication
6. Russell &Norvig, Artificial Intelligence: A modern Approach, Pearson Education.
7. E.Charniak& D. Mc Dermott, Introduction to AI, Addison Wesley
8. Avron Barr & Edward A, Feigenbaum the Handbook of Artificial Intelligence, Addision WesleyLongman
9. James Allen, Natural Language Understanding, Pearson.
10. Tau &Genzales, pattern Recognition Principles, Addison Wesley.

WEB TECHNOLOGY
(DCS403)

Objective: The objective of this course is to provide basic web technology concepts that are required for developing web applications.	
Unit	**Topic**
I	**Introduction to Web Technology:** Internet, WWW, Web Browsers with suitable examples, Web Servers with suitable examples, URL, HTTP, MIME. Introduction to HTML& DHTML**:** Basic Syntax, HTML Document Structure, Text Formatting, Images, Lists, Links, Tables, Frames, Forms. Cascade Style Sheets**:** Levels Of Style Sheets, Specification Formats, Style Classes, Properties, Colors, Span and Div tags.
II	**Introduction to Java Script:** Overview of java Script, Syntactic characteristics, Primitives, Operator and Expression, control statements, Arrays, functions, errors in scripts, Document Object Model(DOM),Event driven computation, element access in Java script, The navigator Object. Dynamic Document with Java Script : Element positioning, Moving elements, Changing colors and fonts, Dynamic content, Locating the mouse Cursor, Slow movements of elements, Dragging and Dropping Elements.
III	**Introduction to XML:** Syntax of XML, Document Structure, Document type definition, Namespaces, XML Schemas, Document Object model, Presenting XML, Using XML Processors: DOM and SAX.
IV	**Introduction to PHP:** Overview of PHP, general server characteristics, Creating PHP Pages, Form handling, Data Base access with PHP & MySql. JSP & Servlets: Basics of JSP, Tags, Session Handling, Redirection and Basics of Servlet
V	**Database Connectivity:** Connection to various databases (MySQL, Oracle). Database connectivity in PHP, JSP, Other server languages, Basic SQL Queries and Statements.

Text Book (s):

1. Programming world wide web- Robert W.Sebesta , Pearson.
2. Beginners PHP, Apache, MY Sql, Web Development, by Michael Glass, Wrox.
3. Head First PHP and MySql, Lynn Beighley & Michael Morrison, O'Reilly
4. Developing Web Applications, Ralph Moseley and M. T. Savaliya, Wiley-India.
5. Web Technologies, Black Book, Dreamtech Press.
6. HTML 5, Black Book, Dreamtech Press.
7. Web Design, Joel Sklar, Cengage Learning.
8. Developing Web Applications in PHP and AJAX, Harwani, McGraw Hill.
4.
9. Internet and World Wide Web How to program, P.J. Deitel & H.M. Deitel, Pearson.

DATABASE MANAGEMENT SYSTEM
(DCS302)

Objective: To familiarize the students with databases and techniques of retrieving and storing information.	
Unit	**Topic**
I	**Database system architecture:** Data Abstraction, Data Independence, Data Definition Language (DDL), Data Manipulation Language (DML). **Data models:** Entity-relationship model, network model, relational and object oriented data models, integrity constraints, data manipulation operations.
II	**Relational query languages:** Relational algebra, Tuple and domain relational calculus, SQL3, DDL and DML constructs, Open source and Commercial DBMS - MYSQL, ORACLE, DB2, SQL server. **Relational database design:** Domain and data dependency, Armstrong's axioms, Normal forms, Dependency preservation, Lossless design. **Query processing and optimization:** Evaluation of relational algebra expressions, Query equivalence, Join strategies, Query optimization algorithms.
III	**Storage strategies**: Indices, B-trees, hashing. **Transaction processing:** Concurrency control, ACID property, Serializability of scheduling, Locking and timestamp based schedulers, Multi-version and optimistic Concurrency Control schemes, Database recovery.
IV	**Database Security:** Authentication, Authorization and access control, DAC, MAC and RBAC models, Intrusion detection, SQL injection.
V	**Advanced topics:** Object oriented and object relational databases, Logical databases, Web databases, Distributed databases, Data warehousing and data mining.

Text Book (s):

1. "Database System Concepts", 6th Edition by Abraham Silberschatz, Henry F. Korth, S. Sudarshan, McGraw-Hill.
2. "Principles of Database and Knowledge – Base Systems", Vol 1 by J. D. Ullman, Computer Science Press.
3. "Fundamentals of Database Systems", 5th Edition by R. Elmasri and S. Navathe, Pearson Education
4. "Foundations of Databases", Reprint by Serge Abiteboul, Richard Hull, Victor Vianu, Addison-Wesley
5. Date C J, "An Introduction To Database System", Addision Wesley
6. Bipin C. Desai, "An introduction to Database Systems", Galgotia Publication Pvt. Ltd.
7. Majumdar & Bhattacharya, "Database Management System", TMH

DATA WAREHOUSE AND DATA MINING
(DCS405)

Objective: To introduce concepts and techniques of data warehousing.	
Unit	**Topic**
I	**Introduction to Data Warehouse:** A multidimensional Data Model – Data Warehouse architecture – Data preprocessing- Data cleaning – Data integration and Transformation.
II	**Introduction to Data Mining:** Data Mining Functionalities – Classification of Data Mining systems, Major issues in Data mining.
III	**Data Mining primitives:** Task – relevant data – kind of knowledge to be mined – Background knowledge –interestingness measures– presentation & visualization of discovered pattern - Data Mining Query language –Designing Graphical User interfaces based on DMQL - Architecture of Data mining.
IV	**Basic concepts:** market basket analysis - Mining single dimensional Boolean association rules from transactional databases. Classification & prediction: What's classification - issues regarding classification and prediction – Bayesian classification – prediction: linear – non linear.
V	**Cluster:** Types of Data in cluster analysis, Major clustering methods. Data mining applications.

Text Book (s):

1. Han J. & Kamber, M, "Data Mining: Concepts and Techniques", Morgan Kaufmann
2 Morgan Kaufmann, 2011. Immon.W.H., "Building the Data Warehouse", Wiley Dream
3. Anahory S., Murray, D, "Data Warehousing in the Real World", Pearson.
4. Berson, "Data Warehousing, Data-Mining & OLAP", TMH
5. Mallach, "Decision Support and Data Warehousing System", TMH
6. Bhavani Thuraisingham, "Data-Mining Technologies, Techniques Tools & Trends", CRC Press
7. Margaret H. Dunham, "Data-Mining, Introductory & Advance Topics", Pearson Education
8. Pieter Adrians, DolfZantinge, "Data-Mining", Pearson Education.

INDUSTRIAL MANAGEMENT
(AS401)

Objective: This course is to familiarize the prospective engineers with elementary principles of management. It also deals with acquainting the students with standard concepts and tools that they are likely to find useful in their profession when employed in the firm/industry/corporation.

Unit	Topic
I	Introduction: Concept, Development, application and scope of Industrial. Management. Productivity: Definition, measurement, productivity index, types of production system, Industrial Ownership. .
II	Management Function: Principle of Management – Time and motion study, work simplification – process charts and flow diagrams, Production Planning.
III	Inventory Control: Inventory, Cost, Deterministic Models, Introduction to supply chain management.
IV	Quality Control: Process control, SQC, Control charts, Single, Double and Sequential Sampling, Introduction to TQM.
V	Social Relations in Industry, Social Organization in Industry- Bureaucracy, Scientific Management and Human Relations, Early Industrialism – Types of Productive Systems – The Manorial or Feudal system. The Guild system, The domestic or putting-out system,and the Factory system. Characteristics of the factory system. Causes and Consequences of industrialization. Obstacles to and Limitations of Industrialization.

Text Book (s):

1. Mamoria C.B. and Mamoria S., Dynamics of Industrial Relations in India.
2. Sinha G.P. and P.R.N. Sinha, Industrial Relations and Labour Legislations.
3. Nadkarni, Lakshmi, Sociology of Industrial Worker, Rawat.
4. Bhowmick Sharit, Industry, Labour and Society, Orient.

COMPUTER NETWORKS LAB
(DCS451)

LIST OF EXPERIMENTS

1. To learn basics of the packet tracer simulator tool.
2. Write a program in C to implement bit stuffing and character stuffing.
3. To connect the computers in Local Area Network and to detect collision of packets.
4. To configure DHCP and DNS server for a given network in packet tracer simulator tool.
5. Write a C program to get the MAC or Physical address of the system using ARP (Address Resolution Protocol) and to subnet a given network according to the requirements in packet tracer simulator tool. .
6. To configure router using command line. Also observe the datagram formats in packet tracer simulator tool.
7. To configure NAT for a given network in packet tracer simulator tool.
8. Write a program to implement TCP & UDP Sockets.
9. Write a C program to transmit a character, a string and a file from one computer to another using RS-232 cable and to configure static routing in packet tracer simulator tool.
10. To configure dynamic routing protocols in packet tracer simulator tool.

ARTIFICIAL INTELLIGENCE LAB
(DCS452)

LIST OF EXPERIMENTS

1. WAP in Prolog to have an introduction of Prolog fundamentals: constants, predicates, arguments, variables.
2. WAP in Prolog to have an introduction of Tests, Backtracking.
3. WAP in Prolog to have an introduction of Recursion.
4. WAP in Prolog to have an introduction of State-Space Search: DFS
5. WAP in Prolog to have an introduction of State-Space Search: BFS
6. Write a program to implement supervised learning on IRIS Dataset using Bayes classifier.

7-8. Write a program to implement Genetic Algorithm to find out the optimal solution of different equation.

9. Write a program to implement Nearest Neighbour classification technique.
10. Write a program to implement k-means clustering on IRIS Dataset.

WEB TECHNOLOGY LAB
(DCS453)

LIST OF EXPERIMENTS

1. Write a program in HTML to display different styles of heading text.
2. Write a program to display the processes to be followed for a patient when he enters for a complete check-up. Use ordered lists and unordered lists.
3. Write a program to display a traditional Newspaper with the use of table tags.
4. With the help of "IMAGE" tags write a program to display the image along with some contents.
5. Use "Anchor" tag to write a program for displaying various Menus.
6. Use mapping technique, to map a particular part of image and move the control corresponding to that area. For e.g., in an image, if there are bat, ball, stump etc. When you click stump control should move to a file call St.htm.
7. Create frames that have details about various cities.
8. Create a form to display the kinds of food available in a Restaurant. (Use checkboxes wherever necessary)
9. Write a program to "reload" a page automatically once in 5 seconds.
10. Write a program using CSS to set the background colour, font, and paragraph.

DATABASE MANAGEMENT SYSTEM LAB
(DCS352)

LIST OF EXPERIMENTS

1. Write the queries for Data Definition and Data Manipulation Language.
2. Write SQL queries using logical operators.
3. Write SQL queries using SQL operators
4. Write SQL query using character, number, date and group functions
5. Write SQL queries for relational algebra
6. Write SQL queries for extracting data from more than one table
7. Write SQL queries for sub queries, nested queries
8. Write program of PL/SQL
9. Concepts for ROLL BACK, COMMIT & CHECK POINTS
10. Create VIEWS, CURSORS and TRGGERS.