

CURRICULUM

For

DIPLOMA COURSE IN COMPUTER SCIENCE & ENGINEERING

[Proposed from 2018-19]



IIMT UNIVERSITY
MEERUT

IIMT University, Meerut

**SECOND YEAR, SEMESTER-III
STUDY & EVALUATION SCHEME**

S. No.	Course Code	Course Name	Periods			Credit	Evaluation Scheme		
			L	T	P		External	Internal	Total
1	DCS-310	Applied mathematics-II	3	1	-	3	50	20	70
2	DCS-320	Operating system	3	1	-	3	50	20	70
3	DCS-330	Internet and web technology	3	1	-	3	50	20	70
4	DCS-340	Introduction to office tools	3	1	-	3	50	20	70
5	DCS-350	Digital Electronics & Measuring Instrument	3	1	-	3	50	20	70
6	DCS-360	Functional Communication	3	1	-	3	50	20	70
7	DCS-320P	Operating system lab	-	-	2	2	30	20	50
8	DCS-340P	Introduction to office tools lab	-	-	2	2	30	20	50
9	DCS-350P	Digital Electronics & Measuring Instrument Lab	-	-	2	2	30	20	50
10	ECC-321	Industrial Visit/ Seminar/ Presentation on the report of visits						25	25
11	ECC-322	University Social Responsibility						25	25
12	ECC-323	Spoken Tutorial Certification			2	2		25	25
13	ECC-324	MOOCS/ SWAYAM			2	2		25	25
		Total	18	6	10	28	390	280	670

**SECOND YEAR, SEMESTER-IV
STUDY & EVALUATION SCHEME**

S. No.	Course Code	Course Name	Periods			Credit	Evaluation Scheme		
			L	T	P		External	Internal	Total
1	DCS-410	Computer Network	3	1	-	3	50	20	70
2	DCS-420	Data Structures Using C	3	1	-	3	50	20	70
3	DCS-430	Management Information System	3	1	-	3	50	20	70
4	DCS-440	Microprocessor & Its Applications	3	1	-	3	50	20	70
5	DCS-450	Computer Hardware And Maintenance	3	1	-	3	50	20	70
6	DCS-460	Technical Communication	3	1	-	3	50	20	70
7	DCS-420P	Data Structures Using C Lab	-	-	2	2	30	20	50
8	DCS-440P	Microprocessor Lab	-	-	2	2	30	20	50
9	DCS-450P	Computer Hardware And Maintenance Lab	-	-	2	2	30	20	50
10	ECC-421	Industrial Visit/ Seminar/ Presentation on The Report Of Visits						25	25
11	ECC-422	University Social Responsibility						25	25
12	ECC-423	Spoken Tutorial Certification			2	2		25	25
13	ECC-424	MOOCS/ SWAYAM			2	2		25	25
		Total	18	6	10	28	390	280	670

SEMESTER-III

[L= Lecture, T = Tutorials, P = Practicals& C = Credits]

DCS-310	APPLIED MATHEMATICS-II	3L:1T:0P	3 credits
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UNIT 1. MATRICES:**(L-8)**

- 1.1 Algebra of Matrices, Inverse: Addition, Multiplication of matrices, Null matrix and a unit matrix, Square matrix, Symmetric, Skew symmetric, Hermitian, Skew hermition, Orthogonal, Unitary, diagonal and Triangular matrix, Determinant of a matrix. Definition and Computation of inverse of a matrix.
- 1.2 Elementary Row/Column Transformation: Meaning and use in computing inverse and rank of a matrix.
- 1.3 Linear dependence, Rank of a Matrix: Linear dependence/independence of vectors, Definition and computation of a rank of matrix. Computing rank through determinants, Elementary row transformation and through the concept of a set of independent vectors, Consistency of equations.
- 1.4 Eigen Pairs, Cayley-Hamilton Theorem: Definition and evaluation of Eigen values and Eigen vectors of a matrix of order two and three, Cayley-Hamilton theorem (without proof) and its verification, use in finding inverse and powers of a Matrix.
- 1.5 Simple Applications: LCR circuit, Motion under gravity, Newton's law of cooling, radioactive decay, Population growth, Force vibration of a mass point attached to spring with and without damping effect. Equivalence of electrical and mechanical system

UNIT II. DIFFERENTIAL CALCULUS:**(L-8)**

- 2.1 Function of two variables, identification of surfaces in space, conicoids
- 2.2 **Partial Differentiation:** Directional derivative, Gradient, Use of gradient f , Partial derivatives, Chain rule, higher order derivatives, Euler's theorem for homogeneous functions, Jacobians.
- 2.3 **Vector Calculus:** Vector function, Introduction to double and triple integral, differentiation and integration of vector functions, gradient, divergence and curl, differential derivatives.

UNIT III. DIFFERENTIAL EQUATION:**(L-8)****3.1 Formation, Order, Degree, Types, Solution:**

Formation of differential equations through physical, geometrical, mechanical and electrical considerations, Order, Degree of a differential equation, Linear, Nonlinear equation.

3.2 First Order Equations :

Variable separable, equations reducible to separable forms, Homogeneous equations, equations reducible to homogeneous forms, Linear and Bernoulli form exact equation and their solutions.

3.3 Higher Order Linear Equation :

Property of solution, Linear differential equation with constant coefficients

3.4 Simple Applications :

LCR circuit, Motion under gravity, Newton's law of cooling, radioactive decay, Population growth, Force vibration of a mass point attached to spring with and without damping effect. Equivalence of electrical and mechanical system

UNIT IV. INTEGRAL CALCULUS-II**(L-8)**

4.1 Beta and Gamma Functions: Definition, Use, Relation between the two, their use in evaluating integrals.

4.2 Laplace Transform: Definition, Basic theorem and properties, Unit step and Periodic functions, inverse Laplace transform, Solution of ordinary differential equations.

UNIT V. PROBABILITY AND STATISTICS:**(L-8)**

5.1 Probability: Introduction, Addition and Multiplication theorem and simple problem.

5.2 Distribution: Discrete and continuous distribution, Binomial Distribution, Poisson Distribution, Normal Distribution.

Course Outcome:

After completing the course, students should be able to:

1. To apply the basic results of Linear Algebra and Geometry, being able to use matrix language to describe basic concepts.
2. To develop and to experiment problem-solving strategies, and to distinguish the most appropriate method in each situation
3. Explain the fundamental concepts of partial differential equations and their role in modern mathematics and applied contexts.
4. To solve the nth order Differential equations of any order
5. Compute a given integral using the most efficient method
6. To Find the transform of a periodic function.
7. to translate real-world problems into probability models
8. To Solve basic integrodifferential equation using the Laplace transform.

Text Books:

1. Prakash Yeri, "Applied Mathematics 2", Eastern Book Promoters Belgaum
2. W. R. Neelakanta, "Applied Mathematics II", Sapna Book House

DCS-320	OPERATING SYSTEM	3L:1T:0P	3 credits
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UNIT I**(L-8)**

Introduction: Operating system, Main Frame, Desktop and Multiprocessor, Distributor system, Real time systems, operating system services and components.

UNIT II**(L-8)**

Process Management and CPU scheduling :Process Concept, Process synchronization Process Scheduling, Concept of Threads & Multithreading,

CPU Scheduler, Preemptive scheduling dispatcher, Scheduling Criteria, Scheduling Algos: FCFS, SJF, Priority, Round Robin

UNIT-III**(L-8)****8)**

Deadlock: Deadlock and Starvation, necessary conditions for deadlock, Resource allocation graph, Deadlock prevention, Deadlock avoidance – Banker’s Algorithm, Deadlock detection wait for graph and detection algorithm, Deadlock recovery.

UNIT IV**(L-8)**

Memory Management: Main memory, contiguous memory allocation, segmentation, paging, virtual memory, demand paging, page replacement algorithms, allocation.

UNIT V**(L-8)**

File system: File concept, file attributes, file operations, file types, file access: Sequential and direct, allocation methods-Contiguous allocation, linked allocation, indexed allocation.

Course Outcome :

After completing the course, students should be able to:

1. To implement various algorithms required for management, scheduling, allocation and communication used in operating system
2. Have knowledge of different types of operating systems along with concept of file systems and CPU scheduling algorithms used in operating system.
3. To have knowledge of memory management and deadlock handling algorithms.
4. To implement various algorithms required for management, scheduling, allocation and communication used in operating system

Text Books

1. Silbershatz, A. and Galvin, P., *Operating System Concept*, Addison-Wesley.
2. Nutt, G., *Operating Systems*, Addison-Wesley.
3. God bole, A., *Operating System*, Prentice Hall of India.

References Books

1. Flynn, M., *Understanding Operating System*, Thomson Press.
2. Tannenbaum, O., *Operating System Concept*, Addison-Wesley.

DCS-330	INTERNET AND WEB TECHNOLOGY	3L:1T:0P	3 credits
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UNIT-I**(L-8)**

Internet Basics: Specification on technical details for establishing Internet, Types and functions of modems, IP addressing, Internet Domain, Domain Name System, TCP/IP Protocols, Internet Service Providers, Intranets, E-mail, Telnet, FTP, Video conferencing, E- commerce Internet Connectivity: Telephone line, Cable, Leased line, ISDN.

UNIT-II**(L-8)**

World Wide Web: World Wide Web and its evolution, Web page, Web server, HTTP Protocol, Navigation Tools: Mozilla Firefox, Google Chrome, Internet Explorer , Uniform Resource Locator (URL) , Hypertext, Hyperlinks and Hypermedia Search Engines , Proxy Servers.

UNIT-III**(L-8)**

Developing Portals using HTML: Introduction to HTML , Basic structure of HTML, designing a Webpage, Inserting links images, horizontal rules comments, Formatting Text, Title, Heading, Colors, Fonts, Sizes , Simple table and forms, HTML tags , Hyperlinks , Adding graphics and images , image maps , image file , using tables , Forms , Style sheets and frame.

UNIT-IV**(L-8)**

Java Scripts and Java Servlet : Introduction to Java Scripts , adding Java Scripts to documents, embedding Java Scripts , linking Java Scripts , creating a page program with Scripts. Servlet environment and role, HTML support, Servlet API , Servlet life cycle , Cookies and Sessions.

UNIT-V**(L-8)**

Security Threats From Mobile Codes, Types Of Viruses, Client Server Security Threats Data & Message Security, Various electronic payment systems, Introduction to EDI, Challenges–Response System, Encrypted Documents And Emails , Firewalls: Hardened Firewall Hosts, Ip- Packet Screening, Proxy Application Gateways, Aaa (Authentication ,Authorization And Accounting).

Course Outcome :

After completing the course, students should be able to:

1. Students are able to develop a webpage by the use of java script and HTML
2. To understand the establishment concept of internet
3. To analyze the elements of a web page.
4. To aware about the various security threats on internet.
5. To develop a dynamic webpage by the use of java script

Text Books

1. Internet & Intranet Engineering,- Daniel Minoli, TMH.
2. Alexis Leon and Mathews Leon – Internet for Every One, Tech World.

Reference Books

1. Eric Ladd, Jim O'Donnel –“Using HTML 4, XML and JAVA”-Prentice Hall of India – 1999.
2. “Beginning Java Script “– Paul Wilton – SPD Publications –2001.

DCS-340	INTRODUCTION TO OFFICE TOOLS	3L:1T:0P	3 credits
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UNIT-I **(L-8)**

MS-WORD

Create a new document, Open, save and print a document, Edit and format text, Change the page layout, background and borders, Insert headers and footers, Insert and edit tables, Insert clip art and pictures to documents, Perform a mail merge, Share and review shared document files.

UNIT-II **(L-8)**

MS-EXCEL

Create, open and view a workbook, Save and print workbooks, Enter and edit data, Modify a worksheet and workbook, Work with cell references, Learn to use functions and formulas, Create and edit charts and graphics, Filter and sort table data, Work with pivot tables and charts, Import and export data.

UNIT-III **(L-8)**

MS-ACCESS

Examine database concepts and explore the Microsoft Office Access environment, Design a simple database, Build a new database with related tables, Manage the data in a table, Query a database using different methods, Design a form, Generate a report, Import and export data

UNIT-IV **(L-8)**

MS –POWER POINT

Create a new presentation, Modify presentation themes, Add and edit text to slides, Add new slides to a presentation, Insert clipart images and shapes to slides, Insert and modify tables and charts, Add sound and video to a slide presentation, Insert and edit animations and slide transitions, Display a speaker-lead and self-running presentation.

UNIT-V **(L-8)**

Electronic Mail Using Outlook Express

Composing an Email Message, Working with Address Book, Automatically Add contents to Your Address Book, Reading Email using Outlook Express, Reading a message, Checking for New Messages, Reading file Attachment, Taking Acting on a Messages, Web Based Email, Advantageous using Web Based Email. Operators; Error handling during file operations; Formatted I/O.

Course Outcome :

After completing the course, students should be able to:

1. Recognize when to use each of the Microsoft Office programs to create professional and academic documents.

2. Use Microsoft Office programs to create personal, academic and business documents following current professional and/or industry standards.
3. to perform accounting operations
4. to perform presentation skills
5. to compose email with attachment and send

Text Books

1. Rambaugh Sinha P.K., Computer Fundamentals, BPB Publishing.
2. Bill Bruck., The Essentials Office 2000 Book, BPB Publishing.
3. Leon A. & Leon M., Introductions to Computers, Vikas Publications.

Reference Books:

1. Peter Norton_s, Introductions to Computers, Tata McGraw Hill.
2. Price Michael, Office in Easy Steps, TMH Publication.

DCS-350	DIGITAL ELECTRONICS & MEASURING INSTRUMENTS	3L:1T:0P	3 credits
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Unit-I: (L-8)

1. INTRODUCTION TO DIGITAL ELECTRONICS

- 1.1 Basic difference between analog and digital Signal.
- 1.2 Application and advantages of digital signal processing.

2. NUMBER SYSTEM

- 2.1 Binary, Octal and Hexadecimal number system; conversion from decimal octal and hexadecimal to binary and vice-versa.
- 2.2 Binary addition, subtraction, multiplication and division including binary numbers
- 2.3 1's and 2's complements method subtraction.

3. CODES AND CODE CONVERSION

- 3.1 The 8421 and excess-3 codes; mention of other popular BCD Codes
- 3.2 Addition of 8421, BCD coded numbers its limitations and Excess-3 coded numbers.

Unit-II: (L-8)

1. LOGIC GATES

- 1.1 Definition, symbols and truth tables of NOT, AND, OR, NAND, NOR, EXOR Gates.
- 1.2 Concept of negative and positive logic. Use of NAND and NOR Gate as universal gate.
- 1.3 Overview of Half Adder/Subtractor and Full Adder/ Subtractor (Block Diagram Only)

2. LOGIC FAMILIES AND DIGITAL ICs

- 2.1 Logic family classification
- 2.2 Concept of Bipolar Logic, Diode Logic, Transistor Inverter, TTL logic, MOS, CMOS logic, ECL Logic

Unit-III: (L-8)

1. ENCODER, DECODERS & DISPLAY DEVICES ASSOCIATED CIRCUITS;

- 6.1 LED, LCD, seven segment display. Basic operation of various commonly used types.
- 6.2 Decoder circuits -for 7 segment display.
- 6.3 Basic decimal to BCD encoder circuits.
- 6.4 Basic Multiplexer and De multiplexer

2. FLIP FLOPS AND COUNTERS :

- 2.1. Brief idea of Flip-Flops and their operations. RS, T, D, JK, Master/Slave JK Flip Flop mention commonly used ICs Flip flops.
- 2.2 Counters and counters classification.
- 2.3 Familiarization with commercial TTL/CMOS counters ICs.

Unit-IV: (L-8)**1. SHIFT REGISTERS;**

1.1 Introduction and Basic concepts including shift left and shift right.

1.2 Serial In Serial Out, Serial In Parallel Out, Parallel In Serial Out, Parallel In Parallel Out

1.3 Universal shift register.

2. MEMORIES

9.1 Classification according to the following heads.

(a) Volatile and non-volatile memories.

(b) Random access memories and sequential access.

(c) Semiconductor and non-semiconductor memories.

(d) Destructive and non-destructive memories.

9.2 Semi-conductor ROMs, PROMs, EPROM, FLASH, SRAM. DRAM, structure and working of CCD.R/W memory.

Unit-V: (L-8)**1. A/D AND D/A CONVERTERS:**

10.1 Use of A/D and D/A converters.

2. BASIC MEASURING INSTRUMENTS

11.1 Multimeters – Analog & Digital – Basic principles of measurement & specifications

11.2 Cathode Rays Oscilloscope – Block diagram & basic working, specification, Different uses of CRO, Different types of CRO – dual trace, storage (Brief introduction).

Course Outcome:

After studying this course the students would gain enough knowledge

1. Have a thorough understanding of the fundamental concepts and techniques used in digital electronics.
2. To understand and examine the structure of various number systems and its application in digital design.
3. The ability to understand, analyze and design various combinational and sequential circuits.
4. Ability to identify basic requirements for a design application and propose a cost-effective solution.
5. The ability to identify and prevent various hazards and timing problems in a digital design.
6. To develop skill to build, and troubleshoot digital circuits.
7. To understand and examine the working of CRO and Multimeters.

Text Books:

1. Malvino & Leach "Digital Principles and Applications", Tata McGraw Hill, Delhi.
2. M. Morris Mano, "Digital Design", Pearson, Delhi.

Reference Books:

1. Taub & Schilling "Digital Electronics", Tata McGraw Hill, Delhi.
2. A. K. Shaney. "Measurement & Measuring Instruments", Dhanpat Rai, Delhi.
3. Jain R.P. "Modern Digital Electronics", Tata McGraw Hill Delhi.

DCS-360	FUNCTIONAL COMMUNICATION	3L:1T:0P	3 credits
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UNIT I (L-8)

Functional Grammar: Active, Passive voice, Conditional Sentences, Syntax, Concord, and Common Errors.

UNIT II (L-8)

Communication: Meaning & Importance of Communication, Process of communication, Language as a tool of Communication.

UNIT III (L-8)

Writing Skills: Reporting events, Writing news paper reports, Bio-data making, Writing of C.V and Resumes, Writing job application.

UNIT IV (L-8)

Listening Skills: The listening process, hearing & listening, types of listening, Barriers to listening.

UNIT V (L-8)

Introduction to New Age Media. Internet, websites, social media (pros and cons), emails, blogs.

Course Outcome :

After completing the course, students should be able to:

1. To use correctly and spontaneously, model, define vocabulary, expressions, clichés applied for specific purposes.
2. Improve public speaking skills, verbal ability, self-confidence, and audience adaptation.
3. Understand and develop media literacy

Text books:

1. Les Sternberg , “Functional Communication: Analyzing the Nonlinguistic Skills of Individuals with ...”. Springer-Verlag, Newyork
2. David P. Wacker and Joe Reichle , “Functional Communication Training for Problem Behavior”, Guilford Press London”,

DCS-320P	OPERATING SYSTEM LAB	0L:0T:2P	2 credits
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Note : Minimum eight practical's have to be performed

1. Write a program to simulate producer-consumer problem using semaphores.
2. Write a program to implement an Algorithm for Dead Lock Detection
3. Write a program for FCFS process scheduling.
4. Write a program for SJF process scheduling
5. Write a program for RR process scheduling
6. Write a program for priority process scheduling
7. Write a program to implement of banker's algorithm
8. Write a program to implement FIFO page replacement algorithm.
9. Write a program to implement LRU page replacement algorithm.
10. Write a program to implement FCFS page replacement algorithm.

Laboratory Outcome

At the end of this lab session, the student will

1. To make students able to implement CPU scheduling algorithms and Bankers algorithm used for deadlock avoidance and prevention.
2. Students will also be able to implement page replacement and memory management algorithms.
3. To simulate CPU Scheduling Algorithms like FCFS, Round Robin, SJF, and Priority.
4. .4. To Implement memory management schemes and page replacement schemes

DCS-340P	INTRODUCTION TO OFFICE TOOLS LAB	0L:0T:2P	2 credits
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Note : Minimum eight experiments have to be performed

1. Creation and editing of Text files using MS- word.
2. Create a document using styles and formatting option
3. Create a document using different fonts.
4. Create a document using the function page setup and page preview, and then print that document.
5. Creation and operating of spreadsheet using MS-Excel
6. Create a table and perform operation in it.
7. Create a table, chart in excel and implement all formula as addition, subtraction, multiplication and division.
8. How to use mail merge in MS Word.
9. Creation and editing power-point slides using MS- power point.
10. Creation and manipulation of database table in MS-Access

Laboratory Outcome:

At the end of this lab session, the student will

1. Recognize when to use each of the Microsoft Office programs to create professional and academic documents.
2. Use Microsoft Office programs to create personal, academic and business documents following current professional and/or industry standards.
3. Apply skills and concepts for basic use of computer hardware, software, networks, and the Internet in the workplace

DCS-350P	DIGITAL ELECTRONICS & MEASURING INSTRUMENT LAB	0L:0T:2P	2 credits
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- 1 Introduction to Digital Electronics Lab- Nomenclature of ICS's, Specifications.
- 2 Study of Breadboard, Datasheets, VCC and ground.
- 3 Verification of truth tables of logic gates.
- 4 Implementation of given Boolean function using logic gates.
- 5 To study and verify NAND & NOR as universal gates.
- 5 Verification of state tables of RS-JK, T and D flip flops using NAND and NOR gates.
- 6 Implementation and verification of Adder (Half and Full) and subtraction using Logic gates.
- 7 Design and verify the out of a 2:4 Decoder.
- 9 Design and verify the out of a 4:1 Multiplexer & 1:4 De-multiplexer.
- 10 Measurement of voltage, Frequency of a signal using CRO.
11. Different applications of a multimeter

Laboratory Outcome:

At the end of this lab session, the student will

1. Students will demonstrate proficiency in digital circuit's analysis and design methods by designing, implementing, and testing project-based digital circuits.
2. Students will be able to correctly analyze a circuit and compare its theoretical performance to actual performance.
3. Students will be able to correctly operate standard electronic test equipment such as oscilloscopes, digital multi-meters and implement digital circuits.

SEMESTER-IV

DCS-410	COMPUTER NETWORK	3L:1T:0P	3 credits
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UNIT-1**(L-8)****Overview of data communication and Networking:**

Networks Basics- Definition, Networking models- Peer-to-peer Network, Server Client Network, LAN, MAN and WAN, Network Services, Topologies, OSI Reference Model, TCP/IP reference Model, Switching Methods, direction of data flow(simplex ,half duplex, full duplex); categories of network (LAN, MAN,WAN);Internet: brief history, internet today; Protocols and standards. Transmission Media, switching methods, ISDN.

UNIT-2**(L-8)****Data Link and Medium Access Sub Layer**

Types of errors, framing(character and bit stuffing), error detection & correction methods; Flow control; Protocols: Stop & wait ARQ, Go-Back- N ARQ, Selective repeat ARQ, HDLC; Point to point protocol, LCP, NCP, FDDI, token bus, token ring; Reservation, polling, concentration; Multiple access protocols: Pure ALOHA, Slotted ALOHA, CSMA, CSMA/CD, FDMA, TDMA, CDMA; Traditional Ethernet, fast Ethernet;

UNIT-3**(L-8)****Network Layer**

Internetworking & devices: Repeaters, Hubs, Bridges, Switches, Router, Gateway; Addressing : Internet address, classful address, subnetting; Routing : techniques, static vs. dynamic routing , routing table for classful address; Routing algorithms: shortest path algorithm, flooding, distance vector routing, link state routing; Protocols: ARP,RARP, IP, ICMP, IPV6; Unicast and multicast routing protocols.

UNIT-4**(L-8)****Transport layer:**

Process to process delivery; UDP; TCP; Congestion control algorithm: Leaky bucket algorithm, Token bucket algorithm, choke packets; Quality of service: techniques to improve Qos.

UNIT-5**(L-8)**

Application layer and Emerging Technologies in Networking File Transfer, Access and Management, Electronic mail, Virtual Terminals, Firewalls, Introduction to Blue-Tooth, ISDN services, Cellular Telephony and satellite network.

Course Outcome :

After completing the course, students should be able to:

1. Describe the basis and structure of an abstract layered protocol model
2. Describe, analyse and compare a number of datalink, network, and transport layer protocols
3. Design and implement datalink or network layer protocols within a simulated networking environment
4. Describe routing and congestion in network layer with
5. Routing algorithms and classify ipv4 addressing scheme

Text Books

1. Forouzan, B.A., *Data Communication and Networking*, Tata McGraw Hill.
2. Achyut, S. G., *Data Communications & Networks*, Tata McGraw Hill.
3. Forouzan, B.A., *TCP/IP Protocol Suit*, Tata McGraw Hill.

Reference Books

1. Stallings, W., *Data and Computer Communication*, Macmillan Press.
2. Keshav, S., *An Engineering Approach on Computer Networking*, Addison-Wesley.
3. Larry, L.P. and Peter, S.D., *Computer Network*, Harcourt Asia.

DCS-420	DATA STRUCTURE USING 'C'	3L:1T:0P	3 credits
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UNIT-I**(L-8)**

Introduction: Basic Terminology, Elementary Data Organization, Algorithm, Efficiency of an Algorithm, Time and Space Complexity, Asymptotic notations: Big-Oh, Time-Space trade-off. Abstract Data Types (ADT).

Arrays: Concept of Arrays, Single dimensional array, Two dimensional array storage strategy of multidimensional arrays, Operations on arrays with Algorithms (searching, traversing, inserting, deleting).

UNIT-II**(L-8)**

Linked Lists: Introduction to linked list and double linked list, Representation of linked lists in Memory, Traversing a linked list, Searching linked list, Insertion and deletion into linked list, Application of linked lists.

UNIT-III**(L-8)**

Sorting and Searching: Introduction, Search algorithm (Linear and Binary), Concept of sorting, Sorting algorithms (Bubble Sort, Insertion Sort, Quick Sort, Selection Sort, Merge Sort, Heap Sort) and their comparisons.

UNIT-IV**(L-8)**

Stacks and Queues : Introduction to stacks, Representation of stacks, Implementation of stacks, Uses of stacks, Introduction to queues, Implementation of queues (with algorithm), Circular Queues, De-queues.

UNIT-V**(L-8)**

Trees and Graphs: Concept of Trees, Concept of representation of Binary tree, Binary search trees Traversing, Binary Trees (Pre order, Post order and In order), Searching, inserting and deleting binary search trees, depth-First-Search

Course Outcome :

After completing the course, students should be able to:

1. To access how the choices of data structure & algorithm methods impact the performance of program.
2. To Solve problems based upon different data structure
3. Ability to summarize searching and sorting techniques
4. Ability to have knowledge of tree and graphs concepts.

Text Books

1. Lipschutz, S., *Data Structure*, Tata McGraw Hill.
2. Tenenbaum, A.M., *Data Structures using C & C++*, Prentice Hall of India.
3. Kanitkar, Y., *Data Structure using C++*, BPB.

Reference Books

1. Sahani, S. and Horowitz, E., *Fundamentals of Data Structures*, Galgotia
2. Kruse, R., *Data Structures and Program Design in C*, Pearson Education.
3. Cormen, T. H., *Introduction to Algorithms*, Prentice Hall of India.
4. Loudon, K., *Mastering Algorithms With C*, Shroff Publisher & Distributors.

DCS-430	MANAGEMENT INFORMATION SYSTEM	3L:0T:0P	3 credits
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UNIT I (L-8)

Introduction to Information system, types of Information system, components of IS, MIS, importance and need of MIS, network and internet, Information System design, IT infrastructure library, decision support system.

UNIT II (L-8)

Structure of MIS, MIS vs. Data Processing, knowledge requirement of MIS, information flow in MIS, MIS and information resource management, service management, availability management.

UNIT III (L-8)

Enterprise Resource Planning (ERP)- ERP (Basic features, Benefits ,selection, implementation) Enterprise Management System (EMS) & Management Information System (MIS) Customer Relationship Management (CRM) (Concept , Three Phases of CRM, Benefits , Challenges & Trends)

UNIT IV (L-8)

Decision Support System (Concept, Components, Development, Risk) Management Information System and Decision Support System, Concept of Artificial Intelligence & Expert System. Data warehouse (Concept, Design, Organization and Management, Architecture, Implementation), Data in data warehouse ,Data Mining

UNIT V (L-8)

Introduction to Cyber Ethics, intellectual property, cyber crimes challenges, electronic commerce, Electronic Data Interchange, Smart Card, Artificial Intelligence, and Expert Systems.

Course Outcome :

After completing the course, students should be able to:

1. To aware of various Information System solutions like ERP, CRM, Data warehouses
2. To take out the help of AI in Decision making
3. To aware about the Cyber Ethics
4. To understand the usage of Information Systems in management.

Text Books:

1. *Management Infomation Systems* by O'Brien, J.A. 7th ed. New Delhi : Tata McGraw-Hill Publishing Company Limited, c2006
2. *Management Information Systems* by Jaiswal, M. New Delhi : Oxford University Press, c2004
3. GoelRitendra, *Computer Application in Management*, New Age International Publishers, New Delhi.
4. Chowdhury G.G., *Text Retrieval Systems in information Management*, New Age International Publishers, New Delhi.

Reference Book:

1. Bhunia C.T., *Information Technology Network and Internet* by, New AgeInternational Publishers, New Delhi.

DCS-440	MICROPROCESSOR& ITS APPLICATIONS	3L:1T:0P	3 credits
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UNIT I **(L-8)**

Logic Gates: Logic gates, Boolean algebra and the 'Demourgon's Theorems

Microprocessor: Evolution of Microprocessor, Microcomputer system, Architecture of aMicroprocessor (With reference to 8085 microprocessor) Bus, bus organization of 8085, Block diagram of 8085 and function of each block, Pin details of 8085.

UNIT II **(L-8)**

Memory: Basic concept and hierarchy, Memories and I/O interfacing, Concept of memorymapping, partitioning of total memory space. N* M bit RAM, Expansion of word length and capacity, static and dynamic RAM.

Cache memory: concept and design issues, address mapping and page replacement.

Auxiliary memories:-Magnetic disk, magnetic tape and optical disks, Virtual memory: concept and Implementation.

UNIT III **(L-8)**

Central Processing Unit: Addition and subtraction of signed numbers, Signed operandsmultiplication, Booth's algorithm, Division algorithm. Floating point arithmetic operations, general registers organization, stack organization and addressing modes.

Programming: Programming (with respect to 8085 microprocessor), Brief idea of machine and assembly languages, Machines and Mnemonic codes.

UNIT IV **(L-8)**

Control Unit: Instruction types, Edge triggered And Level triggered, Instructions formats,instruction cycles and sub cycles (fetch and execute etc), execution of a complete instruction. Explanation of the instructions groups: Data transfer groups. Arithmetic Group, Logic Group, microprogramming sequencing: micro-instruction with next address field, pre-fetching microinstructions.

UNIT V **(L-8)**

Input / Output: Peripheral devices (8255 PPI, 8257 DMA controller), I/O interface, I/O ports, Interrupts: types of interrupts .Modes of Data Transfer: Programmed I/O, Direct Memory Access, Serial Communication: Synchronous-asynchronous communication.

Course Outcome :

After completing the course, students should be able to:

1. Understand and analyze the performance of computer systems and know how to improve their efficiency.
2. Get acquainted with the concepts of computer Arithmetic operations.
3. Learn the internal organization of memory system and various types of memory unit.

4. Understand the architecture and instruction set of 8085
5. Write assembly language programs using 8085 instruction set.
6. Understand interfacing with various peripheral devices

Text Books:

1. Patterson, *Computer Organisation and Design*, Elsevier Pub, Delhi.
2. William Stalling, "*Computer Organization*", PHI, Delhi.
3. Mano, "*Computer System Architecture*", PHI, Delhi.
4. Ramesh S Gaonker, *Microprocessor Architecture, Programming and Applications with 8080/8085*, Willey Eastern Ltd. New Delhi.

DCS-450	COMPUTER HARDWARE AND MAINTENANCE	3L:1T:0P	3 credits
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UNIT – I **(L-8)**

Motherboard and its component: Motherboard: Bus, motherboard components, Battery connections on the motherboard, Keeping CPU cool, Motherboard trouble shooting, Processor socket and slots, CPU-concept like address lines, data lines, internal registers, modes of operation of CPU.

UNIT – II **(L-8)**

Peripheral & Storage devices: Input and output devices, printers, scanner, hard disk construction and working, Terms Related to Hard disk-Track, sector, cylinder, cluster, landing zone, MBR, Zone Recording and Formatting, Compact disk drive: CD-R, CD- W, CD-RW, DVD: DVD-R, DVD-RW Blue ray disk specification.

UNIT-III **(L-8)**

Display devices and Interfacing: Introduction of display devices, construction and working of display devices – CRT (Cathode Ray Tube), LCD (Liquid Crystal Display), Plasma Display, Technology, Block Diagram of Video Accelerator card.

UNIT-IV **(L-8)**

Network Devices: Hub, Switch, Router, Bridge, Gateway, Ethernet Card.

UNIT –V **(L-8)**

Power Supply: Block diagram & working of SMPS, Power supply characteristics- Efficiency, Regulation, Ripple, Load Regulation, Line Regulation. UPS (uninterrupted power supply), Working of UPS, Advantages and disadvantages of UPS.

Course Outcome :

After completing the course, students should be able to:

1. To understand the purpose and functions of the computer peripherals; understand diagnostic procedures and troubleshooting techniques to personal computers,
2. To portable devices, operating systems and computer peripherals.
3. To understand the relationship between hardware and software
4. To classify and explain the function of different computer hardware components

Text Books

1. RON GILSTER, “*PC Hardware: A Beginner’s Guide*” McGraw-Hill.
2. S.S.Velankar, Mrs Y C KulkarnI,”*Computer Hardware And Maintenance*”, NiraliPrakas

DCS-420P	DATA STRUCTURE USING 'C' Lab	0L:0T:2P	2 credits
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Note : Minimum eight experiments have to be performed

1. Inserting and deleting elements in an array.
2. Insertion and deletion of elements in linked list.
3. Stack implementation using arrays.
4. Stack implementation using pointers.
5. Queue implementation using arrays.
6. Linear search in a given list.
7. Binary search in a given list.
8. Implementation of binary search tree.
9. Implementation of bubble sort algorithm.
10. Implementation of insertion sort algorithm.

Laboratory Outcome

At the end of this lab session, the student will

1. Be able to design and analyze the time and space efficiency of the data structure
2. Be capable to identify the appropriate data structure for given problem
3. Have practical knowledge on the applications of data structures
4. To implement various searching and sorting algorithm.

DCS-440P	MICROPROCESSOR LAB	0L:0T:2P	2 credits
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Note : Minimum Five experiments have to be performed

1. Assembly language programming: - Programming of simple problems.
2. Simple programming problems using 8085 and 8086 microprocessor. Trainer kit to gain competence in the use of
 - (a) 8085 and 8086 Instruction set.
 - (b) Support chips of 8085 and 8086.
3. To identify various components, devices and sections of computer.
4. To Study the motherboards
5. To interconnect the system unit with the video monitor, mouse and key board and test the operation of the computer.
6. To connect various add on cards and I/O devices to a computer motherboard and test their working.

Laboratory Outcome

At the end of this lab session, the student will

1. Understand and apply the fundamentals of assembly level programming of microprocessors
2. Knowledge about the motherboard
3. Architecture and programming of the microprocessor 8085.
4. Learning about interfacing and various applications of microprocessor.

DCS-450P	COMPUTER HARDWARE AND MAINTENANCE LAB	0L:0T:2P	2 credits
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Note : Minimum eight practical's have to be performed

1. Study of floppy drive, CD-Drive and Hard disk
2. Perform Basic Input / Output system (BIOS) setting and configuration setup using complementary metal oxide semiconductor (CMOS).
3. Format, Partition and install a Hard disk drive (HDD) and format a pen drive.
4. Find faults related monitor, CPU, Hard disk, Printer and other peripheral devices.
5. Install and understand the working of printer.
6. Study and troubleshooting of network and power supplies.
7. Troubleshooting and repair Dot-matrix Printer and Inkjet printer.
8. Assemble PC and Install an operating system.
9. Study of devices on motherboard.
10. Use diagnostic software to identify installed computer peripherals and test their working conditions

Laboratory Outcome

At the end of this lab session, the student will

1. Install, configure, optimize and upgrade personal computers
2. Install, configure, optimize and upgrade the operating system; to be able to perform diagnostic procedures and troubleshooting techniques to personal
3. Computers, portable devices, operating systems and computer peripherals.