CODE NO	SUBJECT NAME	Instruction periods per week				Max Marks		Credits
		Lecture	Tutorial	Lab	Total	Sessional Marks	Semester End Marks	
CSE221	DATA COMMUNICATIONS	4	1	-	5	40	60	4
CSE222	MICROPROCESSORS AND INTERFACING	3	1	-	4	40	60	3
CSE223	OPERATING SYSTEMS	4	1	-	5	40	60	4
CSE224	COMPUTER ORGANIZATION	4	1	-	5	40	60	4
CSE225	FORMAL LANGUAGES AND AUTOMATA THEORY	4	1	-	5	40	60	4
CSE226	MICROPROCESSOR & INTERFACING LAB	-	-	3	3	50	50	2
CSE227	OPERATING SYSTEMS LAB	-	-	3	3	50	50	2
CSE228	HARDWARE LAB	-	-	3	3	50	50	2
Total		***19***	***5***	***9***	***33***	***350***	***450***	***25***

……DATA COMMUNICATIONS……

UNIT 1:

Data Communications, Data Networking, Internet: A Communications Model, Data Communications, Networks, The Internet, An Example Configuration, Protocol Architecture.

The Need for a Protocol Architecture: The TCP/IP Protocol Architecture, The OSI Model, Traditional Internet-Based Applications,Characteristics of Data,Transmission: Concepts and Terminology, Analog and Digital Data Transmission, Transmission Impairments.

UNIT 2:

Transmission Media:

Guided Transmission Media, Wireless Transmission Data Encoding, Digital Data, Digital Signals, Analog Signals, Analog.

UNIT 3:

The Digital Data Communication Techniques:

Asynchronous and Synchronous Transmission, Line Configurations, Interfacing.Data Link Control Flow Control, Types of Errors, Error Detection, Error Control, High-Level Data Link Control (HDLC).

UNIT 4:

Local Area Network:

Overview, LAN Protocol Architecture, Bridges, Layer 2 and Layer 3 Switches.

High-Speed LANs: The Emergence of High-Speed LANs.Wireless LANs:Overview,Wireless LAN Technology,IEEE 802.11 Architecture and Services.

UNIT 5:

Modems and Modem Circuits. Multiplexing: Frequency-Division Multiplexing, Synchronous Time-Division Multiplexing: Characteristics, TDM Link Control, Digital Carrier Systems Statistical Time-Division Multiplexing: Characteristics, The Concept of Spread Spectrum,Frequency Hopping Spread Spectrum,Direct Sequence Spread Spectrum,Code-Division Multiple Access.

TEXT BOOKS

W8thillia Edmiti oStaln. lings, "Data and Computer Communications" , Pearson Education Inc., 2010

REFERENCE BOOKS

Behrouz A. Forouzan, "Data Communications and Networking", TMH, 2004, 3rd Edition.

……..MICRO PROCESSORS……..

UNIT I

The 8085A µP. Architecture and Instruction Set:

Introduction to Microprocessors and Microcomputers, Internal Architecture and Functional/Signal Description of typical 8-bit µP.- 8085, Instruction Set and Timing Diagrams of 8085 µP. Interfacing SRAMs, and EPROMs to 8085.

15 h

UNIT II

Programming the 8085 µP.:

Assembly Language Programming Requirements, Programming Techniques: Looping, Counting, and Indexing, Counter and timing Delays, Stack and Subroutines, Code Conversion, BCD Arithmetic, 16-bit data Operations, Interrupts and Interrupt Service Routines

10h

UNIT III

Interfacing Peripheral ICs to Intel 8085

Parallel I/O Interface - 8255, Serial I/O Interface – 8251, Timer Interface - 8253, Keyboard/Display Interface - 8279, Interrupt Controller Interface - 8259,D/A Conversion Methods, A/D Conversion methods, Interfacing DAC, Interfacing ADC.

20h

UNIT IV

The 8086 µP. Architecture and.:

Internal Architecture and Functional/Signal Description of 8086/8088

Segmented Memory, Maximum-Mode and Minimum-Mode Operation, Addressing Modes.

10h

UNIT V

Programming the 8086 µP

Instruction Set and Timing Diagrams Assembly Language Requirements, Data Definition, Loops

Procedures, Modular programming, and Macros

5h

TEXT BOOKS:

1. Ramesh S. Gaonkar, "Microprocessor Architecture, Programming, and Applications with the 8085"

Penram International ,6th Edition,

2. John E.Uffenbeck, "The 80x86 Family, Design, Programming and Interfacing3rdEdition, Pearson Education Inc.", 2002

…….Operating Systems……

UNIT I

Introduction to OS

Introduction to operating systems – review of computer organization – operating system structures – system calls – system programs – system structure – virtual machines. **Process Management**

Processes: Process concept – Process scheduling – Operations on processes –Cooperating processes – Interprocess communication. Multi threaded programming. Communication in client-serversystems. Multi-Threaded Programming:Overview; Multithreading models; Thread Libraries; Threading issues.

UNIT II

Process Scheduling and Synchronization

CPU Scheduling: Scheduling criteria – Scheduling algorithms – Multiple-processorscheduling – Real time scheduling – Algorithm Evaluation. Process Synchronization: The critical-section problem –Synchronization hardware – Semaphores – Classic problems of synchronization – critical regions – Monitors. Deadlock: System model – Deadlock characterization –Methods for handling deadlocks – Deadlock prevention – Deadlock avoidance, Deadlock detection – Recovery from deadlock.

UNIT III

Memory Management

Memory Management: Background – Swapping – Contiguous memory allocation – Paging – Segmentation – Segmentation with paging. Virtual Memory: Background – Demand paging – Process creation – Page replacement – Allocation of frames – Thrashing.

UNIT IV

File Systems and its Implementation

File-System Interface: File concept – Access methods – Directory structure – Filesystem mounting – Protection. File-System Implementation : Directory implementation – Allocation methods – Free-space management – efficiency and performance – recovery – log-structured file systems.

UNIT V

Secondary Storage Structures and Protection

Mass storage structures; Disk structure; Disk attachment; Disk scheduling; Disk management; Swap space management. Protection: Goals of protection, Principles of protection, Domain of protection, Access matrix, Implementation of access matrix, Access control, Revocation of access rights, Capability-Based systems.

Case Study: The Linux Operating System: Linux history; Design principles; Kernel modules; Process management; Scheduling; Memory management; File systems, Input and output; Interprocess communication

TEXT BOOKS

1. Silberschatz, Galvin, and Gagne, "Operating System Concepts", Wiley India Pvt Ltd, 2003, Sixth Edition.

REFERENCES

1. Andrew S. Tanenbaum, "Modern Operating Systems", Pearson Education, 2004, Second Edition.
2. Gary Nutt, "Operating Systems", Pearson Education, 2004 ,Third Edition.
3. Harvey M. Deitel, "Operating Systems", Pearson Education, 2004, Third Edition.

…….Computer Organisations……..

UNIT-1

Register Transfer and Micro operations :

Register Transfer Language, Bus and Memory Transfers, Arithmetic, Logic and Shift Micro operations, Arithmetic Logic Shift Unit, **Computer Arithmetic:**

Introduction, Addition and Subtraction, Booth Multiplication Algorithm, Decimal Arithmetic Unit.

UNIT-2

Basic Computer Organization:

Instruction Codes, Computer Registers, Computer Instructions, Timing and Control, Instruction Cycle, Memory-Reference Instructions, Input-Output and Interrupt, Complete Computer Description.

UNIT-3

Control Design:

Hardwired & Micro Programmed (Control Unit), Control Memory, Address Sequencing, Conditional and Unconditional Branching, Micro program Example.

UNIT-4

Central Processing Unit:

Introduction, General Register Organization, Stack Organization, Instruction Formats, Addressing Modes with numerical examples, Data Transfer and Manipulation, Program Control, Program Interrupt, Types of interrupts, CISC Characteristics, RISC Characteristics. Introduction to Parallel Processing, Pipelining – General Considerations.

UNIT-5

Input-Output Organization:

Peripheral Devices, Input-Output Interface, Asynchronous Data Transfer, Modes of Transfer, Priority Interrupt, Direct Memory Access.

Memory Organization:

Memory Hierarchy, Main Memory, Auxiliary Memory, Associative Memory, Cache Memory, Virtual Memory.

TEXT BOOKS

1. M.Morris Mano, "Computer System Architecture", Pearson Education Inc., 2003, Third Edition,.

REFERENCE BOOKS

1. John D. "Carpinelli ,Computer Systems Organization and Architecture", Pearson Education Inc., 2003.

……..Finite Automata…….

UNIT -1

Introduction to Finite Automata: Introduction to Finite Automata; The Central concepts of Automata theory; Deterministic finite automata;Nondeterministic finite automata.

Finite Automata, Regular Expressions: An application of finite automata ;Finite automata with Epsilon-transitions; Regular expressions; FiniteAutomata and Regular Expressions; Applications of Regular Expressions. Two way finite automata, finite automata with output**:** Mealy and Moore machines.

UNIT -2

Regular Languages, Properties of Regular Languages: Regular languages; Proving languages not to be regular languages; Closure propertiesof regular languages; Decision properties of regular languages; Equivalence and minimization of automata. Pumping lemma, closure properties, decision algorithm, MyHill- Nerode theorem and minimization of finite automata.

UNIT -3

Context-Free Grammars And Languages : Context –free grammars; Parse trees; Applications; Ambiguity in grammars and Languages

UNIT -4

Pushdown Automata: Definition of the Pushdown automata; the languages of a PDA;

Equivalence of PDA's and CFG's; Deterministic PushdownAutomata.

Properties of Context-Free Languages: Normal forms for CFGs; The pumping lemma for CFGs; **Closure properties of CFLs**

UNIT -5

Introduction To Turing Machine: Problems that Computers cannot solve;The turing machine; Programming techniques for Turning Machines;Extensions to the basic Turing Machines; Turing

Machine and Computers.church's hypothesis. The classes P and NP; NP-Completeness; Satisfiability and Cook's theorem; Polynomial reduction and some NP-complete problems. **Undecidability**: properties of recursive and recursively enumerable languages, universal Turing machines, Rice's theorem, Post Correspondence Problem, Greibach's theorem, introduction to recursive function theory, Oracle computation; Chomsky Hierarchy**:** regular grammars, unrestricted grammars, context sensitive languages, relations between classes of languages.

TEXT BOOKS

1.John E. Hopcroft, Rajeev Motwani, Jeffrey D.Ullman: "Introduction to Automata Theory, Languages and Computation", Pearson Education, 2007,3rd Edition.