

INTERNATIONAL INSTITUTE OF PROFESSIONAL STUDIES

DEVI AHILYA UNIVERSITY, INDORE

M. Tech.(IT) 5 Years

Batch 2k16

Semester -VII

JULY-DECEMBER 2019

Sub. Code	Subject Name	L	T	P	C
IT-711	Advanced Database Management System	3	1	0	4
IT-702A	Theory Of Computation	3	1	0	4
IT-712	Computer Graphics and Multimedia	3	1	0	4
IT-705	Operating System	3	1	0	4
IT-709A	Computer Graphics and Multimedia Lab	0	0	4	2
IT-710	Project	0	0	4	4
IT-707	Comprehensive Viva	0	0	4	4
Total					26

INTERNATIONAL INSTITUTE OF PROFESSIONAL STUDIES, DAVV, INDORE

M. Tech. (IT) 5 Years VII SEMESTER

IT-711: Advanced Database Management System

Aim of Course: To learn advanced features of DBMS and build capacity to implement and maintain an efficient database system using emerging trends.

Objectives:

The course is designed to make students:

- Be able to master the concepts and design with proficiency databases under the relational model.
- Proficiency in the choice of DBMS platform to use for specific requirements
- Be proficient with a broad range of data management issues including data integrity and security, transaction processing and others.
- Be familiar with the fundamentals of distributed DBMS and object database management, data warehousing and data mining

Course Contents:

UNIT I

Introduction with DBMS and ER Model : Advantage of DBMS approach, various view of data, data independence, schema and sub-schema, primary concepts of data models, Database languages, transaction management, Storage management Database administrator and users, overall system architecture.

Basic concepts of ER model, design issues, mapping constraint, keys, ER diagram, weak and strong entity sets, specialization and generalization, aggregation, inheritance, design of ER schema.

UNIT II

Functional Dependencies and Normalization: Domains, relations, keys, super key, candidate, primary, alternate and foreign keys, Functional dependence, Full Functional dependence, trivial dependencies, transitive dependencies, Mutual independence, closure set of dependencies, non loss decomposition, FD diagram. Introduction to normalization, first, second, third Normal forms, dependency preservation, BCNF, Multivalued dependencies and fourth normal form.

UNIT III

PL/SQL fundamentals: Variables, reserve words, identifiers, anchored data types, blocks, labels, use of DML in PL/SQL, commits, rollback, savepoint, conditional control: if, case, nullif, coalesce, iterative processing with loops: Loop basics , simple loops, while, for loop.

UNIT IV

Database Integrity, Transaction, concurrency and Recovery: Basic idea of Database Integrity, Integrity rules, assertions, integrity Constraints, triggers.

Basic concepts of Transaction, ACID properties, Transaction states, implementation of atomicity and durability, concurrent executions, Serializability, Conflict serializability, View serializability, basic idea of concurrency control, Concept of locking, types of locks, basic idea of deadlock, deadlock handling.

UNIT V

Distributed Database and Emerging Fields in DBMS: Basic idea of Distributed database, distributed data storage, data replication, data fragmentation- horizontal vertical and mixed fragmentation.

Object oriented Databases-basic idea and the model, object structure, object class, inheritance, multiple inheritance, object identity.

Data warehousing- terminology, definitions, characteristics, data mining and it's overview, Database on www, multimedia Databases- introduction, similarity based retrieval, continuous media data, multimedia data formats, video servers.

Reference Books:

1. A Silberschatz, H.F Korth, Sudersan "Database System Concepts" , MGH Publication.
2. Modern Database Management (5th Edition) (Hardcover) by Fred R. McFadden, Jeffrey A. Hoffer, Mary B. Prescott
3. Elmasri & Navathe "Fundamentals of Database systems" – III ed.
4. B.C. Desai. "An introduction to Database systems" BPB.

INTERNATIONAL INSTITUTE OF PROFESSIONAL STUDIES, DAVV, INDORE
M. Tech. (IT) 5 Years VII SEMESTER
IT-702A: Theory Of Computation

Aim of Course: To make students know about the basic concepts of Computation and learn to work with mathematical abstractions of computers called a model of computation.

Objectives:

The course is designed to make students:

1. Understand regular expressions, which are used to specify string patterns in many contexts, from office productivity software to programming languages.
2. Study finite automata, another formalism mathematically equivalent to regular expressions, Finite automata are used in circuit design and in some kinds of problem-solving.
3. Learn Context-free grammars that used to specify programming language syntax.
4. Understand computability theory and decision problems.

Course Contents:

UNIT I

Formal languages: Introduction to Computation & Languages: Natural Languages, Computer Programming Languages and Formal Languages. Language Concepts: alphabet, strings, properties of Strings, Kleene closure.

Properties of Formal Languages.

Grammar: Chomsky Hierarchy of grammar, languages represented by type 0,1,2,3 grammars.

UNIT II

Regular languages and finite automata-recursive definition, regular expression and corresponding languages, Pumping Lemma for non-regular languages. Finite automata, Kleene's theorem, non-deterministic finite automata. Equivalence of FAs and NFAs. Minimal state finite automata, Mealy machine and Moore machine, Regular grammar and their equivalence to finite automata.

UNIT III

Context free languages Parsing, ambiguity, parse trees, parsing methods: Bottom up and top down, Simplification of grammar. Normal form of CFGs: Chomsky Normal Form and Greibach Normal Form, CKY algorithm, Closure Properties of CFLs

UNIT IV

Push Down Automata: definition, examples, deterministic PDA, non-deterministic PDA, Parsing and PDAs, PDA and Context Free Languages

UNIT V

Turing machines – models of computations, definition, Representation of Turing Machines, TMs as language acceptors, Techniques for TM construction, Church - Turing thesis, Universal Turing machines, Variants of Turing machine.

Unsolvable Decision Problems- Decidability, Decidable Languages, Undecidable Languages Halting Problem of Turing Machine.

Reference Books:

1. Hopcraft and Ullman, Introduction to Automata Theory, Languages and Computation, Narosa Publishing House.
2. K.L.P. Mishra, N. Chandrasekaran, Theory of Computer Science (Automata, Languages and Computation), Prentice Hall of India.
3. Peter Linz, An Introduction to Formal Languages and Automata, Narosa Publishing House.
4. Cohen Daniel I.A., Introduction to Computer Theory, John Weley and Sons , inc New York
5. Martyn John C, Introduction to Languages and Theory of Computation, McGraw Hill, N.Y. (Internal Edition McGraw Hill)
6. Mandrioli Dino, Ghezzi Carlo, Theoretical Fundamentals of Computer Science, John Weley and Sons, Inc , New York.

INTERNATIONAL INSTITUTE OF PROFESSIONAL STUDIES, DAVV, INDORE

M. Tech. (5 Years) VII Semester
IT -712: Computer Graphics & Multimedia

Aim: To impart the fundamental concepts of Computer Graphics and Multimedia.

Objectives:

- To study the graphics techniques and algorithms.
- To study the multimedia concepts and various I/O technologies.
- To enable the students to develop their creativity

Course Contents:

Unit- I

Introduction:

Application of Computer Graphics, Raster Graphics Fundamentals: Scan conversion, Pixel, Frame Buffer. Graphics Primitives; Line algorithms Circle algorithms, Ellipse, Character generation, Polygon Representation, inside test, Polygon filling algorithms, Antialiasing.

Unit- II

Display devices:Random scan and Raster scan monitors, Colors CRT monitor, Plasma Panel;

Hard Copy devices:Printers and Plotters; Input devices:Joysticks, Mouse, Digitizer, Scanner, and Camera; Input Techniques;

Unit- III

Windowing and clipping:2D Transformation, Raster method of Transformation,Window, View port, Viewing, Window to View port Transformation, Line clipping algorithms, Polygon clipping algorithms.

Unit-IV

Multimedia: Introduction and Applications, Components of multimedia, Fundamentals of Information theory, Multimedia Authoring tools, Basics of Computer Animation (Design, types of animation, using different functions),Hypermedia, multimedia applications

Unit-V

Computer based Animation (Design and Programming)

Basic concepts , Animation design techniques, animation design using Macromedia flash : Drawing overview, Symbols, layers, Types, Buttons, sound creating animation, Publishing flash movies. Frame actions, Button actions, Variables and data types, Basic actions, Conditionals and operators, loops handling events, sound programming, color programming

Reference Books :

1. Computer Graphics: Donald Hearn and M.Pauling Baker, Prentice Hall of India. .
2. Procedural Element of Computer Graphics: David F. Rogers McGraw Hill International.
3. Multimedia Computing, Communications & Applications: Ralf and Klara, Prentice Hall.
4. Multimedia: Making It Work: [Tay Vaughan](#), Tata McGraw-Hill Education, 01-Jan-2006

INTERNATIONAL INSTITUTE OF PROFESSIONAL STUDIES, DAVV, INDORE
M. Tech. (IT) 5 Years VII SEMESTER
IT-705: Operating System

Aim of Course: To make the students familiar with design of operating systems as resource manager of a computer system.

Objectives:

The course is designed to make students:

- To present basic concepts of operating system architecture
- Understand the concepts of processor management and memory management techniques
- Study deadlock handling and inter-process communication
- Study file systems and device management.

Course Contents:

UNIT I

Introduction to Operating System:- Objectives and functions and the services provided by OS.

Evolution of operating system:- Concepts of batch processing, multiprogrammed batched system, time-sharing systems, Parallel Systems, Distributed systems. Operating system structure: -System calls and system programs.

UNIT II

Process Management: -Process concept, Process states, Process scheduling , Operations on processes , Co-operating processes and IPC.

CPU scheduling: - Basic concept and scheduling criteria, Long term, short term medium term schedulers, Scheduling algorithms, Multi-Processors Scheduling, Measurement of performance of processor.

UNIT III

Process synchronization: - Critical section problem, Mutual exclusion and synchronization, Concept of semaphores, Classical IPC problems. Deadlocks: - Characterization of deadlock, Methods of handling prevention, detection and avoidance, Recovery from deadlock.

UNIT IV

Memory management:-Logical and physical address spaces, Swapping and paging, Contiguous, allocation and its drawbacks, Non-contiguous allocation. Virtual memory: - Demand paging and its need, Performance of demand paging, Page replacement and its need, Thrashing and allocation of frames.

File system interface: - File concept, access methods, Directory structure, protection and consistency. File system structure, Allocation methods, Free space management, Efficiency and performance, Coincidence, protection and sharing.

UNIT V

I/O system: - Various i/o devices, Device drivers, structure of I/O software, Transforming I/O request of h/w operation. Secondary storage structure:- Disk structure, Disk Scheduling, Disk management, Swap space management and Disk reliability.

Note:- Case study of windows and Unix operating system is to be done as assignment.

Text Book:

1. Silberschatz , Gagne, Galvin, Operating System concept, 8th edition, WILEY.

Reference Books:

1. D. M. Dhamdhare, System Programming and operating system, Tata McGraw Hill, 3rd edition.
2. Gary Nutt, Operating Systems, 3rd edition Pearson Education.
3. Andrew S. Tanenbaum, 3rd edition Modern Operating Systems

INTERNATIONAL INSTITUTE OF PROFESSIONAL STUDIES, DAVV, INDORE
M. Tech. (IT) 5 Years VII SEMESTER
Lab Assignment

IT-709A:Computer Graphics & Multimedia Lab

PROGRAM 1:

Procedure to create an animation to represent the growing moon.

PROGRAM 2:

Procedure to create an animation to indicate a ball bouncing on steps.

PROGRAM 3:

Procedure to simulate movement of a cloud.

PROGRAM 4:

Procedure to draw the fan blades and to give proper animation.

PROGRAM 5:

Devise a routine to produce the animation effect of a square transforming to a triangle and then to a circle.

PROGRAM 6:

Create a web page for a clothing company which contains all the details of that company and at least five links to other web pages.

PROGRAM 7:

Procedure to display the background given(filename: tulip.jpg) through your name.

PROGRAM 8:

Procedure to simulate a ball hitting another ball.

PROGRAM 9:

Procedure to create an animated cursor using `tartdrag("ss", true); mouse.hide();`

PROGRAM 10:

Procedure to design a visiting card containing atleast one graphic and text information.

PROGRAM 11:

Procedure to take a photographic image. give a title for the image. put the border. write your names. write the name of institution and place.

PROGRAM 12:

Procedure to prepare a cover page for the book in your subject area . plan your own design

PROGRAM 13:

Procedure to extract the flower only from given photographic image and organise it on a background. selecting your own background for organisation.

PROGRAM 14:

Procedure to adjust the brightness and contrast of the picture so that it gives an elegant look.

PROGRAM 15:

Procedure to position the picture preferably on a plain background of a colour of your choice -positioning includes rotation and scaling.

PROGRAM 16:

Procedure to remove the arrows and text from the given photographic image.

PROGRAM 17:

Procedure to type a word and apply the effects shadow emboss

PROGRAM 18:

Procedure to use appropriate tool(s) from the toolbox, cut the objects from 3 files (f1.jpg, f2.jpg& f3.jpg); organise them in a single file and apply feather effects.

PROGRAM 19:

Procedure to display the background given (filename: garden.jpg) through your name using mask.

PROGRAM 20:

Procedure to make anyone of one of the parrots black & white in a given picture.

PROGRAM 21:

Procedure to change a circle into a square using flash.