UNIVERSITY OF ENGINEERING & MANAGEMENT, JAIPUR

Lecture-wise Plan

Subject Name: Distributed Database Management   Subject Code-MCAE501A

Year:3rd Year   Semester: Fifth

Module Number	Topics	Number of Lectures
1	**OVERVIEW OF STORAGE AND INDEXING, DISKS AND FILES**	**6L**
	1. Data on external storage; File. Organizations and indexing;	2
	2. Index data structures; Comparison of file organizations; Indexes and	2
	3. Performance tuning. Memory hierarchy; RAID; Disk space management;	1
	4. Buffer manager; Files of records; Page formats and record formats.	1
2	**TREE STRUCTURED INDEXING**	**4L**
	1. Intuition for tree indexes;	1
	2. Indexed sequential access method;	1
	3. B+ trees, Search, Insert, Delete, Duplicates,	1
	4. B+ trees in practice.	1
3	**HASH-BASED INDEXING**	**4L**
	1. Static hashing;	2
	2. Extendible hashing, linear hashing, comparisons.	2
4	**OVERVIEW OF QUERY EVALUATION, EXTERNAL SORTING:**	**8L**
	1. The system catalog; Introduction to operator evaluation; Algorithms for relational operations;	2
	2. Introduction to query optimization; Alternative plans: A motivating example;	2
	3. What a typical optimizer does. When does a DBMS sort data? A simple two-way merge sort;	2
	4. External merge sort	2
5	**EVALUATING RELATIONAL OPERATORS**	**6L**
	1. The Selection operation; General selection conditions; The Projection operation;	2
	2. The Join operation; The Set operations; Aggregate operations;	1
	3. The impact of buffering Concurrency control and recovery system: Lock based protocol, dead lock handling, time stamp based and validation based protocol, failure classification, storage, recovery algorithm,	2
	4. Recovery and atomicity, backup.	1

6	**A TYPICAL RELATIONAL QUERY OPTIMIZER:**		**4L**
	1. Translating SQL queries in to Relational Algebra;		1
	2. Estimating the cost of a plan; Relational algebra equivalences; Enumeration of alternative plans; Nested subqueries;		2
	3. Other approaches to query optimization.		1
7	**PHYSICAL DATABASE DESIGN AND TUNING**		**6L**
	1. Introduction; Guidelines for index selection, examples;		1
	2. Clustering and indexing; Indexes that enable index-only plans; Tools to assist in index selection;		2
	3. Overview of database tuning; Choices in tuning the conceptual schema;		2
	4. Choices in tuning queries and views; Impact of concurrency; DBMS benchmarking.		1
8	**MORE RECENT APPLICATIONS**		**3L**
	1. Mobile databases; Multimedia databases;		1
	2. Geographical Information Systems; Genome data management.		2
Total Number Of Hours = 41			

Faculty In-Charge   HOD, CSE Dept.

Subject Name: Distributed Database Management   Subject Code-MCAE501A
Year:3rd Year   Semester: Fifth

Assignment:

Module-I:

1. How do you organize file in a database?
2. What do you mean by RAID? What is indexing?

Module-II:

1. What do you mean by B+ trees
2. How do you Search, Insert, and Delete elements from B+ tree?

Module-III:
1. What do you mean by hashing? Explain Static hashing.
2. Differentiate Extendible hashing, linear hashing.

Module-IV:

1. How query optimization is done on database? Explain with proper example.
2. What a typical optimizer does in DBMS? When does a DBMS sort data? How two-way merge sort has done in DATABASE?

Module-V:
1. What is Lock based protocol? How dead lock is handled in DBMS?
2. Explain time stamp based and validation based protocol

Module-V:
1. How translation of SQL queries in to Relational Algebra is done? Explain with a example
2. What do you mean by Relational algebra equivalences?

Module-V:
1. Explain Clustering and indexing.
2. What do you mean by view and DBMS benchmarking.

Module-V:

1. What do you mean by mobile database?
2. Explain Geographical Information Systems and Genome data management.

UNIVERSITY OF ENGINEERING & MANAGEMENT, JAIPUR
Lecture-wise Plan

Subject Name: Image Processing **Subject Code-MCAE501B**
Year: 3rd Year **Semester: Fifth**

Module Number	Topics	Number of Lectures
1.	**Introduction:**	**4L**
	1. Background, Digital Image Representation,	1
	2. Fundamental steps in Image Processing	1
	3. Elements of Digital Image Processing – Image Acquisition, Storage, Processing, Communication, Display.	2
2.	**Digital Image Formation**	**6L**
	1. A Simple Image Model, Geometric Model- Basic Transformation (Translation, Scaling, Rotation),	3
	2. Perspective Projection,	1
	3. Sampling& Quantization - Uniform & Non-uniform	2
3.	**Mathematical Preliminaries**	**8L**
	1. Neighbour of pixels, Connectivity, Relations, Equivalence & Transitive Closure;	2
	2. Distance Measures, Arithmetic/Logic Operations, Fourier Transformation,	3
	3. Properties of The Two Dimensional Fourier Transform, Discrete Fourier Transform, Discrete Cosine & Sine Transform	3
4.	**Image Enhancement**	**10L**
	1. Spatial Domain Method, Frequency Domain Method, Contrast Enhancement –Linear& Nonlinear Stretching	3
	2. Histogram Processing; Smoothing - Image Averaging, Mean Filter, Low-pass Filtering; Image Sharpening. High-pass Filtering, High-boost Filtering	4
	3. Derivative Filtering, Homomorphic Filtering; Enhancement in the frequency domain - Low pass filtering, High pass filtering.	3
5.	**Image Restoration**	**6L**
	1. Degradation Model, Discrete Formulation, Algebraic Approach to Restoration – Unconstrained & Constrained	2
	2. Constrained Least Square Restoration, Restoration by Homomorphic Filtering,	2
	3. Geometric Transformation - Spatial Transformation, Gray Level Interpolation	2
6.	**Image Segmentation**	**8L**
	1. Point Detection, Line Detection, Edge detection, Combined detection, Edge Linking & Boundary Detection - Local Processing	3
	2. Global Processing via The Hough Transform; Thresholding - Foundation, Simple Global Thresholding, Optimal Thresholding	3
	3. Region Oriented Segmentation - Basic Formulation, Region Growing by Pixel Aggregation, Region Splitting & Merging	2
Total Number Of Hours = 42		

Faculty In-Charge   HOD, CSE Dept.

Assignment :

Module -1 (Introduction)

Module -2 (Digital Image Formation)

Module -3 (Mathematical Preliminaries)

Module -4 (Image Enhancement)

Module -5 (Image Restoration)

Module -6 (Image Segmentation)

UNIVERSITY OF ENGINEERING & MANAGEMENT, JAIPUR

Lecture-wise Plan

Subject Name: Parallel Programming   **Subject Code-MCAE501C**

Year: 3Rd Year   **Semester: Fifth**

Module Number	Topics	Number of Lectures
1	**Introduction:**	**7L**
	Parallel Processing Environment Overview	1
	Pipelining and Data Parallelism	1
	Scalability, Flynn's Taxonomy	1
	Parallel Processing Organization- Mesh	1
	Hyper-Tree	1
	Pyramid and Butterfly	1
	Hypercube network	1
2	**Parallel Algorithm:**	**16L**
	Parallel Algorithms –Structure, cost, Analysis ;	2
	Elementary Algorithms: Broadcast, Prefix sums, All sums	2
	Algorithms on Selection problem,	2
	Merging-Odd-even merging network	2
	CREW Merging, N-ary searching	2
	Matrix Transposition	1
	Matrix Multiplications- 2D Mesh SIMD ,Hypercube SIMD, Shuffle-Exchange SIMD models.	3
	Discrete Fourier Transform, Fast Fourier Transform	2
3.	**Linear system of equations:**	**6L**
	Linear system of equations- Gaussian Elimination,	2
	Gauss-Seidel algorithm, Jacobi algorithm	1
	Sorting – Enumeration sort, Odd-even transposition sort,	2
	Bitonic merge Ellis's Algorithm	1
4	**Graph Algorithms:**	**8L**
	Graph Algorithms	2
	Spanning Tree Algorithms	2
	Parallel Programming Languages –FORTRAN 90,	2
	OCCAM	2
Total Number Of Hours = 37		

Faculty In-Charge   HOD, CSE Dept.

Assignment:

Module-1:
    1. What are the levels of parallel processing?
    2. What is pipelining? Discuss in detail principles of designing pipeline processor.

Module-2:
    1. Explain SIMD interconnection networks?
    2. What are the types of SIMD array processors?

Module-3:
    1. What is parallel algorithm? Explain the design process of Parallel Algorithms.
    2. Discuss different attributes of parallel algorithms?

Module-4:
    1. Explain row wise 1-D & 2-D partitioning parallel algorithm for Matrix-Vector Multiplication.
    2. What is Cannon's algorithm for Matrix multiplication? Discuss performance analysis of cannon's algorithm.

UNIVERSITY OF ENGINEERING & MANAGEMENT, JAIPUR

Lecture-wise Plan

Subject Name: System Administration & Linux　　　　**Subject Code-MCA502A**
Year: 3rd Year　　　　　　　　　　　　　　　　　　　**Semester: Fifth**

Module Number	Topics	Number of Lectures
1	**Introduction:**	**5L**
	1. Organization of UNIX.	2L
	2. User interface, Programmer interface.	3L
2	**System calls**	**12L**
	1. The environment of UNIX process System calls.	4L
	2. Process control, File related system calls.	4L
	3. Process related system calls. Signals programming using system calls.	4L
3	**I/O**	**4L**
	1. Advanced I/O multiplexing. Memory mapped I/O.	4L
4	**Inter-process communications**	**9L**
	1. Interprocess communication: Pipes, shared memory, semaphores, messages.	5L
	2. Advanced inter-process communications. Streams, Pipes, Open server	4L

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Assignment:
Module-1 (Introduction):
　　　1.　　User interface vs programmer interface

Module-2 (System calls):
　　　1.　　Different system calls.

Module-3 (I/O):
　　　1.　　Advanced Memory mapped I/O

Module-4 (Interprocess communication):
　　　1.　　Interprocess communication
　　　2.　　Pipes

UNIVERSITY OF ENGINEERING & MANAGEMENT, JAIPUR

Lecture-wise Plan

Subject Name: Windows Programming with VB　　　　**Subject Code-MCA502B**
Year: 3rd Year　　　　　　　　　　　　　　　　　　**Semester: Fifth**

Module Number	Topics	Number of Lectures
1	**Introduction to Windows Programming and Visual Basic:**	**12L**
	Components of Windows Programming: Graphical User Interface – Window and its elements – Dialog Box – Drop-Down and Pop-Up menus – Visual Basic – Event-Driven Programming – Steps in Building a Project – User Interface Design – Writing Code – Visual Basic IDE – Creating and Running a simple project	12L
2	**Visual Basic Forms and Controls:**	**8L**
	Form – Tool Box controls – Property window – Design and Run-time properties – Events – Keyboard, Mouse, Code and System events – Visual Basic Object oriented programming – Creating buttons at run-time through object declaration - Screen, Printer, Error Objects	8L
3.	**Visual Basic Programming:**	**9L**
	Visual Basic Data Types - Constants: predefined constants – User-Defined constants – Variables – Scope Rules – Control Structures – If – Select Case – Loops – FOR , DO, WHILE loops – Goto – On Goto statements – Event procedures – User defined procedures – Library functions – Numeric, String, Boolean and miscellaneous functions – Sub Main() procedure – User-defined functions – Public, Private Scope rules – Creating EXE files – Arrays – User-defined data type – Type statement – Control Arrays – Graphics handling – Using multiple forms – Activating a form – Multiple Document Interface – A simple MDI application	9L
4	**Visual Basic Advanced Features Creating a Database in VB**	**10L**
	Accessing an external database with Data Control – Object Linking and Embedding (OLE): Linking and embedding an excel worksheet with VB project – Using third-party controls in VB - Creating an Active X control project – Activating other applications from VB – Windows Application Program Interface functions (WINAPI)	10L
	Total =	**39L**

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Assignment:
1. **Minor project (Window Application)**
2. **Major project (Window application)**

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Lecture-wise Plan

Subject Name: Advanced UNIX **Subject Code-MCA503A**

Year: 3rd Year Semester: Fifth

Module Number	Topics	Number of Lectures
1	**Introduction:**	**6L**
	1. Overview, Network of Networks, Intranet, Extranet and Internet.	1L
	2. **World Wide Web:** Domain and Sub domain, Address Resolution, DNS, Telnet, FTP, HTTP.	1L
	3. **Review of TCP/IP:** Features, Segment, Three-Way Handshaking, Flow Control, Error Control, Congestion control, IP Datagram, IPv4 and IPv6.	1L
	4. **IP Subnetting and addressing:** Classful and Classless Addressing, Subnetting. NAT, IP masquerading, IP tables.	1L
	5. **Internet Routing Protocol:** Routing - Intra and Inter Domain Routing, Unicast and Multicast Routing, Broadcast.	1L
	6. **Electronic Mail:** POP3, SMTP.	1L
2	**HTML, Image Maps, Extensible Markup Language, CGI Scripts:**	**9L**
	1. Introduction of Editors, Elements, Attributes, Heading, Paragraph. Formatting, Link, Head, Table, List, Block, Layout, CSS. Form, Iframe, Colors, Colorname, Colorvalue.	3L
	2. Map, area, attributes of image area.	1L
	3. Introduction of Tree, Syntax, Elements, Attributes, Validation, Viewing. XHTML in brief.	4L
	4. Introduction, Environment Variable, GET and POST Methods.	1L
3	**PERL, JavaScript, Cookies, Java Applets:**	**10L**
	1. Introduction of Variable, Condition, Loop, Array, Implementing data structure, Hash, String, Regular Expression, File handling, I/O handling.	3L
	2. Basics, Statements, comments, variable, comparison, condition, switch, loop, break. Object – string, array, Boolean, reg-ex. Function, Errors, Validation.	4L
	3. Definition of cookies, Create and Store a cookie with example.	1L

	4.	Container Class, Components, Applet Life Cycle, Update method; Parameter passing applet, Applications.	2L
4	**Client-Server programming In Java, Threats,Network security techniques, Firewall:**		**4L**
	1.	A) Java Socket, Java RMI. 1. B) Malicious code-viruses, Trojan horses, worms; eavesdropping, spoofing, modification, denial of service attacks.	2L
	2.	A) Password and Authentication; VPN, IP Security, security in electronic transaction, Secure Socket Layer (SSL), Secure Shell (SSH). B) Introduction of Packet filtering, Stateful, Application layer, Proxy	2L
5	**Internet Telephony, Multimedia Applications, Search Engine and Web Crawler:**		**5L**
	1.	Introduction of VoIP.	1L
	2.	Multimedia over IP: RSVP, RTP, RTCP and RTSP. Streaming media, Codec and Plugins, IPTV.	2L
	3.	Definition, Meta data, Web Crawler, Indexing, Page rank, overview of SEO.	2L
Total Number Of Hours = 34			

Faculty In-Charge   HOD, CSE Dept.

UNIVERSITY OF ENGINEERING & MANAGEMENT, JAIPUR
Lecture-wise Plan

Subject Name: Object Oriented Programming Using Java   **Subject Code-MCA503B**
Year: 3rd Year   **Semester: Fifth**

Module Number	Topics	Number of Lectures
1	**Introduction:**	**6L**
	1. Concepts of object oriented programming language, Major and minor elements, Object, Class.	2
	2. Relationships among objects, aggregation, links.	2
	3. Relationships among classes association, aggregation, using, instantiation, meta-class, grouping constructs.	2
2	**Object oriented concepts:**	**3L**
	1. Difference between OOP and other conventional programming – advantages and disadvantages.	1
	2. Class, object, message passing, inheritance, encapsulation, polymorphism.	2
3.	**Class & Object proprieties:**	**11L**
	1. Basic concepts of java programming – advantages of java, byte-code & JVM.	2
	2. Data types, access specifiers, operators, control statements & loops, array, creation of class, object, constructor, finalize and garbage collection.	2
	3. Use of method overloading, this keyword, use of objects as parameter & methods returning objects, call by value & call by reference	2
	4. Static variables & methods, garbage collection, nested & inner classes	2
	5. Basic String handling concepts- String (discuss charAt() , compareTo(), equals(), equalsIgnoreCase(), indexOf(), length() , substring(), toCharArray() , toLowerCase(), toString(), toUpperCase() , trim() , valueOf() methods) & StringBuffer classes (discuss append(), capacity(), charAt(), delete(), deleteCharAt(), ensureCapacity(), getChars(), indexOf(), insert(), length(), setCharAt(), setLength(), substring(), toString() methods).	2
	6. Concept of mutable and immutable string, command line arguments, basics of I/O operations – keyboard input using BufferedReader & Scanner classes.	1
	Reusability properties	**4L**

4	1. Super class & subclasses including multilevel hierarchy, process of constructor calling in inheritance.	1
	2. Use of super and final keywords with super() method, dynamic method dispatch.	1
	3. Use of abstract classes & methods, interfaces.	1
	4. Creation of packages, importing packages, member access for packages.	1
5	**Exception handling & Multithreading**	**10L**
	1. Exception handling basics.	1
	2. Different types of exception classes, use of try & catch with throw, throws & finally, creation of user defined exception classes.	3
	3. Basics of multithreading, main thread, thread life cycle, creation of multiple threads, thread priorities.	3
	4. Thread synchronization, inter-thread communication, deadlocks for threads, suspending & resuming threads.	3
6	**Applet Programming (using swing)**	**7L**
	1. Basics of applet programming, applet life cycle, difference between application & applet programming	1
	2. Parameter passing in applets, I/O in applets, use of repaint(), getDocumentBase(), getCodeBase() methods.	1
	3. Concept of delegation event model and listener, layout manager (basic concept), creation of buttons (JButton class only) & text fields.	5

Faculty In-Charge   HOD, CSE Dept.

Assignment:
Module-1(Introduction):
  1. Explain different properties of object oriented programming language.

Module-2 (Object oriented concepts):
  1. Advantages and disadvantages of java over C and C++.
  2. Explain with examples: encapsulation, polymorphism.

Module-3(Class & Object proprieties):

Lecture-wise Plan

1. Explain different steps of java source code compilation and execution.
2. Why java is called platform independent programming language.
3. Explain with examples different access specifiers of java.
4. Explain finalize and garbage collection of java.
5. Explain the significant of static keyword.
6. String vs StringBuffer class.

Module-4(Reusability properties):
1. Explain different inheritance with examples.
2. Explain uses of this, this(), super, super().
3. Abstract class vs interface.
4. Member access for packages.

Module-5(Exception handling & Multithreading):
1. Different ways of exception handling.
2. Different ways of implementing concept of multithreading.
3. Discus problems in multithreading and their solutions.

Module-3(Applet Programming (using swing)):
1. Benefits of applet.
2. Different programs with applet.
3. Different components of swing.
4. Different event handling and layouts in swing.

UNIVERSITY OF ENGINEERING & MANAGEMENT, JAIPUR

Lecture-wise Plan

Subject Name: Compiler Design

Subject Code- **MCA504A**

Year: 3rd Year

Semester: Fifth

Module Number	Course Details	Number of Lectures
UNIT 1 **1**	**Introduction to Compiler:** • Compiler Construction tools • Analysis of the source program • The Phases of a Compiler • Cousins of the Compiler • Grouping of phases – Front and back ends, passes • Introduction, Types of translators	**4LH**
2	**Lexical Analysis:** • Role of Lexical Analyzer • Token, Patterns and Lexemes • Input buffering – buffer pairs and sentinels	**6LH**
UNIT 2 **3**	**Syntax Analysis:** • The role of a parser • Context free grammars, Writing a grammar • Top down Parsing • Non-recursive Predictive parsing (LL), Bottom up parsing, Handles • Viable prefixes • Operator precedence parsing • LR parsers (SLR, LALR), Parser generators (YACC) • Error Recovery strategies for different parsing techniques.	**7LH**
4	**Syntax directed translation:** • Syntax directed definitions • Construction of syntax trees • Bottom-up evaluation of S attributed definitions • L attributed definitions • Bottom-up evaluation of inherited attributes.	**7LH**
UNIT 3 **5**	**Type checking:** • Type systems • Specification of a simple type checker • Equivalence of type expressions • Type conversions	**7LH**
	Run time environments:	

6	• Source language issues (Activation trees, Control stack, scope of declaration, Binding of names) • Storage organization (Subdivision of run-time memory, Activation records) • Storage allocation strategies • Parameter passing (call by value, call by reference, copy restore, call by name) • Symbol tables • Dynamic storage allocation techniques.	5LH
UNIT 4 7	**Intermediate code generation:** • Intermediate languages • Graphical representation • Three-address code • Implementation of three address statements (Quadruples, Triples, Indirect triples).	8LH
8	**Code optimization and Code generations:** • Introduction • Basic blocks & flow graphs • Transformation of basic blocks • Dag representation of basic blocks, • The principle sources of optimization • Loops in flow graph • Peephole optimization • Code generations • Issues in the design of code generator, a simple code generator • Register allocation & assignment.	
	Total Number Of Hours = 44	

Faculty In-Charge   HOD, CSE Dept.

Assignment:
Module-1(Introduction):
1. Find all strings in the language (a+b)*b(a+ab)* of length less than 4.
2. With the help of a block diagram, show each phase of compiler including symbol table and error handling of a compiler.
3. Give the NFA for the following Regular Expression. Then find a DFA for the same language.
    (a|b)*abb

Module-3 (Syntax Analysis):
1. Construct the Predictive Parsing table for the following grammar:

    E -> E+ T|T

$$T \rightarrow T* F | F$$

$$F \rightarrow (E) | id$$

2. Parse the following string by operator precedence parsing:

    Id1+id2*id3

3. What are the main contributions of syntax directed translation in compiler? Design a dependency graph and direct acyclic graph for the string
    a+a*(b-c)+(b-c)*d

4. What is operator precedence parsing? Discuss about the advantage and disadvantage of operator precedence parsing.consider the following grammar:
    E-> TA
    A-> +TA|€
    T-> FB
    B-> *FB|€
    F-> id

    Test whether this grammar is operator precedence grammar or not and show how the string w=id+id*id+id will be processed by this grammar.

UNIVERSITY OF ENGINEERING & MANAGEMENT, JAIPUR

Lecture-wise Plan

Subject Name: E-Commerce **Subject Code-MCA504B**
Year:3ʳᵈ Year **Semester: Fifth**

Module Number	Topics	Number of Lectures
1	**Introduction:**	**6L**
	1. Definition, Scope of E-Commerce, Hardware requirements.	2
	2. E-Commerce and Trade Cycle	1
	3. Electronic Markets	1
	4. Electronic Data Interchange and Internet Commerce	2
2	**Business to Business E-Commerce :**	**7L**
	1. Electronic Markets, Electronic Data Interchange (EDI): Technology, Standards (UN/EDIFACT),Communications, Implementations, Agreements, Security,	3
	2. 2. EDI and Business	2
	3. Inter-Organizational E-commerce.	2
3.	**Legal issues :**	**5L**
	1. Risks: Paper Document vs. Electronic document, Authentication of Electronic document, Laws.	2
	2. Legal issues for Internet Commerce : Trade marks and Domain names, Copyright, Jurisdiction issues, Service provider liability, Enforceable online contract.	3
4	**Security Issues :**	**6L**
	1. Security Solutions : Symmetric and Asymmetric Cryptosystems, RSA,DES ,and Digital Signature.	3
	2. Protocols for secure messaging	1
	3. Secure Electronic Transaction(SET) Protocol	1
	4. Electronic cash over internet, Internet Security.	1
5	**Business to Consumer E-Commerce :**	**8L**
	1. Consumer trade transaction.	2
	2. Internet	1
	3. Page on the Web.	1
	4. Elements of E-Commerce with VB,ASP	2
	5. SQL	2
6	**E-business :**	**7L**
	1. Internet book shops, Software supplies and support, Electronic Newspapers, Internet Banking.	2

	2. Virtual Auctions, Online Share Dealing, Gambling on the net	2
	3. E-Diversity	2
	4. Case studies through internet.	1
Total Number Of Hours = 39		

Faculty In-Charge   HOD, CSE Dept.

Assignment:

1. What is E-Commerce?
2. Short Notes: EDI, RSA,DES and Digital Signature.
3. Definition of B2B, B2C, C2B, C2C.

UNIVERSITY OF ENGINEERING & MANAGEMENT, JAIPUR

Lecture-wise Plan

Subject Name: Values and Ethics in Profession   **Subject Code-HU501**
Year: 3ʳᵈ Year   **Semester: Fifth**

Module Number	Topics	Number of Lectures
	Introduction:	**19L**
1	Rapid Technological growth and depletion of resources, Reports of the Club of Rome. Limits of growth: Sustainable development	3
	Energy Crisis: Renewable Energy Resources Environmental degradation and pollution. Eco-friendly Technologies. Environmental Regulations, Environmental Ethics	5
	Appropriate Technology Movement of Schumacher; later developments Technology and developing notions. Problems of Technology transfer, Technology assessment impact analysis.	6
	Human Operator in Engineering projects and industries. Problems of man, machine, interaction, Impact of assembly line and automation. Human centered Technology.	5
2	**Ethics of Profession:**	**9L**
	Engineering profession: Ethical issues in Engineering practice, Conflicts between business demands and professional ideals.	3
	Social and ethical responsibilities of Technologists. Codes of professional ethics. Whistle blowing and beyond.	6
	Profession and Human Values	**8L**
3.	Values Crisis in contemporary society Nature of values: Value Spectrum of a good life	3
	Psychological values: Integrated personality; mental health Societal values: The modern search for a good society, justice, democracy, secularism, rule of law, values in Indian Constitution. Aesthetic values: Perception and enjoyment of beauty, simplicity, clarity Moral and ethical values: Nature of moral judgements; canons of ethics; ethics of virtue; ethics of duty; ethics of responsibility.	5

UNIVERSITY OF ENGINEERING & MANAGEMENT, JAIPUR
Lab Manual

Title of Course: System Administration and Linux Lab
Course Code: MCA592A
L-T-P scheme: 0-0-3   **Course Credit: 2**

Objectives:
This course introduces basic understanding of UNIX OS, UNIX commands and File system and to familiarize students with the Linux environment. To make student learn fundamentals of shell scripting and shell programming. Emphases are on making student familiar with UNIX environment and issues related to it..

Learning Outcomes:
 Upon completion of this course, the student will be able to:
1. You will be able to run various UNIX commands on a standard UNIX/LINUX Operating system (We will be using Ubuntu flavor of the Linux operating system).
2. You will be able to run C / C++ programs on UNIX.
3. You will be able to do shell programming on UNIX OS.
4. You will be able to understand and handle UNIX system calls.

Course Contents:
Exercises that must be done in this course are listed below:
Exercise No.1: Installation of Unix/Linux operating system.
Exercise No. 2: Write a C program to emulate the UNIX ls-l command.
Exercise No. 3: Write a C program to check the given integer is prime or not.
Exercise No. 4: Write a C program to display Largest of three numbers.
Exercise No. 5: Write a shell script program to display list of user currently logged in.
Exercise No. 6: Write a shell script program to display HELLO WORLD
Exercise No. 7: Write a shell script program to develop a scientific calculator
Exercise No. 8: Write a grep/egrep script to find the number of words character, words and lines in a file.
Exercise No. 9: Shell programming.
Exercise No. 10: Write a shell script program to display the process attributes.
Exercise No. 11: Write a shell script program to check variable attributes of file and processes.
Exercise No. 12: Installation of VirtualBox (VMWare) on a PC having other operating system.
Exercise No. 13: Shell Script program for changing process priority.

Text Book:
1. Maurice J. Bach, Design of the UNIX Operating System, PHI.

Recommended Systems/Software Requirements:
1. Intel based desktop PC with minimum of 166 MHZ or faster processor with at least 64 MB RAM and 100 MB free disk space.
2. Turbo C or TC3 complier in Windows XP or Linux Operating System.

Experiment No: 2

AIM:

Write a C program to emulate the Unix ls-l command.

Program:

```c
#include <stdio.h>
#include <unistd.h>
#include <sys/types.h>
#include <sys/wait.h>
#include <stdlib.h>
int main()
{
int pid;            //process id
pid = fork();      //create another process
if ( pid < 0 )
{                                  //fail
printf("\nFork failed\n");
exit (-1);
}
else if ( pid == 0 )
{                       //child
execlp ( "/bin/ls", "ls", "-l", NULL );  //execute ls
}
else
{                                //parent
wait (NULL);              //wait for child
printf("\nchild complete\n");
exit (0);
}
}
```

Output:

guest-glcbIs@ubuntu:~$gcc –o lsc.out lsc.c

guest-glcbIs@ubuntu:~$./lsc.out

total 100

-rwxrwx—x 1 guest-glcbls guest-glcbls 140 2012-07-06 14:55 f1

drwxrwxr-x 4 guest-glcbls guest-glcbls 140 2012-07-06 14:40 dir1

child complete

UNIVERSITY OF ENGINEERING & MANAGEMENT, JAIPUR
Lab Manual

Title of Course: Windows Programming with VB Lab
Course Code: MCA592B
L-T-P scheme: 0-0-3   **Course Credit: 2**

Objectives:
- Students will learn to evaluate engineering problems, formulate one or more solution techniques or algorithms, and code the solution using Microsoft Visual Basic for Applications (VBA) software and connect database with Microsoft Access.
- Professionalism in completing and presenting laboratory exercises is emphasized.

Learning Outcomes: Student learns about Visual Basic's Integrated Development Environment (IDE).
- Student write Visual Basic programs using object-oriented programming techniques including classes, objects, methods, instance variables, composition, and inheritance, and polymorphism.
- Understand windows applications using forms, controls, and events.
- Understand design, create, build, and debug Visual Basic applications.
- Understand database design, connectivity with backend tool.
- Create one and two dimensional arrays for sorting, calculating, and displaying of data.
- Write and apply procedures, sub-procedures, and functions to create manageable code.
- Write and apply decision structures for determining different operations.
- Analyze a given problem and implement an algorithm to solve the problem.
- Improve upon a solution to a problem.
- Implement the Visual Basic language constructs in the right way.
- Design, develop and test Applications written in Visual Basic.

Course Contents:
List of Experiments:
Exercises that must be done in this course are listed below:
1. Introduction to Visual Basic & difference with BASIC. Concept about form Project, Application, Tools, Toolbox,
i. Controls & Properties. Idea about Labels, Buttons, Text Boxes.
ii. Data basics, Different type variables & their use in VB,
iii. Sub-functions & Procedure details, Input box () & Msgbox ().
iv. Making decisions, looping
v. List boxes & Data lists, List Box control, Combo Boxes, data Arrays.
vi. Frames, buttons, check boxes, timer control,
vii. Programming with data, ODBC data base connectivity.
viii. Data forms Wizard, query, and menus in VB Applications,
ix. Graphics.

Minor project:
2. Case studies using any of the following items including relevant form design with the help of visual programming aids.
a) Payroll accounting system.
b) Library circulation management system.
c) Inventory control system.
d) University examination & grading system.
e) Patient information system.
f) Tourist information system.
g) Judiciary information system.
h) Flight reservation system.
i) Bookshop automation software.

Text Book:
1. Greg Perry, Snajaya Hettihewa, "SAMS Teach Yourself Visual Basic 6 in 24 Hours", Pearson Education.
2. Tim Anderson, "Visual Basic 6 in Easy Steps", Dreamtech Press.

Recommended Systems/Software Requirements:
1. Intel based desktop PC with minimum of 166 MHZ or faster processor with at least 64 MB RAM and 100 MB free disk space.
2. Turbo C or TC3 complier in Windows XP or Linux Operating System.

Experiment No: 1 (Forms)
Aim: Creation of basic forms with VB tools like text box, command button.

Description:
1. If cost price and selling price of an item is input through the keyboard, write a program to determine whether the seller has made profit or incurred loss. Also determine how much profit he made or loss incurred.
2. A number is input through the keyboard. Write a program to find out whether it is odd or even, +ve or –ve.
3. Write a program to check whether a year is leap or not.
4. Any character is entered through the keyboard. Write a program to determine whether the character entered is a capital letter, a small case letter, a digit or a special symbol. The following table shows the ranges of ASCII values for various characters. Characters ASCII values A – Z 65 – 90 a – z 97 – 122 0 – 9 48 – 57 Special symbols 0 – 47, 58 – 64, 91 – 96, 123 - 127
5. Calculate the median of the 3 numbers.
6. Write a program to generate the factorial of a given integer.
7. Write a program to generate a Fibonacci series up to nth term.
8. Write a program to generate all the Armstrong numbers.
9. Write a program to print all prime numbers between a given ranges.
10. Calculate the roots of the quadratic equation of the form: $ax^2 + bx + c$.
11. A certain grade of steel is graded according to the following conditions:
• Hardness must be greater than 50
• Carbon content must be less than 0.7
• Tensile strength must be greater than 5600. The grades are as follows:
• Grade is 10 if all three conditions are met.
• Grade is 9 if conditions (i) and (ii) are met.
• Grade is 8 if conditions (ii) and (iii) are met.
• Grade is 7 if conditions (i) and (iii) are met.
• Grade is 6 if one condition is met.
• Grade is 5 if none of the conditions are met.

Write a program, which will require the user to give values of hardness, carbon content and tensile strength of the steel under consideration and output the grade of the steel

Experiment No: 2

Description:

1. Create a form with a command button named as: - "CAPTION1". Write a program to change this caption as: - "CLICK ME" with bold font.

2. Write a program to demonstrate the idea of the message box function. Also describe the various attributes of message box function with suitable code snippet.

3. Write a program to demonstrate the idea of the input box function. Input a character through input box function and determine whether it is vowel, consonant or special character.

4. Write a program to show the implementation of the timer control in a form. Create a VB form with a splash screen. The screen will be displayed before the vb forms. The duration of display is 5 milliseconds.

5. Write a program to demonstrate the concept of the image box and the picture box. Display an image with image box and picture box both. Determine the difference between these two.

6. Write a program to demonstrate the idea of the checkbox control. Input some string with a text box. Put three check boxes captioned as: - a. block letter, b. small letter, c. normal case. On the form. The string case will be changed after clicking the appropriate checkbox.

7. Write a program to demonstrate the concept of the option button control. Input some string with a text box. Put two check boxes captioned as: - a. bold font, b. normal font. On the form. The string font will be changed either in bold or in normal after clicking the option button.

8. Create a combo box with 3 values. These values are input through an input box function. Delete the first element of the combo box.

9. Write a program to demonstrate the idea of the list box. Create a list with the followings: - a. GOOD MORNING. b. GOOD AFTERNOON. c. GOOD NIGHT. When you will click the each item of this list box, the appropriate picture will be displayed on a form.

10. Draw a rectangle shape with shape tool. Create 6 option buttons as follows: -

o RECTANGLE.
o SQUARE.
o OVAL.
o CIRCLE.
o ROUNDED SQURE.
o ROUNDED RECTANGLE.

Write a program to change the shape after clicking each option button. For every shapes, the fill color,
Border color, fill style must be changed.
Draw a line with line tool. Change the position of the line, border color, border width visibility style of that line with suitable code

Experiment No: 3

Aim: creation of basic forms with vb controls

Description:

1. Create a form with a progress bar. When the progress bar will be completed the second form will be opened and the 1st form will be hidden. In the new form, an image will be displayed.

2. Implement the drive list box, dir list box and file list box control in a VB form. For every change in the name of the drives, the name of the directories must be changed. And by selecting every directory, the list of files must be viewed in the file list box. When you click on the each and every file in the file list box, the file name will be displayed through a message box with the information style. Write this program with suitable VB code snippet.

3. Create a vb menu. The menu will contain two main menus: - FILE AND HELP. Under the FILE menu these will be situated: - NEW, OPEN, SAVE, SAVE AS, PRINT, EXIT. Under the HELP menu there will be a sub menu named as ABOUT US. Every option must have a short cut key with a suitable letter. Every submenu must be clickable. When you click the NEW, a new form will be created with a label: - "THIS IS NEW FORM". When you click OPEN, a dialog box will be opened and select an image file from that dialog box and display that image in a picture box on your default form. When you will click the SAVE & SAVE AS, suitable message box will be opened. When you will click the PRINT option, you will be able to change the background color of a form with a system palette. After clicking EXIT, the application will be closed. After clicking on ABOUT US a message box will be displayed with your details in a new line.

4. Create multiple document interfaces with VB.

5. Create a signaling system with TIMER.

6. Display the SINGLE LINE INPUT of a file with a suitable VB application.

7. Display all records of a file with a VB application.

8. Insert a record in a file. After the insert, the file will contain only the new record.

9. Insert some in a file. The new records are inserted after some previous data.

10. Create a vb form. The form will contain three text boxes captioned with NAME, DEPARTMENT, ROLL, and MOBILE NO. Insert the desired value to every text boxes and select the desired file where you will save these values.

UNIVERSITY OF ENGINEERING & MANAGEMENT, JAIPUR
Course Description

Title of Course: Major Project　　　　　　　**Course Code: MCA591**
L-T –P Scheme: 0-0-12　　　　　　　　　　**Course Credits: 9**

Project: an activity where the participants have some degree of *choice* in the outcome. The result is complete and functional, that is, it has a beginning, middle and end. Usually, it spans multiple lab periods and requires work outside scheduled lab periods. Since there are choices in implementation, *design* is inherently a component of a project. A project is inherently different from an *analysis* or *exercise*, in which the solution has a predictable form. Projects span a wide variety of possibilities: design and build, identify a system, do a forensic analysis, evaluate a product or assess some environmental situation.

Program Objective 1
Graduates shall make their way to the society with proper scientific and technical knowledge in mechanical engineering.

Program Objective 2
Graduates shall work in design and analysis of mechanical systems with strong fundamentals and methods of synthesis.

Program Objective 3
Graduates shall adapt to the rapidly changing environment in the areas of mechanical engineering and scale new heights in their profession through lifelong learning.

Program Objective 4
Graduates shall excel in career by their ability to work and communicate effectively as a team member and/or leader to complete the task with minimal resources, meeting deadlines.

Program Outcomes:

1. Ability to apply knowledge of mathematics, science and mechanical engineering fundamentals for solving problems.
2. Ability to Identify, formulate and analyze mechanical engineering problems arriving at meaningful conclusions involving mathematical inferences.
3. Ability to design and develop mechanical components and processes to meet desired needs considering public health, safety, cultural, social, and environmental aspects.
4. Ability to understand and investigate complex mechanical engineering problems experimentally.
5. Ability to apply modern engineering tools, techniques and resources to solve complex mechanical engineering activities with an understanding of the limitations.
6. Ability to understand the effect of mechanical engineering solutions on legal, cultural, social, public health and safety aspects./li>

7. Ability to develop sustainable solutions and understand their impact on society and environment.
8. Ability to apply ethical principles to engineering practices and professional responsibilities.
9. Ability to function effectively as an individual and as a member or leader in diverse teams and in multidisciplinary settings.
10. Ability to comprehend, design documentation, write effective reports, make effective presentations to the engineering community and society at large.
11. Ability to apply knowledge of engineering and management principles to lead teams and manage projects in multidisciplinary environments.
12. Ability to engage in independent and life-long learning in the broad context of technological changes and advancements.