MALINENI LAKSHMAIAH
WOMEN'S ENGINEERING COLLEGE
(AUTONOMOUS)

(Accredited by "NBA" & NACC A+ Grade | Approved by AICTE, New Delhi & Affiliated to JNTUK, Kakinada)
Pulladigunta (Vil), Vatticherukuru (Md), Prathipadu Road, Guntur – 522 017 A.P.

Department of **Computer Science & Engineering**

Date: 2/07/2024.

Minutes Of Meeting

The Minutes of Meeting for B.Tech & M.Tech CSE Program is conducted on 2-07-2024 at 3:00PM in HOD's Chamber through Zoom platform.

Link: https://us06web.zoom.us/j/88538597344?pwd=d5uDkdDppCTaN2qer9YWf2WbY9nBC7.1

The Following members have attended the meeting:

S.No	Name & Designation	Members	Signature
1	Dr.G.Rama Swamy, Professor & HOD of CSE	Chairman	
2	**Dr.** D.Haritha , Professor of CSE, UCEK, JNTUK	University Nominee	
3	Dr.K.Gangadhara Rao Professor & HOD of CSE ANU, Guntur.	Subject expert from outside the parent University	
4	Dr. J. Chandra Sekhar HOD, Professor CSE, NRIIT	Subject expert from outside the parent University	
5	Mr. K.Srinivasa Ramanujam Head - Workforce Management Cyber Security Business at TCS, Bangalore	Industry Nominee	
6	Ms. T.Yamini Koteswari	Student Nominee	
7	Dr K.Siva Krishna Assoc.Prof	Faculty member	
8	Mr.K.Praven Kumar, Assist.Prof	Faculty member	
9	Ms. K.M.L.Priyanka, Assist.Prof	Faculty member	
10	Ms.M.Bharathi Rani, Assist.Prof	Faculty member	
11	Mr.A.Rama Krishna, Assist.Prof	Faculty member	
12	Ms.K.Akhila, Assist.Prof	Faculty member	
13	Ms. Y.Saraswathi, Assist.Prof	Faculty member	

In the beginning of the meeting the Chairman of the Committee, **Dr.G.Rama Swamy** welcomed all the Internal BoS members and external members and briefed about the course Structure and Course Syllabus designed by JNTUK Regulation-23 (R-23) for Computer Science & Engineering and Computer courses offering to other branches for II B.Tech, and II M.Tech Programs.

Meeting Agenda:

Item No: 1

Discussion on Proposed Course Structure of 2nd B.Tech and 2nd M.Tech, Ratification of the same

Item No: 2

Discussion on Proposed Syllabus of Courses Offered by Department and other Department Computer courses in 2nd B.Tech and 2nd M.Tech.

Resolutions:

Item No: 1

Discussion on Proposed Course Structure of 2nd B.Tech Semester-I & Semester-II, 2nd M.Tech Semester-I & Semester-II and Ratifications of the same.

The Department of CSE's proposed course structure for the B.Tech & M.Tech programs is presented to the BOS members, who are asked to approve it after making any necessary changes, and all of the members approved of it.

II-B.Tech - I Semester (Common for CSE)

S.No.	Category	Title	L	T	P	Credits
1	BS&H	Discrete Mathematics & Graph Theory	3	0	0	3
2	BS&H	Universal Human Values–Understanding Harmony	2	1	0	3
3	**Engineering Science**	**Digital Logic & Computer Organization**	**3**	**0**	**0**	**3**
4	**Professional Core**	**Advanced Data Structures & Algorithm Analysis**	**3**	**0**	**0**	**3**
5	**Professional Core**	**Object Oriented Programming Through Java**	**3**	**0**	**0**	**3**
6	**Professional Core**	**Advanced Data Structures and Algorithm Analysis Lab**	**0**	**0**	**3**	**1.5**

7	**Professional Core**	**Object Oriented Programming Through Java Lab**	**0**	**0**	**3**	**1.5**
8	**Skill Enhancement Course**	**Python Programming**	**0**	**1**	**2**	**2**
9	Audit Course	Environmental Science	2	0	0	-
Total			**16**	**2**	**8**	**20**

II-B.Tech - I Semester (Common for ECE)

S.No.	Category	Title	L	T	P	Credits
1	BS	Probability theory and stochastic process	3	0	0	3
2	HSMC	Universal Human Values– Understanding Harmony and Ethical Human Conduct	2	1	0	3
3	Engineering Science	Signals and Systems	3	0	0	3
4	Professional Core	Electronic Devices and Circuits	3	0	0	3
5	Professional Core	Switching Theory and Logic Design	3	0	0	3
6	Professional Core	Electronic Devices and Circuits Lab	0	0	3	1.5
7	Professional Core	Switching Theory and Logic Design Lab	0	0	3	1.5
8	**Skill Enhancement Course**	**Data Structures using Python**	**0**	**1**	**2**	**2**
9	Audit Course	Environmental Science	2	0	0	-
Total			**16**	**2**	**08**	**20**

II-B.Tech - II Semester (Common for CSE)

S.No.	Category	Title	L	T	P	Credits
1	Management Course- I	Managerial Economics and Financial Analysis	2	0	0	2
2	Engineering Science/ Basic Science	Probability & Statistics	3	0	0	3

3	Professional Core	Operating Systems	3	0	0	3
4	Professional Core	Database Management Systems	3	0	0	3
5	Professional Core	Software Engineering	2	1	0	3
6	Professional Core	Operating Systems Lab	0	0	3	1.5
7	Professional Core	Database Management Systems Lab	0	0	3	1.5
8	Skill Enhancement Course	Full Stack Development –I	0	1	2	2
9	BS&H	Design Thinking &Innovation	1	0	2	2
Total			14	2	10	21
Mandatory Community Service Project Internship of 08 weeks duration during summer vacation						

II-M.Tech - II Semester (Common for CSE)

S.No	Course Code	Courses	Category	L	T	P	C
1	MTCSE2101	**ProgramElective-5** 1. Deep Learning 2. Social Network Analysis 3. MOOCs-1(NPTEL/SWAYAM)12 Week Program related to the Programme which is not listed in the course structure	PE	3	0	0	3
2	MTCSE2102	**Open Elective** 1. MOOCs-2 (NPTEL/SWAYAM)-Any 12 Week Course on Engineering/ Management/ Mathematics offered by other than parent department 2. Course offered by other departments in the college	OE	3	0	0	3
3	MTCSE2103	**Dissertation-I/Industrial Project#**	PJ	0	0	20	10
Total Credits							16

II-M.Tech - II Semester (Common for CSE)

M.Tech.(CSE) IV SEMESTER							
S.No	Course Code	Courses	Category	L	T	P	C
1	MTCSE2201	**Dissertation-II**	PJ	0	0	32	16
		Total Credits					16

The Course Structure of **2nd B.Tech I-Semester & II-Semester and 2nd M.Tech I-Semester & II-Semester**, have been discussed in the meeting and the BOS Members are requested for any changes in the courses offered by the Department of CSE. All of the BOS members approved of it.

Item No 2:

Discussion on Proposed Syllabus of Courses Offered by Department and other department computer cpourses in 2nd B.Tech I-Semester & II-Semester, 2nd M.Tech I-Semester & II-Semester and Ratifications of the same.

The chairman gave a presentation regarding the proposed Syllabi. Topics from II. B.Tech I semester and II semester were discussed and Also covered the II.M.Tech I semester and II semester syllabi.

Suggestions on course syllabus by the BoS Members:

1. **Dr.D.Haritha**, University Nominee suggested on the concept "introduction to Algorithms Analysis" to be updated as "Algorithms Analysis" in UNIT-I in the Course "**Advanced Data Structures & Algorithm Analysis**" of 2nd Year 1st Semester.
2. The Subject Expert, **Dr.K.Gangadhara Rao**, suggested that add a UNIX text book name as 'Unix for programmers and users a complete Guide by Graham Glass in the Operating Systems Lab.
3. Industry nominee, **Mr. K. Srinivasa Ramanujam** as advised to develop an application in the course Full stack Development-I Lab in Lab cycle.
4. One of external subject experts named **Dr .J. Chandra Sekhar** suggested adds a text name as "Software Engineering by KK Aagarwal in the reference books list in the course Software Engineering.
5. The internal subject expert named **Ms R.Akhila** suggested on 'Agility' concepts are kept at from Unit III to Unit-II and COCOMO, Risk Management are kept from unit-III to Unit-V in the Course "Software Engineering"
6. The Student Nominee named **Ms T.Yamini Koteswari** suggested on the Course Database Management Systems is Entity Relationship Model concepts are kept from unit-I to Unit-II.

7. The internal subject expert named **Ms G Sri Lakshmi** suggested on the Course of Database Management Systems is kept BASIC SQL concepts from unit-II to Unit-III.
8. The Course of Environmental Science syllabi ratified same syllabi of JNTUK. All of the BOS members approved of it.
9. All the members recommended sticking to the M.Tech-CSE proposed curriculum without making any adjustments.

The updated course syllabus is included, taking into account the recommendation made by BOS members.

Finally, the Chairperson of the BOS thanked all the members for their valuable inputs and active participation in the meeting.

Chairperson
BOS-CSE, MLEW.

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

COURSE SYLLABUS –B.TECH (CSE) - MR23

(Applicable from the 2023-24 admitted batches)

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

COURSE STRUCTURE–B.TECH (CSE) - MR23

(Applicable from the 2023-24 admitted batches)

B.Tech.– II Year I Semester

S.No.	Category	Course code	Title	L	T	P	Credits
1	BS&H	23BS21T01	Discrete Mathematics & Graph Theory	3	0	0	3
2	BS&H	23HM21T01	Universal Human Values–Understanding Harmony	2	1	0	3
3	ES	23ES21T01	Digital Logic & Computer Organization	3	0	0	3
4	PC	23CS21T01	Advanced Data Structures & Algorithm Analysis	3	0	0	3
5	PC	23CS21T02	Object Oriented Programming Through Java	3	0	0	3
6	PC	23CS21L01	Advanced Data Structures and Algorithm Analysis Lab	0	0	3	1.5
7	PC	23CS21L02	Object Oriented Programming Through Java Lab	0	0	3	1.5
8	SEC	23CS21S01	Python Programming	0	1	2	2
9	AC	23BS21T01	Environmental Science	2	0	0	-
		Total		**16**	**2**	**8**	**20**

1.

2.

3. K. Gangaram

4. J CSE ICH

5.

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COURSE STRUCTURE–B.TECH (CSE) - MR23

(Applicable from the 2023-24 admitted batches)

B.Tech.– II Year II Semester

S.No.	Category	Course code	Title	L	T	P	Credits
1	MC-I	23HM22T01	Managerial Economics and Financial Analysis	2	0	0	2
2	ES / BS	23BS22T01	Probability & Statistics	3	0	0	3
3	PC	23CS22T01	Operating Systems	3	0	0	3
4	PC	23CS22T02	Database Management Systems	3	0	0	3
5	PC	23CS22T03	Software Engineering	2	1	0	3
6	PC	23CS22L01	Operating Systems Lab	0	0	3	1.5
7	PC	23CS22L02	Database Management Systems Lab	0	0	3	1.5
8	SEC	23CS22S01	Full Stack Development –I	0	1	2	2
9	BS&H	23BS22L01	Design Thinking &Innovation	1	0	2	2
		Total		14	2	10	21
Mandatory Community Service Project Internship of 08 weeks duration during summer vacation							

1.

2.

3. K. Gowtham

4. J C Sekhar

5.

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L	T	P	C
3	0	0	3

II Year I Semester

DIGITAL LOGIC & COMPUTER ORGANIZATION

Course Objectives:

The main objectives of the course is to

- provide students with a comprehensive understanding of digital logic design principles and computer organization fundamentals
- Describe memory hierarchy concepts
- Explain input/output (I/O) systems and their interaction with the CPU, memory, and peripheral devices

UNIT – I:

Data Representation: Binary Numbers, Fixed Point Representation. Floating Point Representation. Number base conversions, Octal and Hexadecimal Numbers, components, Signed binary numbers, Binary codes

Digital Logic Circuits-I: Basic Logic Functions, Logic gates, universal logic gates, Minimization of Logic expressions. K-Map Simplification, Combinational Circuits, Decoders, Multiplexers

UNIT – II:

Digital Logic Circuits-II: Sequential Circuits, Flip-Flops, Binary counters, Registers, Shift Registers, Ripple counters

Basic Structure of Computers: Computer Types, Functional units, Basic operational concepts, Bus structures, Software, Performance, multiprocessors and multi computers, Computer Generations, Von- Neumann Architecture

UNIT – III:

Computer Arithmetic : Addition and Subtraction of Signed Numbers, Design of Fast Adders, Multiplication of Positive Numbers, Signed-operand Multiplication, Fast Multiplication, Integer Division, Floating-Point Numbers and Operations

Processor Organization: Fundamental Concepts, Execution of a Complete Instruction, Multiple-Bus Organization, Hardwired Control and Multi programmed Control

UNIT – IV:

The Memory Organization: Basic Concepts, Semiconductor RAM Memories, Read-Only Memories, Speed, Size and Cost, Cache Memories, Performance Considerations, Virtual Memories, Memory Management Requirements, Secondary Storage

MALINENI LAKSHMAIAH WOMEN'S ENGINEERING COLLEGE

(AUTONOMOUS)

Guntur - 522 017, Andhra Pradesh.

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

UNIT – V:

Input/Output Organization: Accessing I/O Devices, Interrupts, Processor Examples, Direct Memory Access, Buses, Interface Circuits, Standard I/O Interfaces

Textbooks:

1. Computer Organization, Carl Hamacher, ZvonkoVranesic, SafwatZaky, 6th edition, McGraw Hill
2. Digital Design, 6th Edition, M. Morris Mano, Pearson Education.
3. Computer Organization and Architecture, William Stallings, 11thEdition, Pearson.

Reference Books:

1. Computer Systems Architecture, M.Moris Mano, 3rdEdition, Pearson
2. Computer Organization and Design, David A. Paterson, John L.Hennessy, Elsevier
3. Fundamentals of Logic Design, Roth, 5thEdition, Thomson

Online Learning Resources:

1. https://nptel.ac.in/courses/106/103/106103068/

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L	T	P	C
3	0	0	3

II Year I Semester

ADVANCED DATA STRUCTURES & ALGORITHM ANALYSIS

Course Objectives:

The main objectives of the course is to

- provide knowledge on advance data structures frequently used in Computer Science domain
- Develop skills in algorithm design techniques popularly used
- Understand the use of various data structures in the algorithm design

UNIT – I:

Algorithm Analysis, Space and Time Complexity analysis, Asymptotic Notations.

AVL Trees – Creation, Insertion, Deletion operations and Applications

B-Trees – Creation, Insertion, Deletion operations and Applications

UNIT – II:

Heap Trees (Priority Queues) – Min and Max Heaps, Operations and Applications

Graphs – Terminology, Representations, Basic Search and Traversals, Connected Components and Biconnected Components, applications

Divide and Conquer: The General Method, Quick Sort, Merge Sort, Strassen's matrix multiplication, Convex Hull

UNIT – III:

Greedy Method: General Method, Job Sequencing with deadlines, Knapsack Problem, Minimum cost spanning trees, Single Source Shortest Paths

Dynamic Programming: General Method, All pairs shortest paths, Single Source Shortest Paths– General Weights (Bellman Ford Algorithm), Optimal Binary Search Trees, 0/1 Knapsack, String Editing, Travelling Salesperson problem

UNIT – IV:

Backtracking: General Method, 8-Queens Problem, Sum of Subsets problem, Graph Coloring, 0/1 Knapsack Problem

Branch and Bound: The General Method, 0/1 Knapsack Problem, Travelling Salesperson problem

UNIT – V:

NP Hard and NP Complete Problems: Basic Concepts, Cook's theorem

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NP Hard Graph Problems: Clique Decision Problem (CDP), Chromatic Number Decision Problem (CNDP), Traveling Salesperson Decision Problem (TSP)

NP Hard Scheduling Problems: Scheduling Identical Processors, Job Shop Scheduling.

Textbooks:

1. Fundamentals of Data Structures in C++, Horowitz, Ellis; Sahni, Sartaj; Mehta, Dinesh, 2nd Edition Universities Press
2. Computer Algorithms in C++, Ellis Horowitz, Sartaj Sahni, SanguthevarRajasekaran, 2nd Edition University Press

Reference Books:

1. Data Structures and program design in C, Robert Kruse, Pearson Education Asia
2. An introduction to Data Structures with applications, Trembley& Sorenson, McGraw Hill
3. The Art of Computer Programming, Vol.1: Fundamental Algorithms, Donald E Knuth, Addison-Wesley, 1997.
4. Data Structures using C & C++: Langsam, Augenstein&Tanenbaum, Pearson, 1995
5. Algorithms + Data Structures & Programs:, N.Wirth, PHI
6. Fundamentals of Data Structures in C++: Horowitz Sahni& Mehta, Galgottia Pub.
7. Data structures in Java:, Thomas Standish, Pearson Education Asia

Online Learning Resources:

1. https://www.tutorialspoint.com/advanced_data_structures/index.asp
2. http://peterindia.net/Algorithms.html
3. Abdul Bari,Introduction to Algorithms (youtube.com)

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

II Year I Semester

L	T	P	C
3	0	0	3

OBJECT ORIENTED PROGRAMMING THROUGH JAVA

Course Objectives:

The learning objectives of this course are to:

- identify Java language components and how they work together in applications
- Learnthe fundamentals of object-oriented programming in Java, including defining classes, invoking methods, using class libraries.
- learn how to extend Java classes with inheritance and dynamic binding and how to use exception handling in Java applications
- understand how to design applications with threads in Java
- understand how to use Java APIs for program development

UNIT I

Object Oriented Programming: Basic concepts, Principles,

Program Structure in Java: Introduction, Writing Simple Java Programs, Elements or Tokens in Java Programs, Java Statements, Command Line Arguments, User Input to Programs, Escape Sequences Comments, Programming Style.

Data Types, Variables, and Operators :Introduction, Data Types in Java, Declaration of Variables, Data Types, Type Casting, Scope of Variable Identifier, Literal Constants, Symbolic Constants, Formatted Output with printf() Method, Static Variables and Methods, Attribute Final, **Introduction to Operators**, Precedence and Associativity of Operators, Assignment Operator (=), Basic Arithmetic Operators, Increment (++) and Decrement (- -) Operators, Ternary Operator, Relational Operators, Boolean Logical Operators, Bitwise Logical Operators.

Control Statements: Introduction, if Expression, Nested if Expressions, if–else Expressions, Ternary Operator?:, Switch Statement, Iteration Statements, while Expression, do–while Loop, for Loop, Nested for Loop, For–Each for Loop, Break Statement, Continue Statement.

UNIT II

Classes and Objects: Introduction, Class Declaration and Modifiers, Class Members, Declaration of Class Objects, Assigning One Object to Another, Access Control for Class Members, Accessing Private Members of Class, Constructor Methods for Class, Overloaded Constructor Methods, Nested Classes, Final Class and Methods, Passing Arguments by Value and by Reference, Keyword this.

Methods: Introduction, Defining Methods, Overloaded Methods, Overloaded Constructor Methods, Class Objects as Parameters in Methods, Access Control, Recursive Methods, Nesting of Methods, Overriding Methods, Attributes Final and Static.

UNIT III

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

Arrays: Introduction, Declaration and Initialization of Arrays, Storage of Array in Computer Memory, Accessing Elements of Arrays, Operations on Array Elements, Assigning Array to Another Array, Dynamic Change of Array Size, Sorting of Arrays, Search for Values in Arrays, Class Arrays, Two-dimensional Arrays, Arrays of Varying Lengths, Three-dimensional Arrays, Arrays as Vectors.

Inheritance: Introduction, Process of Inheritance, Types of Inheritances, Universal Super Class-Object Class, Inhibiting Inheritance of Class Using Final, Access Control and Inheritance, Multilevel Inheritance, Application of Keyword Super, Constructor Method and Inheritance, Method Overriding, Dynamic Method Dispatch, Abstract Classes, Interfaces and Inheritance.

Interfaces: Introduction, Declaration of Interface, Implementation of Interface, Multiple Interfaces, Nested Interfaces, Inheritance of Interfaces, Default Methods in Interfaces, Static Methods in Interface, Functional Interfaces, Annotations.

UNIT IV

Packages and Java Library: Introduction, Defining Package, Importing Packages and Classes into Programs, Path and Class Path, Access Control, Packages in Java SE, Java.lang Package and its Classes, Class Object, Enumeration, class Math, Wrapper Classes, Auto-boxing and Auto-unboxing, Java util Classes and Interfaces, Formatter Class, Random Class, Time Package, Class Instant (java.time.Instant), Formatting for Date/Time in Java, Temporal Adjusters Class, Temporal Adjusters Class.

Exception Handling: Introduction, Hierarchy of Standard Exception Classes, Keywords throws and throw, try, catch, and finally Blocks, Multiple Catch Clauses, Class Throwable, Unchecked Exceptions, Checked Exceptions.

Java I/O and File: Java I/O API, standard I/O streams, types, Byte streams, Character streams, Scanner class, Files in Java(Text Book 2)

UNIT V

String Handling in Java: Introduction, Interface Char Sequence, Class String, Methods for Extracting Characters from Strings,Comparison, Modifying, Searching; Class String Buffer.

Multithreaded Programming: Introduction, Need for Multiple Threads Multithreaded Programming for Multi-core Processor, Thread Class, Main Thread-Creation of New Threads, Thread States, Thread Priority-Synchronization, Deadlock and Race Situations, Inter-thread Communication - Suspending, Resuming, and Stopping of Threads.

Java Database Connectivity: Introduction, JDBC Architecture, Installing MySQL and MySQL Connector/J, JDBC Environment Setup, Establishing JDBC Database Connections, ResultSet Interface

Java FX GUI: Java FX Scene Builder, Java FX App Window Structure, displaying text and image, event handling, laying out nodes in scene graph, mouse events (Text Book 3)

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

Text Books:

1) JAVA one step ahead, Anitha Seth, B.L.Juneja, Oxford.
2) Joy with JAVA, Fundamentals of Object Oriented Programming, DebasisSamanta, MonalisaSarma, Cambridge, 2023.
3) JAVA 9 for Programmers, Paul Deitel, Harvey Deitel, 4th Edition, Pearson.

References Books:

1) The complete Reference Java, 11thedition, Herbert Schildt,TMH
2) Introduction to Java programming, 7th Edition, Y Daniel Liang, Pearson

Online Resources:

1) https://nptel.ac.in/courses/106/105/106105191/
2) https://infyspringboard.onwingspan.com/web/en/app/toc/lex_auth_012880464547618816347_shared/overview

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II Year I Semester

L	T	P	C
0	0	3	1.5

ADVANCED DATA STRUCTURES & ALGORITHM ANALYSIS LAB

Course Objectives:

The objectives of the course is to

- acquire practical skills in constructing and managing Data structures
- apply the popular algorithm design methods in problem-solving scenarios

Experiments covering the Topics:

- Operations on AVL trees, B-Trees, Heap Trees
- Graph Traversals
- Sorting techniques
- Minimum cost spanning trees
- Shortest path algorithms
- 0/1 Knapsack Problem
- Travelling Salesperson problem
- Optimal Binary Search Trees
- N-Queens Problem
- Job Sequencing

Sample Programs:

1. Construct an AVL tree for a given set of elements which are stored in a file. And implement insert and delete operation on the constructed tree. Write contents of tree into a new file using in-order.
2. Construct B-Tree an order of 5 with a set of 100 random elements stored in array. Implement searching, insertion and deletion operations.
3. Construct Min and Max Heap using arrays, delete any element and display the content of the Heap.
4. Implement BFT and DFT for given graph, when graph is represented by
   a) Adjacency Matrix b) Adjacency Lists
5. Write a program for finding the biconnected components in a given graph.
6. Implement Quick sort and Merge sort and observe the execution time for various input sizes (Average, Worst and Best cases).
7. Compare the performance of Single Source Shortest Paths using Greedy method when the graph is represented by adjacency matrix and adjacency lists.
8. Implement Job Sequencing with deadlines using Greedy strategy.
9. Write a program to solve 0/1 Knapsack problem Using Dynamic Programming.
10. Implement N-Queens Problem Using Backtracking.

MALINENI LAKSHMAIAH WOMEN'S ENGINEERING COLLEGE

(AUTONOMOUS)

Guntur - 522 017, Andhra Pradesh.

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

11. Use Backtracking strategy to solve 0/1 Knapsack problem.
12. Implement Travelling Sales Person problem using Branch and Bound approach.

Reference Books:

1. Fundamentals of Data Structures in C++, Horowitz Ellis, SahniSartaj, Mehta, Dinesh, 2nd Edition, Universities Press
2. Computer Algorithms/C++ Ellis Horowitz, SartajSahni, SanguthevarRajasekaran, 2nd Edition, University Press
3. Data Structures and program design in C, Robert Kruse, Pearson Education Asia
4. An introduction to Data Structures with applications, Trembley& Sorenson, McGraw Hill

Online Learning Resources:

1. http://cse01-iiith.vlabs.ac.in/
2. http://peterindia.net/Algorithms.html

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

II Year I Semester

L	T	P	C
0	0	3	1.5

OBJECT ORIENTED PROGRAMMING THROUGH JAVA LAB

Course Objectives:

The aim of this course is to

- Practice object oriented programming in the Java programming language
- Implement Classes, Objects, Methods, Inheritance, Exception, Runtime Polymorphism, User defined Exception handling mechanism
- Illustrate inheritance, Exception handling mechanism, JDBC connectivity
- Construct Threads, Event Handling, implement packages, Java FX GUI

Experiments covering the Topics:

- Object Oriented Programming fundamentals- data types, control structures
- Classes, methods, objects, Inheritance, polymorphism,
- Exception handling, Threads, Packages, Interfaces
- Files, I/O streams, JavaFX GUI

Sample Experiments:

Exercise – 1:

a) Write a JAVA program to display default value of all primitive data type of JAVA

b) Write a java program that display the roots of a quadratic equation $ax^2+bx=0$. Calculate the discriminate D and basing on value of D, describe the nature of root.

Exercise - 2

a) Write a JAVA program to search for an element in a given list of elements using binary search mechanism.

b) Write a JAVA program to sort for an element in a given list of elements using bubble sort

c) Write a JAVA program using String Buffer to delete, remove character.

Exercise - 3

a) Write a JAVA program to implement class mechanism. Create a class, methods and invoke them inside main method.

b) Write a JAVA program implement method overloading.

c) Write a JAVA program to implement constructor.

d)Write a JAVA program to implement constructor overloading.

Exercise - 4

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Guntur - 522 017, Andhra Pradesh.

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

a) Write a JAVA program to implement Single Inheritance
b) Write a JAVA program to implement multi level Inheritance
c) Write a JAVA program for abstract class to find areas of different shapes

Exercise - 5

a) Write a JAVA program give example for "super" keyword.
b) Write a JAVA program to implement Interface. What kind of Inheritance can be achieved?
c) Write a JAVA program that implements Runtime polymorphism

Exercise - 6

a) Write a JAVA program that describes exception handling mechanism
b) Write a JAVA program Illustrating Multiple catch clauses
c) Write a JAVA program for creation of Java Built-in Exceptions
d) Write a JAVA program for creation of User Defined Exception

Exercise - 7

a) Write a JAVA program that creates threads by extending Thread class.First thread display "Good Morning "every 1 sec, the second thread displays "Hello "every 2 seconds and the third display "Welcome" every 3 seconds,(Repeat the same by implementing Runnable)
b) Write a program illustrating **is Alive** and **join ()**
c) Write a Program illustrating Daemon Threads.
d) Write a JAVA program Producer Consumer Problem

Exercise – 8

a) Write a JAVA program that import and use the user defined packages
b) Without writing any code, build a GUI that display text in label and image in an ImageView (use JavaFX)
c) Build a Tip Calculator app using several JavaFX components and learn how to respond to user interactions with the GUI

Exercise – 9

a) Write a java program that connects to a database using JDBC
b) Write a java program to connect to a database using JDBC and insert values into it.
c) Write a java program to connect to a database using JDBC and delete values from it

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(AUTONOMOUS)

Guntur - 522 017, Andhra Pradesh.

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

L	T	P	C
0	1	2	2

II Year I Semester

PYTHON PROGRAMMING (SKILL ENHANCEMENT COURSE)

Course Objectives:

The main objectives of the course are to

- Introduce core programming concepts of Python programming language.
- Demonstrate about Python data structures like Lists, Tuples, Sets and dictionaries
- Implement Functions, Modules and Regular Expressions in Python Programming and to create practical and contemporary applications using these

UNTI-I:

History of Python Programming Language, Thrust Areas of Python, Installing Anaconda Python Distribution, Installing and Using Jupyter Notebook.

Parts of Python Programming Language: Identifiers, Keywords, Statements and Expressions, Variables, Operators, Precedence and Associativity, Data Types, Indentation, Comments, Reading Input, Print Output, Type Conversions, the type () Function and Is Operator, Dynamic and Strongly Typed Language.

Control Flow Statements: if statement, if-else statement, if...elif...else, Nested if statement, while Loop, for Loop, continue and break Statements, Catching Exceptions Using try and except Statement.

Sample Experiments:

1. Write a program to find the largest element among three Numbers.
2. Write a Program to display all prime numbers within an interval
3. Write a program to swap two numbers without using a temporary variable.
4. Demonstrate the following Operators in Python with suitable examples.

i) Arithmetic Operators ii) Relational Operators iii) Assignment Operatorsiv) Logical Operators v) Bit wise Operators vi) Ternary Operator vii) Membership Operatorsviii) Identity Operators

5. Write a program to add and multiply complex numbers
6. Write a program to print multiplication table of a given number.

UNIT-II:

Functions: Built-In Functions, Commonly Used Modules, Function Definition and Calling the function, return Statement and void Function, Scope and Lifetime of Variables, Default Parameters, Keyword Arguments, *args and **kwargs, Command Line Arguments.

Strings: Creating and Storing Strings, Basic String Operations, Accessing Characters in String by Index Number, String Slicing and Joining, String Methods, Formatting Strings.

MALINENI LAKSHMAIAH WOMEN'S ENGINEERING COLLEGE

(AUTONOMOUS)

Guntur - 522 017, Andhra Pradesh.

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

Lists: Creating Lists, Basic List Operations, Indexing and Slicing in Lists, Built-In Functions Used on Lists, List Methods, del Statement.

Sample Experiments:

1. Write a program to define a function with multiple return values.
2. Write a program to define a function using default arguments.
3. Write a program to find the length of the string without using any library functions.
4. Write a program to check if the substring is present in a given string or not.
5. Write a program to perform the given operations on a list:
   i. additionii. insertioniii. slicing
6. Write a program to perform any 5 built-in functions by taking any list.

UNIT-III:

Dictionaries: Creating Dictionary, Accessing and Modifying key:value Pairs in Dictionaries, Built-In Functions Used on Dictionaries, Dictionary Methods, del Statement.

Tuples and Sets: Creating Tuples, Basic Tuple Operations, tuple() Function, Indexing and Slicing in Tuples, Built-In Functions Used on Tuples, Relation between Tuples and Lists, Relation between Tuples and Dictionaries, Using zip() Function, Sets, Set Methods, Frozenset.

Sample Experiments:

1. Write a program to create tuples (name, age, address, college) for at least two members and concatenate the tuples and print the concatenated tuples.
2. Write a program to count the number of vowels in a string (No control flow allowed).
3. Write a program to check if a given key exists in a dictionary or not.
4. Write a program to add a new key-value pair to an existing dictionary.
5. Write a program to sum all the items in a given dictionary.

UNIT-IV:

Files: Types of Files, Creating and Reading Text Data, File Methods to Read and Write Data, Reading and Writing Binary Files, Pickle Module, Reading and Writing CSV Files, Python os and os.path Modules.

Object-Oriented Programming: Classes and Objects, Creating Classes in Python, Creating Objects in Python, Constructor Method, Classes with Multiple Objects, Class Attributes Vs Data Attributes, Encapsulation, Inheritance, Polymorphism.

Sample Experiments:

1. Write a program to sort words in a file and put them in another file. The output file should have only lower-case words, so any upper-case words from source must be lowered.

MALINENI LAKSHMAIAH WOMEN'S ENGINEERING COLLEGE

(AUTONOMOUS)

Guntur - 522 017, Andhra Pradesh.

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

2. Python program to print each line of a file in reverse order.
3. Python program to compute the number of characters, words and lines in a file.
4. Write a program to create, display, append, insert and reverse the order of the items in the array.
5. Write a program to add, transpose and multiply two matrices.
6. Write a Python program to create a class that represents a shape. Include methods to calculate its area and perimeter. Implement subclasses for different shapes like circle, triangle, and square.

UNIT-V:

Introduction to Data Science: Functional Programming, JSON and XML in Python, NumPy with Python, Pandas.

Sample Experiments:

1. Python program to check whether a JSON string contains complex object or not.
2. Python Program to demonstrate NumPy arrays creation using array () function.
3. Python program to demonstrate use of ndim, shape, size, dtype.
4. Python program to demonstrate basic slicing, integer and Boolean indexing.
5. Python program to find min, max, sum, cumulative sum of array
6. Create a dictionary with at least five keys and each key represent value as a list where this list contains at least ten values and convert this dictionary as a pandas data frame and explore the data through the data frame as follows:
   a) Apply head () function to the pandas data frame
   b) Perform various data selection operations on Data Frame
7. Select any two columns from the above data frame, and observe the change in one attribute with respect to other attribute with scatter and plot operations in matplotlib

Reference Books:

1. Gowrishankar S, Veena A., Introduction to Python Programming, CRC Press.
2. Python Programming, S Sridhar, J Indumathi, V M Hariharan, 2nd Edition, Pearson, 2024
3. Introduction to Programming Using Python, Y. Daniel Liang, Pearson.

Online Learning Resources/Virtual Labs:

1. https://www.coursera.org/learn/python-for-applied-data-science-ai
2. https://www.coursera.org/learn/python?specialization=python#syllabus

MALINENI LAKSHMAIAH WOMEN'S ENGINEERING COLLEGE

(AUTONOMOUS)

Guntur - 522 017, Andhra Pradesh.

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

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2	0	0	0

II Year I Semester

ENVIRONMENTAL SCIENCE

Course Objectives:

- To make the students to get awareness on environment
- To understand the importance of protecting natural resources, ecosystems for future generations and pollution causes due to the day to day activities of human life
- To save earth from the inventions by the engineers.

Course Outcomes:

- Grasp multidisciplinary nature of environmental studies and various renewable and non-renewable resources.
- Understand flow and bio-geo-chemical cycles and ecological pyramids.
- Understand various causes of pollution and solid waste management and related preventive measures.
- About the rainwater harvesting, watershed management, ozone layer depletion and waste land reclamation.
- Casus of population explosion, value education and welfare programmes.

UNIT–I

Multidisciplinary Nature Of Environmental Studies: – Definition, Scope and Importance – Need for Public Awareness.

Natural Resources: Renewable and non-renewable resources – Natural resources and associated problems – Forest resources – Use and over – exploitation, deforestation, case studies – Timber extraction – Mining, dams and other effects on forest and tribal people – Water resources – Use and over utilization of surface and ground water – Floods, drought, conflicts over water, dams – benefits and problems–Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies– Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity,c ase studies.–Energy resources:

UNIT–II

Ecosystems: Concep to fan ecosystem.–Structure and function of an ecosystem– Producers, consumers and decomposers – Energy flow in the ecosystem – Ecological succession – Food chains, food webs and ecological pyramids–Introduction, types, characteristicfeatures, structure and function of the following ecosystem:

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(AUTONOMOUS)

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a. Forest ecosystem.
b. Grassl and ecosystem
c. Desert ecosystem
d. Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)

Biodiversity And Its Conservation: Introduction Definition: genetic, species and ecosystem diversity–Bio-geographical classification of India–Value of biodiversity: consumptive use, Productive use, social, ethical, aesthetic and option values – Biodiversity at global, National and locallevels – India as a mega-diversity nation – Hot-sports of biodiversity – Threats to biodiversity: habitat loss,poaching of wildlife, man-wildlife conflicts– Endangered and endemic species of India –Conservation of biodiversity:In-situand Ex-situ conservation of biodiversity.

UNIT–III

Environmental Pollution:Definition, Cause, effects and control measures of:

a. Air Pollution.
b. Water pollution
c. Soil pollution
d. Marine pollution
e. Noise pollution
f. Thermal pollution
g. Nuclear hazards

Solid Waste Management: Causes, effects and control measures of urban and industrial wastes – Roleof an individual in prevention of pollution – Pollution case studies – Disaster management: floods,earthquake,cycloneandlandslides.

UNIT–IV

Social Issues and the Environment: From Unsustainable to Sustainable development–Urban problems related to energy – Water conservation, rain water harvesting, watershed management –Resettlement and rehabilitation of people; its problems and concerns. Case studies – Environmental ethics: Issues and possible solutions–Climate change, global warming, acidrain, ozone layer depletion, nuclear accidents and holocaust. Case Studies – Wastel and reclamation. – Consumerism and waste products. – Environment Protection Act. – Air (Prevention and Control of Pollution) Act. –Water (Prevention and control of Pollution) Act–Wild life Protection Act–Forest Conservation Act–Issues involved inenforcement of environment allegislation–Public awareness.

UNIT–V

Human Population And The Environment: Population growth, variation among nations. Population explosion – Family Welfare Programmes. – Environment and human health –

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Human Rights – Value Education–HIV/AIDS–Women and Child Welfare–Role of information Technology in Environment and human health–Case studies. Field Work:Visit to a local area to document environmental assets River/ forest grassland/ hill/ mountain – Visit to a local polluted site-Urban/Rural/Industrial/Agricultural Study of common plants,insects, and birds–river, hills lopes,etc..

Text books:

1. Text book of Environmental Studies for Undergraduate Courses ErachBharucha for University Grants Commission, Universities Press.
2. Palaniswamy,"Environmental Studies",Pearson education
3. S.AzeemUnnisa,"Environmental Studies"Academic Publishing Company
4. K.RaghavanNambiar,"Text book of Environmental Studies for UndergraduateCourses as per UGC model syllabus", Scitech Publications (India), Pvt.Ltd.

Reference Books:

1. DeekshaDaveandE.SaiBabaReddy, "Text book of Environmental Science",Cengage Publications.
2. M.AnjiReddy,"Text book of Environmental Sciences and Technology",BSPublication.
3. J.P.Sharma,Comprehensive Environmental studies,Laxmi publications.
4. J.GlynnHenryandGaryW.Heinke,"Environmental Sciences and Engineering",Prentice Hall of India Private limited
5. G.R.Chatwal,"A Text Book of Environmental Studies"Himalaya Publishing House
6. Gilbert M.Masters and WendellP.Ela,"Introduction to Environmental Engineeringand Science,Prentice Hall of India Private limited.

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Guntur - 522 017, Andhra Pradesh.

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

L	T	P	C
3	0	0	3

II Year II Semester

OPERATING SYSTEMS

Course Objectives:

The main objectives of the course is to make student

- Understand the basic concepts and principles of operating systems, including process management, memory management, file systems, and Protection
- Make use of process scheduling algorithms and synchronization techniques to achieve better performance of a computer system.
- Illustrate different conditions for deadlock and their possible solutions.

UNIT - I

Operating Systems Overview: Introduction, Operating system functions, Operating systems operations, Computing environments, Free and Open-Source Operating Systems

System Structures: Operating System Services, User and Operating-System Interface, system calls, Types of System Calls, system programs, Operating system Design and Implementation, Operating system structure, Building and Booting an Operating System, Operating system debugging

UNIT - II

Processes: Process Concept, Process scheduling, Operations on processes, Inter-process communication.

Threads and Concurrency: Multithreading models, Thread libraries, Threading issues.

CPU Scheduling: Basic concepts, Scheduling criteria, Scheduling algorithms, Multiple processor scheduling.

UNIT – III

Synchronization Tools: The Critical Section Problem, Peterson's Solution, Mutex Locks, Semaphores, Monitors, Classic problems of Synchronization.

Deadlocks: system Model, Deadlock characterization, Methods for handling Deadlocks, Deadlock prevention, Deadlock avoidance, Deadlock detection, Recovery from Deadlock.

UNIT - IV

Memory-Management Strategies: Introduction, Contiguous memory allocation, Paging, Structure of the Page Table, Swapping.

Virtual Memory Management: Introduction, Demand paging, Copy-on-write, Page replacement, Allocation of frames, Thrashing

Storage Management: Overview of Mass Storage Structure, HDD Scheduling.

MALINENI LAKSHMAIAH WOMEN'S ENGINEERING COLLEGE

(AUTONOMOUS)

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UNIT - V

File System: File System Interface: File concept, Access methods, Directory Structure; File system Implementation: File-system structure, File-system Operations, Directory implementation, Allocation method, Free space management; File-System Internals: File-System Mounting, Partitions and Mounting, File Sharing. Protection: Goals of protection, Principles of protection, Protection Rings, Domain of protection, Access matrix.

Text Books:

1. Operating System Concepts, Silberschatz A, Galvin P B, Gagne G, 10th Edition, Wiley, 2018.
2. Modern Operating Systems, Tanenbaum A S, 4th Edition, Pearson , 2016

Reference Books:

1. Operating Systems -Internals and Design Principles, Stallings W, 9th edition, Pearson, 2018
2. Operating Systems: A Concept Based Approach, D.M Dhamdhere, 3rd Edition, McGraw- Hill, 2013

Online Learning Resources:

1. https://nptel.ac.in/courses/106/106/106106144/
2. http://peterindia.net/OperatingSystems.html

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

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II Year II Semester

DATABASE MANAGEMENT SYSTEMS

Course Objectives:

The main objectives of the course is to

- Introduce database management systems and to give a good formal foundation on the relational model of data and usage of Relational Algebra
- Introduce the concepts of basic SQL as a universal Database language
- Demonstrate the principles behind systematic database design approaches by covering conceptual design, logical design through normalization
- Provide an overview of physical design of a database system, by discussing Database indexing techniques and storage techniques

UNIT I:

Introduction: Database system, Characteristics (Database Vs File System), Database Users, Advantages of Database systems, Database applications. Brief introduction of different Data Models; Concepts of Schema, Instance and data independence; Three tier schema architecture for data independence; Database system structure, environment, Centralized and Client Server architecture for the database.

UNIT II:

Entity Relationship Model: Introduction, Representation of entities, attributes, entity set, relationship, relationship set, constraints, sub classes, super class, inheritance, specialization, generalization using ER Diagrams.

Relational Model: Introduction to relational model, concepts of domain, attribute, tuple, relation, importance of null values, constraints (Domain, Key constraints, integrity constraints) and their importance, Relational Algebra, Relational Calculus.

UNIT III:

BASIC SQL: Simple Database schema, data types, table definitions (create, alter), different DML operations (insert, delete, update). Basic SQL querying (select and project) using where clause, arithmetic & logical operations, SQL functions(Date and Time, Numeric, String conversion).Creating tables with relationship, implementation of key and integrity constraints, nested queries, sub queries, grouping, aggregation, ordering, implementation of different types of joins, view(updatable and non-updatable), relational set operations.

UNIT IV:

Schema Refinement (Normalization):Purpose of Normalization or schema refinement, concept of functional dependency, normal forms based on functional dependency Lossless join and dependency preserving decomposition, (1NF, 2NF and 3 NF), concept of surrogate key, Boyce-Coddnormal form(BCNF), MVD, Fourth normal form(4NF), Fifth Normal Form (5NF).

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

UNIT V:

Transaction Concept: Transaction State, ACID properties, Concurrent Executions, Serializability, Recoverability, Implementation of Isolation, Testing for Serializability, lock based, time stamp based, optimistic, concurrency protocols, Deadlocks, Failure Classification, Storage, Recovery and Atomicity, Recovery algorithm.

Introduction to Indexing Techniques: B+ Trees, operations on B+Trees, Hash Based Indexing:

Text Books:

1) Database Management Systems, 3rd edition, Raghurama Krishnan, Johannes Gehrke, TMH (For Chapters 2, 3, 4)
2) Database System Concepts,5th edition, Silberschatz, Korth, Sudarsan,TMH (For Chapter 1 and Chapter 5)

Reference Books:

1) Introduction to Database Systems, 8thedition, C J Date, Pearson.
2) Database Management System, 6th edition, RamezElmasri, Shamkant B. Navathe, Pearson
3) Database Principles Fundamentals of Design Implementation and Management, Corlos Coronel, Steven Morris, Peter Robb, Cengage Learning.

Web-Resources:

1) https://nptel.ac.in/courses/106/105/106105175/
2) https://infyspringboard.onwingspan.com/web/en/app/toc/lex_auth_01275806667282022456_shared/overview

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Guntur - 522 017, Andhra Pradesh.

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

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II Year II Semester

SOFTWARE ENGINEERING

Course Objectives:

The objectives of this course are to introduce

- Software life cycle models, Software requirements and SRS document.
- Project Planning, quality control and ensuring good quality software.
- Software Testing strategies, use of CASE tools, Implementation issues, validation &verification procedures.

UNIT I:

Introduction: Evolution, Software development projects, Exploratory style of software developments, Emergence of software engineering, Notable changes in software development practices, Computer system engineering.

Software Life Cycle Models: Basic concepts, Waterfall model and its extensions, Rapid application development, Agile development model, Spiral model.

UNIT II:

Agility: Agility and the Cost of Change, Agile Process, Extreme Programming (XP), Other Agile Process Models, Tool Set for the Agile Process (Text Book 2)

Software Project Management: Software project management complexities, Responsibilities of a software project manager, Metrics for project size estimation, Project estimation techniques, Empirical Estimation techniques, Halstead's software science.

Requirements Analysis And Specification: Requirements gathering and analysis, Software Requirements Specification (SRS), Formal system specification, Axiomatic specification, Algebraic specification, Executable specification and 4GL.

UNIT III:

Software Design: Overview of the design process, How to characterize a good software design? Layered arrangement of modules, Cohesion and Coupling. approaches to software design.

Function-Oriented Software Design: Overview of SA/SD methodology, Structured analysis, Developing the DFD model of a system, Structured design, Detailed design, and Design Review.

User Interface Design: Characteristics of a good user interface, Basic concepts, Types of user interfaces, Fundamentals of component-based GUI development, and user interface design methodology.

UNIT IV:

Coding And Testing: Coding, Code review, Software documentation, Testing, Black-box testing, White-Box testing, Debugging, Program analysis tools, Integration testing, Testing object-oriented programs, Smoke testing, and Some general issues associated with testing.

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(AUTONOMOUS)

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

Software Reliability And Quality Management: Software reliability. Statistical testing, Software quality, Software quality management system, ISO 9000.SEI Capability maturity model. Few other important quality standards, and Six Sigma.

UNIT V:

Computer-Aided Software Engineering (Case): CASE and its scope, CASE environment, CASE support in the software life cycle, other characteristics of CASE tools, Towards second generation CASE Tool, and Architecture of a CASE Environment, COCOMO, Risk Management.

Software Maintenance: Characteristics of software maintenance, Software reverse engineering, Software maintenance process models and Estimation of maintenance cost.

Software Reuse: reuse- definition, introduction, reason behind no reuse so far, Basic issues in any reuse program, A reuse approach, and Reuse at organization level.

Text Books:

1. Fundamentals of Software Engineering, Rajib Mall, 5th Edition,PHI.
2. Software Engineering A practitioner's Approach, Roger S. Pressman, 9th Edition, Mc-Graw Hill International Edition.

Reference Books:

1. Software Engineering, Ian Sommerville,10thEdition, Pearson.
2. Software Engineering; Principles and Practices, Deepak Jain, Oxford University Press.
3. Software Engineering, KK AAgarwal and Yogesh Singh 3rd Edition

e-Resources:

1) https://nptel.ac.in/courses/106/105/106105182/
2) https://infyspringboard.onwingspan.com/web/en/app/toc/lex_auth_01260589506387148827_shared/overview
3) https://infyspringboard.onwingspan.com/web/en/app/toc/lex_auth_01338269041100390473 5_shared/overview

MALINENI LAKSHMAIAH WOMEN'S ENGINEERING COLLEGE

(AUTONOMOUS)

Guntur - 522 017, Andhra Pradesh.

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

II Year II Semester

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OPERATING SYSTEMS LAB

Course Objectives:

The main objectives of the course are to

- Provide insights into system calls, file systems, semaphores,
- Develop and debug CPU Scheduling algorithms, page replacement algorithms, thread implementation
- Implement Bankers Algorithms to Avoid the Dead Lock

Experiments covering the Topics:

- UNIX fundamentals, commands & system calls
- CPU Scheduling algorithms, thread processing
- IPC, semaphores, monitors, deadlocks
- Page replacement algorithms, file allocation strategies
- Memory allocation strategies

Sample Experiments:

1. Practicing of Basic UNIX Commands.
2. Write programs using the following UNIX operating system calls
   fork, exec, getpid, exit, wait, close, stat, opendir and readdir
3. Simulate UNIX commands like cp, ls, grep, etc.,
4. Simulate the following CPU scheduling algorithms
   a) FCFS b) SJF c) Priority d) Round Robin
5. Control the number of ports opened by the operating system with
   a) Semaphore b) Monitors.
6. Write a program to illustrate concurrent execution of threads using pthreads library.
7. Write a program to solve producer-consumer problem using Semaphores.
8. Implement the following memory allocation methods for fixed partition
   a) First fit b) Worst fit c) Best fit
9. Simulate the following page replacement algorithms
   a) FIFO b) LRU c) LFU
10. Simulate Paging Technique of memory management.
11. Implement Bankers Algorithm for Dead Lock avoidance and prevention
12. Simulate the following file allocation strategies
    a) Sequential b) Indexed c) Linked
13. Download and install nachos operating system and experiment with it

MALINENI LAKSHMAIAH WOMEN'S ENGINEERING COLLEGE

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

Reference Books:

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2. Modern Operating Systems, Tanenbaum A S, 4th Edition, Pearson, 2016
3. Operating Systems -Internals and Design Principles, Stallings W, 9th edition, Pearson, 2018
4. Operating Systems: A Concept Based Approach, D.M Dhamdhere, 3rd Edition, McGraw- Hill, 2013
5. Unix for Programmers and users A Complete Guide- Graham Glass and King Ables

Online Learning Resources:

1. https://www.cse.iitb.ac.in/~mythili/os/
2. http://peterindia.net/OperatingSystems.html
3. www.cs.washington.edu/~tom/nachos

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

II Year II Semester

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DATABASE MANAGEMENT SYSTEMS LAB

Course Objectives:

This Course will enable students to

- Populate and query a database using SQL DDL/DML Commands
- Declare and enforce integrity constraints on a database
- Writing Queries using advanced concepts of SQL
- Programming PL/SQL including procedures, functions, cursors and triggers

Experiments covering the topics:

- DDL, DML, DCL commands
- Queries, nested queries, built-in functions,
- PL/SQL programming- control structures
- Procedures, Functions, Cursors, Triggers,
- Database connectivity- ODBC/JDBC

Sample Experiments:

1. Creation, altering and droping of tables and inserting rows into a table (use constraints while creating tables) examples using SELECT command.
2. Queries (along with sub Queries) using ANY, ALL, IN, EXISTS, NOTEXISTS, UNION, INTERSET, Constraints. Example:- Select the roll number and name of the student who secured fourth rank in the class.
3. Queries using Aggregate functions (COUNT, SUM, AVG, MAX and MIN), GROUP BY, HAVING and Creation and dropping of Views.
4. Queries using Conversion functions (to_char, to_number and to_date), string functions (Concatenation, lpad, rpad, ltrim, rtrim, lower, upper, initcap, length, substr and instr), date functions (Sysdate, next_day, add_months, last_day, months_between, least, greatest, trunc, round, to_char, to_date)
5.
   i. Create a simple PL/SQL program which includes declaration section, executable section and exception –Handling section (Ex. Student marks can be selected from the table and printed for those who secured first class and an exception can be raised if no records were found)
   ii. Insert data into student table and use COMMIT, ROLLBACK and SAVEPOINT in PL/SQL block.
6. Develop a program that includes the features NESTED IF, CASE and CASE expression. The program can be extended using the NULLIF and COALESCE functions.
7. Program development using WHILE LOOPS, numeric FOR LOOPS, nested loops using ERROR Handling, BUILT –IN Exceptions, USE defined Exceptions, RAISE- APPLICATION ERROR.
8. Programs development using creation of procedures, passing parameters IN and OUT of PROCEDURES.

MALINENI LAKSHMAIAH WOMEN'S ENGINEERING COLLEGE

(AUTONOMOUS)

Guntur - 522 017, Andhra Pradesh.

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

9. Program development using creation of stored functions, invoke functions in SQL Statements and write complex functions.
10. Develop programs using features parameters in a CURSOR, FOR UPDATE CURSOR, WHERE CURRENT of clause and CURSOR variables.
11. Develop Programs using BEFORE and AFTER Triggers, Row and Statement Triggers and INSTEAD OF Triggers
12. Create a table and perform the search operation on table using indexing and non-indexing techniques.
13. Write a Java program that connects to a database using JDBC
14. Write a Java program to connect to a database using JDBC and insert values into it
15. Write a Java program to connect to a database using JDBC and delete values from it

Text Books/Suggested Reading:

1. Oracle: The Complete Reference by Oracle Press
2. Nilesh Shah, "Database Systems Using Oracle", PHI, 2007
3. Rick F Vander Lans, "Introduction to SQL", Fourth Edition, Pearson Education, 2007

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

L	T	P	C
0	1	2	2

II Year II Semester

FULL STACK DEVELOPMENT – 1(SKILL ENHANCEMENT COURSE)

Course Objectives:

The main objectives of the course are to

- Make use of HTML elements and their attributes for designing static web pages
- Build a web page by applying appropriate CSS styles to HTML elements
- Experiment with JavaScript to develop dynamic web pages and validate forms

Experiments covering the Topics:

- Lists, Links and Images
- HTML Tables, Forms and Frames
- HTML 5 and Cascading Style Sheets, Types of CSS
- Selector forms
- CSS with Color, Background, Font, Text and CSS Box Model
- Applying JavaScript - internal and external, I/O, Type Conversion
- JavaScript Conditional Statements and Loops, Pre-defined and User-defined Objects
- JavaScript Functions and Events
- Node.js

Sample Experiments:

1. Lists, Links and Images

a. Write a HTML program, to explain the working of lists.
   Note: It should have an ordered list, unordered list, nested lists and ordered list in an unordered list and definition lists.
b. Write a HTML program, to explain the working of hyperlinks using <a> tag and href, target Attributes.
c. Create a HTML document that has your image and your friend's image with a specific height and width. Also when clicked on the images it should navigate to their respective profiles.
d. Write a HTML program, in such a way that, rather than placing large images on a page, the preferred technique is to use thumbnails by setting the height and width parameters to something like to 100*100 pixels. Each thumbnail image is also a link to a full sized version of the image. Create an image gallery using this technique

2. HTML Tables, Forms and Frames

a. Write a HTML program, to explain the working of tables. (use tags: <table>, <tr>, <th>, <td> and attributes: border, rowspan, colspan)
b. Write a HTML program, to explain the working of tables by preparing a timetable. (Note: Use <caption> tag to set the caption to the table & also use cell spacing, cell padding, border, rowspan, colspan etc.).
c. Write a HTML program, to explain the working of forms by designing Registration form. (Note: Include text field, password field, number field, date of birth field, checkboxes, radio buttons, list boxes using

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Guntur - 522 017, Andhra Pradesh.
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

<select>&<option> tags, <text area> and two buttons ie: submit and reset. Use tables to provide a better view).

d. Write a HTML program, to explain the working of frames, such that page is to be divided into 3 parts on either direction. (Note: first frame → image, second frame → paragraph, third frame → hyperlink. And also make sure of using "no frame" attribute such that frames to be fixed).

3. HTML 5 and Cascading Style Sheets, Types of CSS

a. Write a HTML program, that makes use of <article>, <aside>, <figure>, <figcaption>, <footer>, <header>, <main>, <nav>, <section>, , tags.
b. Write a HTML program, to embed audio and video into HTML web page.
c. Write a program to apply different types (or levels of styles or style specification formats) - inline, internal, external styles to HTML elements. (identify selector, property and value).

4. Selector forms

a. Write a program to apply different types of selector forms
   i. Simple selector (element, id, class, group, universal)
   ii. Combinator selector (descendant, child, adjacent sibling, general sibling)
   iii. Pseudo-class selector
   iv. Pseudo-element selector
   v. Attribute selector

5. CSS with Color, Background, Font, Text and CSS Box Model

a. Write a program to demonstrate the various ways you can reference a color in CSS.
b. Write a CSS rule that places a background image halfway down the page, tilting it horizontally. The image should remain in place when the user scrolls up or down.
c. Write a program using the following terms related to CSS font and text:
   i. font-size ii. font-weight iii. font-style
   iv. text-decoration v. text-transformation vi. text-alignment
d. Write a program, to explain the importance of CSS Box model using
   i. Content ii. Border iii. Margin iv. padding

6. Applying JavaScript - internal and external, I/O, Type Conversion

a. Write a program to embed internal and external JavaScript in a web page.
b. Write a program to explain the different ways for displaying output.
c. Write a program to explain the different ways for taking input.
d. Create a webpage which uses prompt dialogue box to ask a voter for his name and age. Display the information in table format along with either the voter can vote or not

7. Java Script Pre-defined and User-defined Objects

a. Write a program using document object properties and methods.
b. Write a program using window object properties and methods.
c. Write a program using array object properties and methods.

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Guntur - 522 017, Andhra Pradesh.
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

d. Write a program using math object properties and methods.
e. Write a program using string object properties and methods.
f. Write a program using regex object properties and methods.
g. Write a program using date object properties and methods.
h. Write a program to explain user-defined object by using properties, methods, accessors, constructors and display.

8. Java Script Conditional Statements and Loops

a. Write a program which asks the user to enter three integers, obtains the numbers from the user and outputs HTML text that displays the larger number followed by the words "LARGER NUMBER" in an information message dialog. If the numbers are equal, output HTML text as "EQUAL NUMBERS".
b. Write a program to display week days using switch case.
c. Write a program to print 1 to 10 numbers using for, while and do-while loops.
d. Write aprogram to print data in object using for-in, for-each and for-of loops
e. Develop a program to determine whether a given number is an 'ARMSTRONG NUMBER' or not. [Eg: 153 is an Armstrong number, since sum of the cube of the digits is equal to the number i.e.,13 + 53+ 33 = 153]
f. Write a program to display the denomination of the amount deposited in the bank in terms of 100's, 50's, 20's, 10's, 5's, 2's & 1's. (Eg: If deposited amount is Rs.163, the output should be 1-100's, 1-50's, 1- 10's, 1-2's & 1-1's)

9. Java Script Functions and Events

a. Design a appropriate function should be called to display
   i. Factorial of that number
   ii. Fibonacci series up to that number
   iii. Prime numbers up to that number
   iv. Is it palindrome or not
b. Design a HTML having a text box and four buttons named Factorial, Fibonacci, Prime, and Palindrome. When a button is pressed an appropriate function should be called to display
   i. Factorial of that number
   ii. Fibonacci series up to that number
   iii. Prime numbers up to that number
   iv. Is it palindrome or not
c. Write a program to validate the following fields in a registration page
   i. Name (start with alphabet and followed by alphanumeric and the length should not be less than 6 characters)
   ii. Mobile (only numbers and length 10 digits)
   iii. E-mail (should contain format like xxxxxxx@xxxxxx.xxx)
   iv. Develop one appplication

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Text Books:

1. Programming the World Wide Web, 7th Edition, Robet W Sebesta, Pearson, 2013.
2. Web Programming with HTML5, CSS and JavaScript, John Dean, Jones & Bartlett Learning, 2019 (Chapters 1-11).
3. Pro MERN Stack: Full Stack Web App Development with Mongo, Express, React, and Node, Vasan Subramanian, 2nd edition, APress, O'Reilly.

Web Links:

1. https://www.w3schools.com/html
2. https://www.w3schools.com/css
3. https://www.w3schools.com/js/
4. https://www.w3schools.com/nodejs

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

II Year II Semester

L	T	P	C
1	0	2	2

DESIGN THINKING & INNOVATION

Course Objectives: The objectives of the course are to

- Bring awareness on innovative design and new product development.
- Explain the basics of design thinking.
- Familiarize the role of reverse engineering in product development.
- Train how to identify the needs of society and convert into demand.
- Introduce product planning and product development process.

UNIT – I Introduction to Design Thinking

Introduction to elements and principles of Design, basics of design-dot, line, shape, form as fundamental design components. Principles of design. Introduction to design thinking, history of Design Thinking, New materials in Industry.

UNIT - II Design Thinking Process

Design thinking process (empathize, analyze, idea & prototype), implementing the process in driving inventions, design thinking in social innovations. Tools of design thinking - person, costumer, journey map, brainstorming, product development

Activity: Every student presents their idea in three minutes, Every student can present design process in the form of flow diagram or flow chart etc. Every student should explain about product development.

UNIT - III Innovation

Art of innovation, Difference between innovation and creativity, role of creativity and innovation in organizations. Creativity to Innovation. Teams for innovation, Measuring the impact and value of creativity.

Activity: Debate on innovation and creativity, Flow and planning from idea to innovation, Debate on value-based innovation.

UNIT - IV Product Design

Problem formation, introduction to product design, Product strategies, Product value, Product planning, product specifications. Innovation towards product design Case studies.

Activity: Importance of modeling, how to set specifications, Explaining their own product design.

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UNIT – V **Design Thinking in Business Processes**

Design Thinking applied in Business & Strategic Innovation, Design Thinking principles that redefine business – Business challenges: Growth, Predictability, Change, Maintaining Relevance, Extreme competition, Standardization. Design thinking to meet corporate needs. Design thinking for Startups. Defining and testing Business Models and Business Cases. Developing & testing prototypes.

Activity: How to market our own product, about maintenance, Reliability and plan for startup.

Textbooks:

1. Tim Brown, Change by design, 1/e, Harper Bollins, 2009.
2. Idris Mootee, Design Thinking for Strategic Innovation, 1/e, Adams Media, 2014.

Reference Books:

1. David Lee, Design Thinking in the Classroom, Ulysses press, 2018.
2. Shrrutin N Shetty, Design the Future, 1/e, Norton Press, 2018.
3. William lidwell, Kritinaholden, &Jill butter, Universal principles of design, 2/e, Rockport Publishers, 2010.
4. Chesbrough.H, The era of open innovation, 2003.

Online Learning Resources:

- https://nptel.ac.in/courses/110/106/110106124/
- https://nptel.ac.in/courses/109/104/109104109/
- https://swayam.gov.in/nd1_noc19_mg60/preview
- https://onlinecourses.nptel.ac.in/noc22_de16/preview

Course Outcomes:

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

II Year-I Semester (Common to ECE)

L	T	P	C
0	1	2	2

DATA STRUCTURES USING PYTHON

List of Experiments:

1. Write a Python program for class, Flower, that has three instance variables of type str, int, and float that respectively represent the name of the flower, its number of petals, and its price. Your class must include a constructor method that initializes each variable to an appropriate value, and your class should include methods for setting the value of each type, andretrieving the value of each type.
2. Develop an inheritance hierarchy based upon a Polygon class that has abstract methods area( ) and perimeter( ). Implement classes Triangle, Quadrilateral, Pentagon, that extend this base class, with the obvious meanings for the area( ) and perimeter( ) methods. Write a simple program that allows users to create polygons of the various types and input their geometric dimensions, and the program then outputs their area and perimeter
3. Write a python program to implement Method Overloading and Method Overriding.
4. Write a Python program to illustrate the following comprehensions: a) List Comprehensions b) Dictionary Comprehensions c) Set Comprehensions d) Generator Comprehensions
5. Write a Python program to generate the combinations of n distinct objects taken fromthe elements of a given list. Example: Original list: [1, 2, 3, 4, 5, 6, 7, 8, 9] Combinations of 2 distinct objects: [1, 2] [1, 3] [1, 4] [1, 5] [7,8] [7, 9] [8, 9].
6. Write a program for Linear Search and Binary search.
7. Write a program to implement Bubble Sort and Selection Sort.
8. Write a program to implement Merge sort and Quick sort.
9. Write a program to implement Stacks and Queues.
10. Write a program to implement Singly Linked List.
11. Write a program to implement Doubly Linked list.
12. Write a program to implement Binary Search Tree.

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(AUTONOMOUS)

Guntur - 522 017, Andhra Pradesh.

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

OURSE STRUCTURE–M.TECH (CSE) - MR23

(Applicable from the 2023-24 admitted batches)

III Semester

S.No	Course Code	Courses	Category	L	T	P	C
1	MTCSE2101	**ProgramElective-5** 1. Deep Learning 2. Social Network Analysis 3. MOOCs-1(NPTEL/SWAYAM)12 Week Program related to the Programme which is not listed in the course structure	PE	3	0	0	3
2	MTCSE2102	**Open Elective** 1. MOOCs-2 (NPTEL/SWAYAM)-Any 12 Week Course on Engineering/ Management/ Mathematics offered by other than parent department 2. Course offered by other departments in the college	OE	3	0	0	3
3	MTCSE2103	**Dissertation-I/Industrial Project#**	PJ	0	0	20	10
Total Credits							16

COURSE STRUCTURE–M.TECH (CSE) - MR23

(Applicable from the 2023-24 admitted batches)

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(AUTONOMOUS)

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

IV Semester:

M.Tech.(CSE)IVSEMESTER							
S.No	**Course Code**	**Courses**	**Category**	**L**	**T**	**P**	**C**
1	MTCSE2201	**Dissertation-II**	PJ	0	0	32	16
		Total Credits					16

Open Electives offered by the Department of CSE

1. Python Programming
2. Principles of Cyber Security
3. Internet of Things
4. Machine Learning
5. Digital forensics
6. NextGeneration Databases.

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(AUTONOMOUS)

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

II Year-I Semester		L	T	P	C
		3	0	0	3
Deep Learning (MTCSE1102)					

Course Objectives:

At the end of the course, the students will be expected to:

- Learn deep learning methods for working with sequential data,
- Learn deep recurrent and memory networks,
- Learn deepTuring machines,
- Apply such deep learning mechanisms to various learning problems.
- Know the open issues in deep learning, and have a grasp of the current research directions.

Course Outcomes:

After the completion of the course, student will be able to

- Demonstratethebasicconceptsfundamentallearningtechniquesandlayers.
- Discuss the Neural Network training, various and om models.
- Explain different types of deep learning network models.
- Classify the Probabilistic Neural Networks.
- Implement tools on Deep Learning techniques.

UNITI:Introduction: Variousparadigmsoflearningproblems,PerspectivesandIssuesindeeplearning framework,reviewoffundamentallearningtechniques.**Feedforwardneuralnetwork:**ArtificialNeural Network, activation function, multi-layer neural network.

UNIT II: Training Neural Network: Risk minimization, loss function, back propagation, regularization, model selection, and optimization.

Conditional Random Fields: Linear chain, partition function, Markov network, Belief propagation, Training CRFs, Hidden Markov Model, Entropy.

UNITIII: Deep Learning: Deep Feed Forward network, regularizations, training deep models, dropouts, Convolution Neural Network, Recurrent Neural Network, and Deep Belief Network.

UNIT IV: Probabilistic Neural Network: Hopfield Net, Boltz mann machine, RBMs, Sigmoid net, Auto encoders.

UNITV: Applications: Object recognition, sparse coding, computer vision, natural language processing.

Introduction to Deep Learning Tools: Caffe, Theano, Torch.

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

TextBooks:

1. Goodfellow,I.,Bengio,Y.,andCourville,A.,DeepLearning,MITPress,2016..
2. Bishop,C.,M.,Pattern Recognition and Machine Learning, Springer, 2006.

ReferenceBooks:

1. Artificial Neural Networks, Yegnanarayana, B., PHILearningPvt.Ltd,2009.
2. Matrix Computations, Golub,G.,H., andVanLoan,C.,F, JHU Press,2013.
3. NeuralNetworks:AClassroomApproach,SatishKumar,TataMcGraw-HillEducation,2004.

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

II Year-I Semester		L	T	P	C
		3	0	0	3
Social Network Analysis					

Course Objectives:

- The learning objective ofthe course SocialNetwork Analysis is to provide students withessential knowledge of network analysis applicable to real world data, with examples from today's most popular social networks.

Course Outcomes:

- After thecompletionofthecourse,studentwillbeableto
- Demonstratesocialnetworkanalysisandmeasures.
- Analyzerandomgraphmodelsandnavigate socialnetworksdata
- ApplythenetworktopologyandVisualization tools.
- Analyzetheexperimentwithsmallworldmodelsandclusteringmodels.
- Comparethe applicationdrivenvirtualcommunitiesfromsocialnetworkStructure.

UNIT I: Social Network Analysis: Preliminaries and definitions, Erdos Number Project, Centrality measures, Balance and Homophily.

UNIT II: Random graph models: Random graphs and alternative models, Models of network growth, Navigation in social Networks, Cohesive subgroups, Multidimensional Scaling, Structural equivalence, roles and positions.

UNIT III: Network topology and diffusion, Contagion in Networks, Complex contagion, Percolationand information, Navigation in Networks Revisited.

UNIT IV: Small world experiments, small world models, origins of small world, Heavy tails, Small Diameter, Clustering of connectivity, The ErdosRenyi Model, Clustering Models.

UNIT V: Network structure -Important vertices and page rank algorithm, towards rationaldynamics in networks, basics of game theory, Coloring and consensus, biased voting, network formation games, network structure and equilibrium, behavioral experiments, Spatial and agent-based models.

TextBooks:

1. S.WassermanandK.Faust.SocialNetworkAnalysis:MethodsandApplications(Cambridge,Cambridge University Press, 1994)
2. D.EasleyandJ.Kleinberg,Networks,CrowdsandMarkets:Reasoningaboutahighlyconnected world-2010

ReferenceBooks:

1. SocialNetworkAnalysis:MethodsandApplications(StructuralAnalysisintheSocial Sciences) by Stanley Wasserman, Katherine Faust, 1994.

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

II Year-I Semester		L	T	P	C
		3	0	0	3
Python Programming					

Course Objectives:

- To acquire programming skills in core Python.
- To acquire Object Oriented Skills in Python.
- To develop the skill of designing Graphical user Interfaces in Python.
- To develop the ability to write database applications in Python.

Course Outcomes(COs): At the end of the course, student will be able to

- Understand and comprehend the basics of python programming.
- Demonstrate the principles of structured programming and be able to describe, design, implement, and test structured programs using currently accepted methodology.
- Explain the use of the built-in data structures list, sets, tuples and dictionary.
- Make use of functions and its applications.
- Identify real-world applications using oops, files and exception handling provided by python.

UNIT– I:

Introduction: History of Python, Need of Python Programming, Applications Basics of Python Programming Using the REPL(Shell), Running Python Scripts, Variables, Assignment, Keywords, Input-Output, Indentation.

UNIT– II:

Types, Operators and Expressions: Types - Integers, Strings, Booleans; Operators- Arithmetic Operators, Comparison (Relational) Operators, Assignment Operators, Logical Operators, Bitwise Operators, Membership Operators, Identity Operators, Expressions and order of evaluations ControlFlow-if, if-elif-else, for, while, break, continue, pass

UNIT– III:

Data Structures-Lists- Operations, Slicing, Methods, Tuples, Sets, Dictionaries, Sequences, Comprehensions.

UNIT– IV:

Functions - Defining Functions, Calling Functions, Passing Arguments, Keyword Arguments, Default Arguments, Variable-length arguments, Anonymous Functions, Fruitful Functions (Function Returning Values), Scopeofthe Variables in a Function - Globaland LocalVariables, **Modules**: Creating modules, import statement, from. Import statement, name spacing, **Python packages**, Introduction to PIP,Installing Packages via PIP, Using Python Packages

UNIT– V:

Object Oriented Programming OOP in Python: Classes, 'self variable', Methods, Constructor Method, Inheritance, Overriding Methods, Data hiding, **Error and Exceptions:** Difference between an error and Exception, Handling Exception, try except block, Raising Exceptions, User defined Exceptions, **Brief Tour of the Standard Library** - Operating System Interface - String Pattern Matching, Mathematics,

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Internet Access, Dates and Times, Data Compression, Multithreading, GUI Programming, Turtle Graphics, **Testing:** Why testing is required ?, Basic concepts of testing, Unit testing in Python, Writing Test cases, Running Tests.

TextBooks:

1. Fundamentals of Python First Programs, Kenneth.A. Lambert,Cengage
2. Introduction to Programming Using Python, Y.DanielLiang,Pearson

ReferenceBooks:

1. Introduction to Python Programming, Gowri shankar.S, VeenaA, CRC Press
2. Think Python, Allen Downey, Green Tea Press
3. Core Python Programming, W. Chun, Pearson.

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

II Year-I Semester		L	T	P	C
		3	0	0	3
Principles of Cyber Security					

Course Objectives:

- To learn threats and risks with in context of the cyber security architecture.
- Student should learn and Identify security tools and hardening techniques.
- To learn types of incidents including categories, responses and timelines for response.

Course Outcomes: At the end of the course, student will be able to

- Apply cyber security architecture principles.
- Describe risk management processes and practices.
- Appraise cyber security incidents to apply appropriate response
- Distinguish system and application security threats and vulnerabilities.
- Identify security tools and hardening techniques

UNIT–I: Introduction to Cyber security- Cyber security objectives, Cyber security roles, Differences between Information Security & Cyber security, **Cyber security Principles-**Confidentiality, integrity, &availability Authentication & non- repudiation.

UNIT–II: Information Security (IS) within Lifecycle Management-Lifecycle management landscape, Security architecture processes, Security architecture tools, Intermediate lifecycle management concepts, **Risks&Vulnerabilities-**Basicsofriskmanagement,Operationalthreatenvironments, Classesofattacks.

UNIT–III: Incident Response- Incident categories, Incident response Incident recovery, and **Operational security protection**: Digital and data assets, ports and protocols, Protection technologies, Identity and access Management, configuration management.

UNIT–IV:Threat Detection and Evaluation (DE): Monitoring- Vulnerability Management, Security Logs and Alerts, Monitoring Tools and Appliances. **Analysis-** Network traffic Analysis, packet capture and analysis

UNIT–V:Introduction to backdoor System andsecurity-Introductiontometasploit,Backdoor, demilitarized zone(DMZ),Digital Signature, Brief study on Harding of operating system.

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

Text Books:

1. NASSCOM: Security Analyst Student Hand Book Dec2015.
2. Information Security Management Principles Updated Edition by David Alexander,Amanda Finch,David Sutton, Published by BCS, June 2013.

Reference Books:

1. CSX-cyber security fundamentals 2ndedition, Published by ISACA, Cyber security, Network Security, Data Governance Security.

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

II Year-I Semester		L	T	P	C
		3	0	0	3
Internet of Things					

Course Objectives:

- To Understand Smart Objects and IoT Architectures.
- To learn about various IOT-related protocols
- To build simple IoT Systems using Arduino and Raspberry Pi.
- To understand data analytics and cloud in the context of IoT
- To develop IoT infrastructure for popular applications.

Course Outcomes: At the end of the course, student will be able to

- Summarize on the term 'internet of things' in different contexts.
- Analyze various protocols for IoT.
- Design a PoCo fan IoT system using Rasperry Pi/ Arduino
- Apply data analytics and use cloud offerings related to IoT.
- Analyze applications of IoT in real time scenario

UNITI:

FUNDAMENTALS OF IoT: Evolution of Internet of Things, Enabling Technologies, IoT Architectures,oneM2M, IoT World Forum (IoTWF) and Alternative IoT models, Simplified IoT Architecture and Core IoT Functional Stack, Fog, Edge and Cloud in IoT, Functional blocks of an IoT ecosystem, Sensors, Actuators, Smart Objects and Connecting Smart Objects.

UNITII:

IoT PROTOCOLS: IT Access Technologies: Physical and MAC layers, topology and Security of IEEE 802.15.4, 802.15.4g, 802.15.4e, 1901.2a, 802.11ah and Lora WAN, Network Layer: IP versions, Constrained Nodes and Constrained Networks, Optimizing IP for IoT: From6LoWPAN to 6Lo, Routing over Low Power and Lossy Networks, Application Transport Methods: Supervisory Control and Data Acquisition, Application Layer Protocols: CoAP and MQTT.

UNITIII:

DESIGN AND DEVELOPMENT: Design Methodology, Embedded computing logic, Microcontroller, System on Chips, IoT system building blocks, Arduino, Board details, IDE programming, Raspberry Pi, Interfaces and Raspberry Pi with Python Programming.

UNITIV:

DATA ANALYTICS AND SUPPORTING SERVICES: Structured Vs Unstructured Data and Data in Motion Vs Data in Rest, Role of Machine Learning – No SQL Databases, Hadoop Ecosystem, Apache Kafka, Apache Spark, Edge Streaming Analytics and Network Analytics, Xively Cloud for IoT, Python Web Application

Frame work, Django, AWS for IoT, System Management with NETCONF-YANG.

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Guntur - 522 017, Andhra Pradesh.

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

UNITV:

CASE STUDIES/INDUSTRIAL APPLICATIONS: Cisco IoT system, IBM Watson IoT platform, Manufacturing, Converged Plant wide Ethernet Model (CPwE),Power Utility Industry, Grid Blocks Reference Model, Smart and Connected Cities: Layered architecture, Smart Lighting, Smart Parking Architecture and Smart Traffic Control.

Text Books:

1. IoT Fundamentals: Networking Technologies, Protocols and Use Cases for Internet of Things, David Hanes, Gonzalo Salgueiro, Patrick Grossetete, Rob Barton and Jerome Henry, Cisco Press, 2017

Reference Books:

2. Internet of Things–A hands-on approach, Arshdeep Bahga, Vijay Madisetti,Universities Press, 2015
3. The Internet of Things – Key applications and Protocols, Olivier Hersent, David Boswarthick, Omar Elloumi and Wiley, 2012 (for Unit 2).
4. "From Machine-to-Machine to the Internet of Things – Introduction to a New Age of Intelligence", Jan Ho¨ ller, Vlasios Tsiatsis, Catherine Mulligan, Stamatis, Karnouskos, Stefan Avesand. David Boyle and Elsevier, 2014.
5. Architecting the Internet of Things, Dieter Uckelmann, Mark Harrison, Michahelles and Florian(Eds), Springer, 2011.
6. Recipes to Begin, Expand, and Enhance Your Projects, 2nd Edition, Michael Margolis, Arduino Cookbook and O'Reilly Media, 2011.

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(AUTONOMOUS)

Guntur - 522 017, Andhra Pradesh.

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

II Year-I Semester		L	T	P	C
		3	0	0	3
Machine Learning					

Course Objectives:

Machine Learning course will

- Develop an appreciation for what is involved in learning from data.
- Demonstrate a wide variety of learning algorithms.
- Demonstrate how to apply a variety of learning algorithms to data.
- Demonstratehowtoperformevaluationoflearningalgorithmsandmodelselection.

Course Outcomes: At the end of the course, student will be able to

- Domain Knowledge for Productive use of Machine Learning and Diversity
- of Data. Demonstrate on Supervised and Computational Learning
- Analyze on Statistics in learning techniques and
- Logistic Regression Illustrate on Support Vector
- Machines and Perceptron Algorithm
- Design a Multilayer Perceptron Networks andclassificationofdecisiontree

UNIT-I: Introduction-Towards Intelligent Machines, Wellposed Problems, Example of Applications in diverse fields, Data Representation, Domain Knowledge for Productive use of Machine Learning, Diversity of Data: Structured / Unstructured, Forms of Learning, Machine Learning and Data Mining, Basic Linear Algebra in Machine Learning Techniques.

UNIT-II: Supervised Learning- Rationale and Basics: Learning from Observations, Bias and Why Learning Works: Computational Learning Theory, Occam's Razor Principle and Overfitting Avoidance Heuristic Search in inductive Learning, Estimating Generalization Errors, Metrics for assessing regression, Metris for assessing classification.

UNIT-III: Statistical Learning- Machine Learning and Inferential Statistical Analysis, Descriptive Statistics in learning techniques, Bayesian Reasoning: A probabilistic approach to inference, K-Nearest Neighbor Classifier. Discriminant functions and regression functions, Linear Regression with Least Square Error Criterion, Logistic Regression for Classification Tasks, Fisher's Linear Discriminant and Thresholding for Classification, Minimum Description Length Principle.

UNIT-IV: Support Vector Machines (SVM)- Introduction, Linear Discriminant Functions for Binary Classification, Perceptron Algorithm, Large Margin Classifier for linearly seperable data, Linear Soft Margin Classifier for Overlapping Classes, Kernel Induced Feature Spaces, Nonlinear Classifier, Regression by Support vector Machines.

Learning with Neural Networks: Towards Cognitive Machine, Neuron Models, Network Architectures, Perceptrons, Linear neuron and the Widrow-Hoff Learning Rule, The error correction delta rule.

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UNIT -V: Multilayer Perceptron Networks and error back propagation algorithm, Radial Basis Functions Networks. **Decision Tree Learning**: Introduction, Example of classification decision tree, measures of impurity for evaluating splits in decision trees, ID3, C4.5, and CART decision trees, pruning the tree, strengths and weakness of decision tree approach.

Textbooks:

1. Applied Machine Learning, 1st edition M.Gopal, McGraw Hill Education,2018

References:

1. Kevin Murphy, Machine Learning: A Probabilistic Perspective, MIT Press,2012
2. Trevor Hastie, Robert Tibshirani, Jerome Friedman, The Elements of Statistical Learning, Springer 2009 (freely available online)
3. Christopher Bishop, Pattern Recognition and Machine Learning, Springer, 2007.

MR23

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L	T	P	C
2	0	0	0

II Year I Semester

ENVIRONMENTAL SCIENCE

Course Objectives:

- To make the students to get awareness on environment
- To understand the importance of protecting natural resources, ecosystems for future generations and pollution causes due to the day to day activities of human life
- To save earth from the inventions by the engineers.

Course Outcomes:

- Grasp multidisciplinary nature of environmental studies and various renewable and non-renewable resources.
- Understand flow and bio-geo-chemical cycles and ecological pyramids.
- Understand various causes of pollution and solid waste management and related preventive measures.
- About the rainwater harvesting, watershed management, ozone layer depletion and waste land reclamation.
- Casus of population explosion, value education and welfare programmes.

UNIT–I

Multidisciplinary Nature Of Environmental Studies: – Definition, Scope and Importance – Need for Public Awareness.

Natural Resources: Renewable and non-renewable resources – Natural resources and associated problems – Forest resources – Use and over – exploitation, deforestation, case studies – Timber extraction – Mining, dams and other effects on forest and tribal people – Water resources – Use and over utilization of surface and ground water – Floods, drought, conflicts over water, dams – benefits and problems–Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies– Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity,c ase studies.–Energy resources:

UNIT–II

Ecosystems: Concep to fan ecosystem.–Structure and function of an ecosystem– Producers, consumers and decomposers – Energy flow in the ecosystem – Ecological succession – Food chains, food webs and ecological pyramids–Introduction, types, characteristicfeatures, structure and function of the following ecosystem:

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a. Forest ecosystem.
b. Grassl and ecosystem
c. Desert ecosystem
d. Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)

Biodiversity And Its Conservation: Introduction Definition: genetic, species and ecosystem diversity–Bio-geographical classification of India–Value of biodiversity: consumptive use, Productive use, social, ethical, aesthetic and option values – Biodiversity at global, National and locallevels – India as a mega-diversity nation – Hot-sports of biodiversity – Threats to biodiversity: habitat loss,poaching of wildlife, man-wildlife conflicts– Endangered and endemic species of India –Conservation of biodiversity:In-situand Ex-situ conservation of biodiversity.

UNIT–III

Environmental Pollution:Definition, Cause, effects and control measures of:

a. Air Pollution.
b. Water pollution
c. Soil pollution
d. Marine pollution
e. Noise pollution
f. Thermal pollution
g. Nuclear hazards

Solid Waste Management: Causes, effects and control measures of urban and industrial wastes – Roleof an individual in prevention of pollution – Pollution case studies – Disaster management: floods,earthquake,cycloneandlandslides.

UNIT–IV

Social Issues and the Environment: From Unsustainable to Sustainable development–Urban problems related to energy – Water conservation, rain water harvesting, watershed management –Resettlement and rehabilitation of people; its problems and concerns. Case studies – Environmental ethics: Issues and possible solutions–Climate change, global warming, acidrain, ozone layer depletion, nuclear accidents and holocaust. Case Studies – Wastel and reclamation. – Consumerism and waste products. – Environment Protection Act. – Air (Prevention and Control of Pollution) Act. –Water (Prevention and control of Pollution) Act–Wild life Protection Act–Forest Conservation Act–Issues involved inenforcement of environment allegislation–Public awareness.

UNIT–V

Human Population And The Environment: Population growth, variation among nations. Population explosion – Family Welfare Programmes. – Environment and human health –

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Human Rights – Value Education–HIV/AIDS–Women and Child Welfare–Role of information Technology in Environment and human health–Case studies. Field Work:Visit to a local area to document environmental assets River/ forest grassland/ hill/ mountain – Visit to a local polluted site-Urban/Rural/Industrial/Agricultural Study of common plants,insects, and birds–river, hills lopes,etc..

Text books:

1. Text book of Environmental Studies for Undergraduate Courses ErachBharucha for University Grants Commission, Universities Press.
2. Palaniswamy,"Environmental Studies",Pearson education
3. S.AzeemUnnisa,"Environmental Studies"Academic Publishing Company
4. K.RaghavanNambiar,"Text book of Environmental Studies for UndergraduateCourses as per UGC model syllabus", Scitech Publications (India), Pvt.Ltd.

Reference Books:

1. DeekshaDaveandE.SaiBabaReddy, "Text book of Environmental Science",Cengage Publications.
2. M.AnjiReddy,"Text book of Environmental Sciences and Technology",BSPublication.
3. J.P.Sharma,Comprehensive Environmental studies,Laxmi publications.
4. J.GlynnHenryandGaryW.Heinke,"Environmental Sciences and Engineering",Prentice Hall of India Private limited
5. G.R.Chatwal,"A Text Book of Environmental Studies"Himalaya Publishing House
6. Gilbert M.Masters and WendellP.Ela,"Introduction to Environmental Engineeringand Science,Prentice Hall of India Private limited.

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Department of **Information Technology**

Minutes of the Board of Studies (BoS) Meeting

The second BoS meeting of Information Technology Department was conducted on 02.07.2024 from 02.00pm in HOD's chamber through virtual mode via Zoom Online Meeting Platform.
Link:https://us06web.zoom.us/j/83052663223?pwd=CHDx68NUs48wR5NdWouaHIpl8RkNPf.1

Members Present:

S.No	Members	Name & Designation	Status of Attendance	Signature
1	Chairperson	Dr K. Sunitha, Professor & HOD of IT	PRESENT	
2	University Nominee	Dr A Krishna Mohan, Professor of CSE, UCEK, JNTU Kakinada Ph: 9640027540, Email: krishna.ankala@jntucek.ac.in	PRESENT	
3	Subject expert from outside the parent University	1. Dr S V N Sreenivasu Professor, Department of CSE, NEC, Guntur Ph:9849866902 Email: dr.svnsrinivasu@gmail.com	PRESENT	
		2. Dr. K. Nageswara Rao, Professor, Department of CSE, NEC, Guntur Ph: 9866186158 Email: nageswararaokapu@yahoo.com	PRESENT	
4	Representative from Industry	Mr. Anjaneyulu Abburi, Sr. Consultant, Capgemini, Hyderabad Ph: 9676995947 Email: anjaneyulu.abburi@capgemini.com	PRESENT	
5	Alumni Member	Ms. N. Vijaya Lakshmi Asst.Prof., Department of CSE, MLWEC Ph:9885529626 Email: viji1995m.tech@gmail.com	PRESENT	
7	Member	Mr. V. Sudhakar Asst. Prof., MLWEC	PRESENT	
8	Member	Ms. D. U. Durgarani Asst. Prof., MLWEC	PRESENT	
9	Member	Ms. M. Prathyusha Asst. Prof., MLWEC	PRESENT	
10	Member	Ms. S. Kalpana	PRESENT	

		Asst. Prof., MLWEC		
11	Member	Mr K. Naga Brahmachari Asst. Prof., MLWEC	PRESENT	

In the beginning of the meeting the Chairperson of the Committee, **Dr. K. Sunitha,** welcomed all the Internal BoS members and external members and briefed about the course Structure and Course Syllabus designed by JNTUK Regulation-23 (R-23) for II B.Tech Information Technology Programs.

Meeting Agenda:

Item No: 1

Discussion on Proposed Course Structure of II B.Tech, Ratification of the same

Item No: 2

Discussion on Proposed Syllabus of Courses Offered by Department in II B.Tech.

Item No: 3

Discussion on Proposed Model Question Papers of Theory and Lab Courses

Resolutions:

Item No:1 - Discussion on Proposed Course Structure of II- B.Tech Semester-I & Semester-II and Ratifications of the same.

The Course Structure of II B.Tech I-Semester & II-Semester have been discussed in the meeting and the BOS Members are requested for any changes in the courses offered by the Department of IT. As per the suggestions given by the BOS member's, Course Structure is modified without deviating the norms and ratified the same.

Suggestions on Course Structure by the BoS Members:

1. One of external subject experts named **Dr. K. Nageswara Rao** suggested to change the **"Advanced Data Structures & Algorithms"** title as "**Advanced Data Structures & Algorithm Analysis"** of II Year B.Tech I-semester.
2. Mr. Anjaneyulu Abburi, Representative from Industry, suggested to change the **"Advanced Data Structures Lab"** title as "**Advanced Data Structures & Algorithm Analysis Lab"** of II Year B.Tech I-semester.

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Course Structure:

II-B.Tech - I Semester for B.Tech. (IT)

S.No.	Category	Course Code	Title	L	T	P	Credits
1	BS&H	23BS21T01	Discrete Mathematics & Graph Theory	3	0	0	3
2	BS&H	23HM21T01	Universal human values – understanding harmony and Ethical human conduct	2	1	0	3
3	**Engineering Science**	**23ES21T01**	**Digital Logic & Computer Organization**	**3**	**0**	**0**	**3**
4	Professional Core	23CS21T01	Advanced Data Structures & Algorithm Analysis	3	0	0	3
5	Professional Core	23CS21T02	Object Oriented Programming Through Java	3	0	0	3
6	Professional Core	23CS21L01	Advanced Data Structures & Algorithm Analysis Lab	0	0	3	1.5
7	Professional Core	23CS21L02	Object Oriented Programming Through Java Lab	0	0	3	1.5
8	Skill Enhancement course	23CS21S01	Python Programming	0	1	2	2
9	Audit Course	23BS21T01	Environmental Science	2	0	0	-
			Total	16	2	8	20

II-B.Tech - II Semester for B.Tech. (IT)

S.No.	Category	Course Code	Title	L	T	P	Credits
1	Management Course- I	23HM22T02	Optimization Techniques	2	0	0	2
2	Engineering Science/Basic Science	23BS22T01	Probability & Statistics	3	0	0	3
3	**Professional Core**	**23CS22T01**	**Operating Systems**	**3**	**0**	**0**	**3**
4	**Professional Core**	**23CS22T02**	**Database Management Systems**	**3**	**0**	**0**	**3**
5	**Professional Core**	**23CS22T03**	**Software Engineering**	**3**	**0**	**0**	**3**
6	**Professional Core**	**23IT22L01**	**Operating Systems & Software Engineering Lab**	**0**	**0**	**3**	**1.5**
7	**Professional Core**	**23CS22L02**	**Database Management Systems Lab**	**0**	**0**	**3**	**1.5**
8	**Skill Enhancement Course**	**23IT22S01**	**Python with DJango**	**0**	**1**	**2**	**2**
9	**BS&H**	**23BS22L01**	**Design Thinking & Innovation**	**1**	**0**	**2**	**2**
			Total	15	1	10	21
Mandatory Community Service Project Internship of 08 weeks duration duringsummer vacation							

ItemNo:2- Discussion on Proposed Syllabus of Courses Offered by Department in II- B.Tech I-Semester & II-Semester and Ratifications of the same.

Proposed Syllabus of the Courses Offered by the Department of IT presented and the BOS Members are requested for the suggestions if any. As per the suggestions given by the BOS member's, syllabus is modified without deviating the norms and ratified the same.

Suggestions on Course Syllabus by the BoS Members:

1. **Mr. V. Sudhakar**, Faculty Member, suggested to add some basic concepts related to web technology in UNIT-1 of the course **"PYTHON WITH DJANGO (SKILL ENHANCEMENT COURSE)"** of II Year B.Tech II-semester.
2. **Dr A Krishna Mohan**, University Nominee suggested to add "Build static web pages using HTML 5 elements, Apply JavaScript to embed programming interface for web pages and also to perform Client side validations" in UNIT-1 of the course "PYTHON WITH DJANGO (SKILL ENHANCEMENT COURSE)" in II Year B.Tech II semester.
3. One of external subject experts named **Dr S V N Sreenivasu** suggested to add some more lab experiments related to web technology in UNIT-1 of the course **"PYTHON WITH DJANGO (SKILL ENHANCEMENT COURSE)"** in II Year B.Tech II semester. Those are
   1. Design static webpage using HTML 5 elements like Paragraph Element, Division and Span Elements, List Element, Link Element and Creating Table Elements, Table Elements: Colspan/ Rowspan Attributes, border, cell spacing, cell padding attributes.
   2. Write a JavaScript program to find the area of a circle using radius (var and let - reassign and observe the difference with var and let) and PI (const).
   3. Write a JavaScript program to Validate the user by creating a login module:
   (i) Create a validate method with username and password as arguments.
   (ii) If the username and password are equal it will return "Login Successful" else "Login Fail"

The following resolutions are approved

S.NO	Name Of The Subject	UNIT Number	Existing Syllabus According to our JNTUK	Modified Syllabus according to Suggestions
1	PYTHON WITH DJANGO (SKILL ENHANCEMENT COURSE)	UNIT-I	**Python libraries for web development:** Collections-Container datatypes, Tkinter-GUI applications, Requests-HTTP requests, BeautifulSoup4-web scraping, Scrapy, Zappa, Dash, CherryPy, Turbo Gears, Flask, Web2Py, Bottle, Falcon, Cubic Web, Quixote, Pyramid.	**Python libraries for web development:** Build static web pages using HTML 5 elements, Apply JavaScript to embed programming interface for web pages and also to perform Client-side validations, Collections-Container datatypes, Tkinter-GUI applications, Requests-HTTP requests, BeautifulSoup4-web scraping, Scrapy, Zappa, Dash, CherryPy, Turbo Gears, Flask, Web2Py,

4.1c.2

				Bottle, Falcon, Cubic Web, Quixote, Pyramid.
2			**Sample Experiments:** 1. Write a Python GUI program to import Tkinter package and create a window. Set its title and add a label to the window. 2. Write a Python program that designs a simple login form with labels and Entry widgets, arranging them in a grid using the Grid geometry manager. 3. Write a program using BeautifulSoup4 library for web scraping for a given URL 4. Develop a sample Hello World page using Flask framework 5. Develop a sample web page using CherryPy / Web2Py / Bottle Framework	**Sample Experiments:** 1. Design static webpage using HTML 5 elements like Paragraph Element, Division and Span Elements, List Element, Link Element and Creating Table Elements, Table Elements : Colspan/ Rowspan Attributes, border, cell spacing, cell padding attributes. 2. Write a JavaScript program to find the area of a circle using radius (var and let - reassign and observe the difference with var and let) and PI (const). 3. Write a JavaScript program to Validate the user by creating a login module: (i) Create a validate method with username and password as arguments. (ii) If the username and password are equal it will return "Login Successful" else "Login Fail". 4. Write a Python GUI program to import Tkinter package and create a window. Set itstitle and add a label to the window. 5. Write a Python program that designs a simple login form with labels and Entry widgets, arranging them in a grid using the Grid geometry manager. 6. Write a program using BeautifulSoup4 library for web scraping for a given URL 7. Develop a sample Hello World page using Flask framework 8. Develop a sample web page using CherryPy / Web2Py / Bottle Framework

4. The all course syllabuses of the theory subjects as well as the remaining labs that the Chairman submitted have been approved by all of the members including the II-B.Tech - I Semester Audit Course - Environmental Science(to follow the same syllabus as per JNTUK R-23).

Item No: 3

Discussion on Proposed Model Question Papers of Theory and Lab Courses of MR-23
Internal and external exams model question papers of theory and lab courses have been discussed and the BOS Members are requested for any modifications. They suggested as to follow the JNTUK exam pattern as it is.

The updated curriculum is included, taking into account the recommendations made by BOS members.

Finally, Chairperson of BOS thanked all the members of their valuable inputs and active participation in the meeting.

Chairperson
BoS-IT, MLWEC

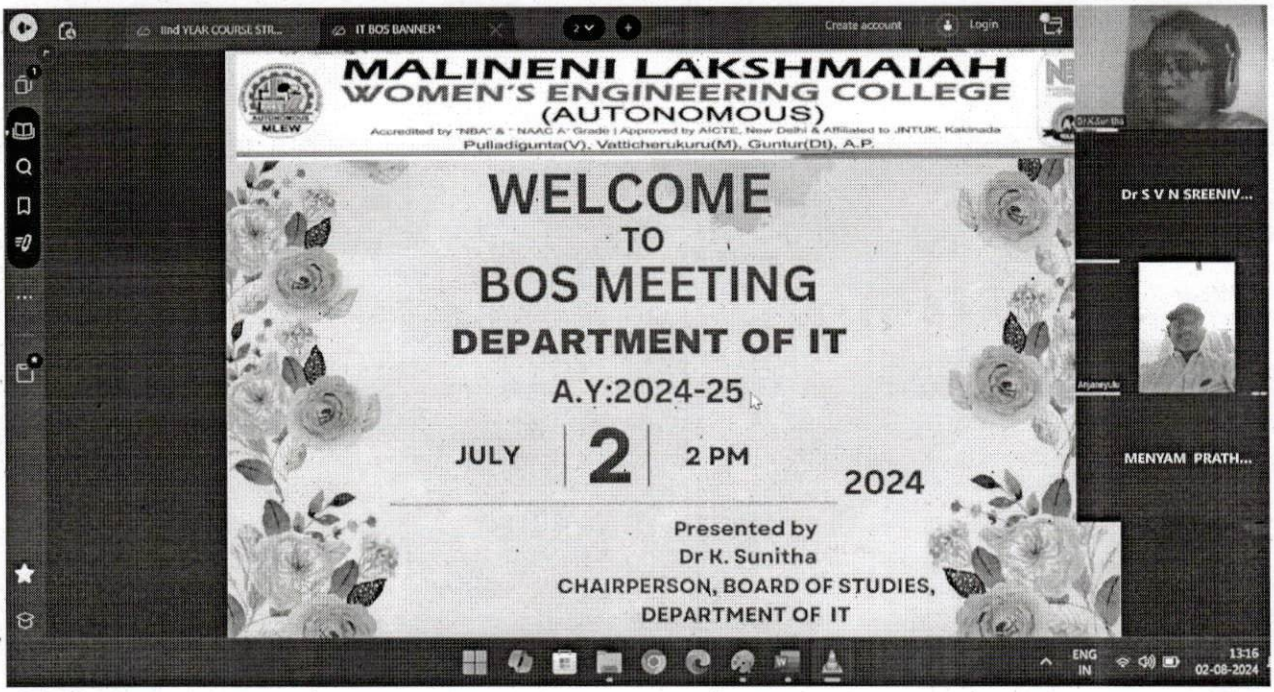
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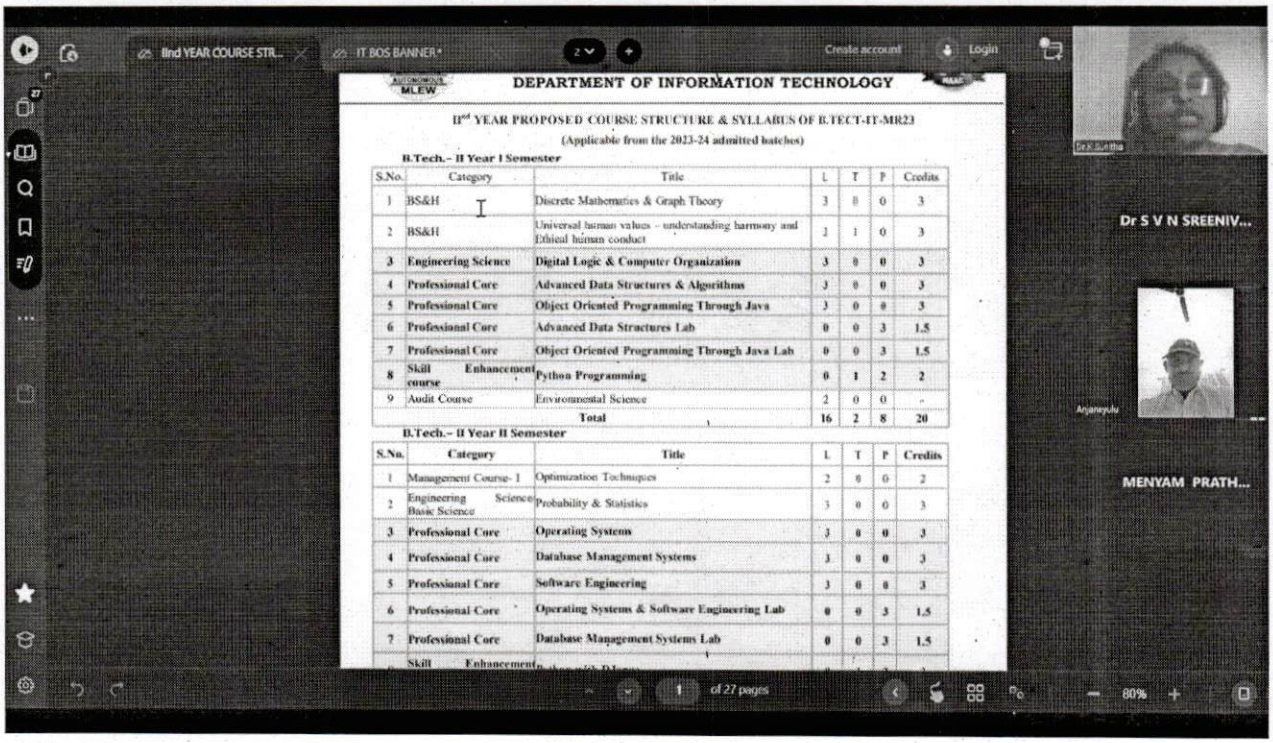
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Board of Studies (BoS) Meeting Screenshots





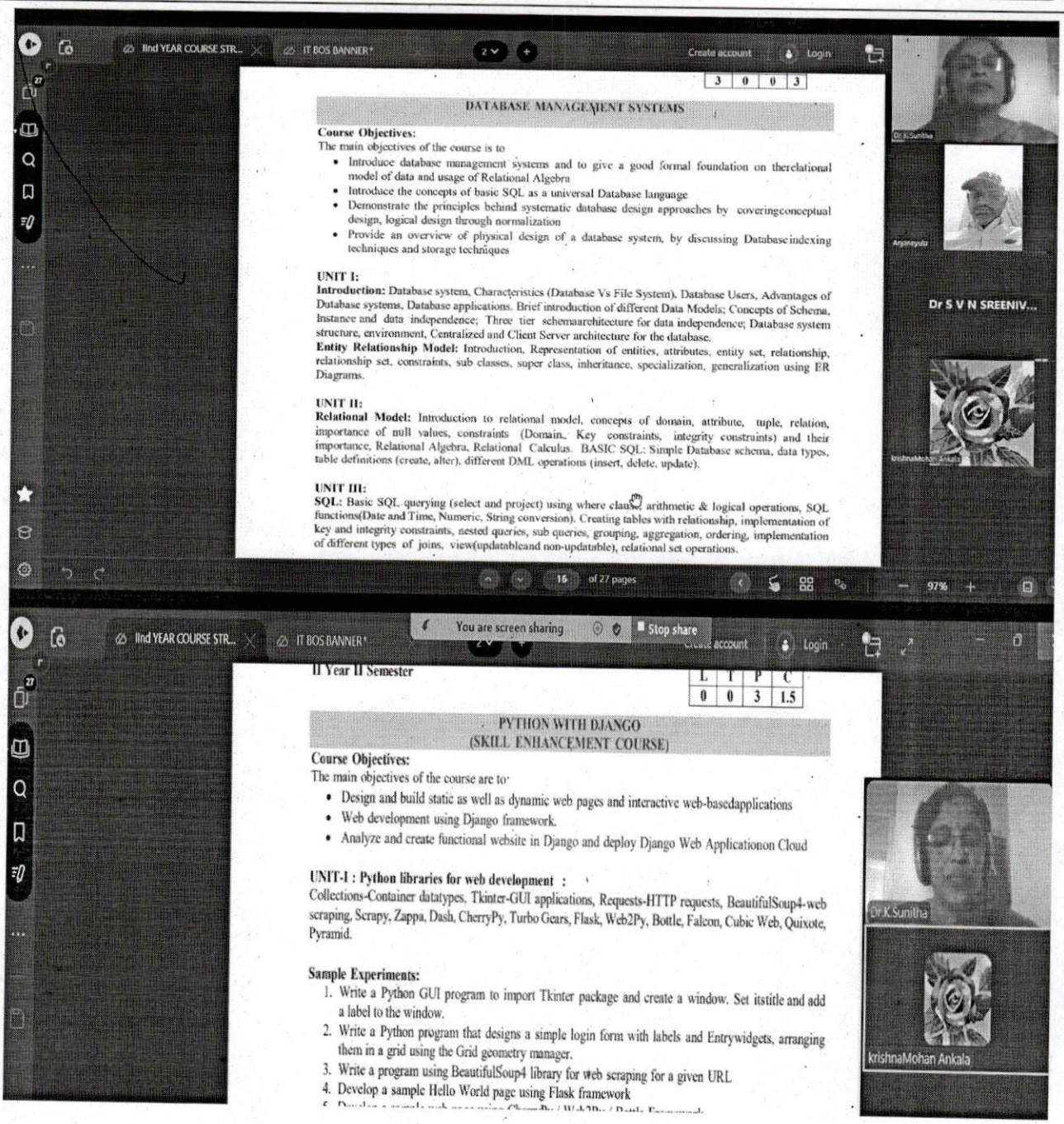
S.No.	Category	Title	L	T	P	Credits
1	BS&H	Discrete Mathematics & Graph Theory	3	0	0	3
2	BS&H	Universal human values – understanding harmony and Ethical human conduct	2	1	0	3
3	Engineering Science	Digital Logic & Computer Organization	3	0	0	3
4	Professional Core	Advanced Data Structures & Algorithms	3	0	0	3
5	Professional Core	Object Oriented Programming Through Java	3	0	0	3
6	Professional Core	Advanced Data Structures Lab	0	0	3	1.5
7	Professional Core	Object Oriented Programming Through Java Lab	0	0	3	1.5
8	Skill Enhancement course	Python Programming	0	1	2	2
9	Audit Course	Environmental Science	2	0	0	-
		Total	16	2	8	20

B.Tech.– II Year II Semester

S.No.	Category	Title	L	T	P	Credits
1	Management Course- 1	Optimization Techniques	2	0	0	2
2	Engineering Science Basic Science	Probability & Statistics	3	0	0	3
3	Professional Core	Operating Systems	3	0	0	3
4	Professional Core	Database Management Systems	3	0	0	3
5	Professional Core	Software Engineering	3	0	0	3
6	Professional Core	Operating Systems & Software Engineering Lab	0	0	3	1.5
7	Professional Core	Database Management Systems Lab	0	0	3	1.5
	Skill Enhancement					

4.12.2

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L	T	P	C
3	0	0	3

DATABASE MANAGEMENT SYSTEMS

Course Objectives:
The main objectives of the course is to

- Introduce database management systems and to give a good formal foundation on therelational model of data and usage of Relational Algebra
- Introduce the concepts of basic SQL as a universal Database language
- Demonstrate the principles behind systematic database design approaches by coveringconceptual design, logical design through normalization
- Provide an overview of physical design of a database system, by discussing Databaseindexing techniques and storage techniques

UNIT I:
Introduction: Database system, Characteristics (Database Vs File System), Database Users, Advantages of Database systems, Database applications. Brief introduction of different Data Models; Concepts of Schema, Instance and data independence; Three tier schemaarchitecture for data independence; Database system structure, environment, Centralized and Client Server architecture for the database.
Entity Relationship Model: Introduction, Representation of entities, attributes, entity set, relationship, relationship set, constraints, sub classes, super class, inheritance, specialization, generalization using ER Diagrams.

UNIT II:
Relational Model: Introduction to relational model, concepts of domain, attribute, tuple, relation, importance of null values, constraints (Domain, Key constraints, integrity constraints) and their importance, Relational Algebra, Relational Calculus. BASIC SQL: Simple Database schema, data types, table definitions (create, alter), different DML operations (insert, delete, update).

UNIT III:
SQL: Basic SQL querying (select and project) using where clause, arithmetic & logical operations, SQL functions(Date and Time, Numeric, String conversion). Creating tables with relationship, implementation of key and integrity constraints, nested queries, sub queries, grouping, aggregation, ordering, implementation of different types of joins, view(updatableand non-updatable), relational set operations.

II Year II Semester

L	T	P	C
0	0	3	1.5

PYTHON WITH DJANGO
(SKILL ENHANCEMENT COURSE)

Course Objectives:
The main objectives of the course are to

- Design and build static as well as dynamic web pages and interactive web-basedapplications
- Web development using Django framework.
- Analyze and create functional website in Django and deploy Django Web Applicationon Cloud

UNIT-I : Python libraries for web development :
Collections-Container datatypes, Tkinter-GUI applications, Requests-HTTP requests, BeautifulSoup4-web scraping, Scrapy, Zappa, Dash, CherryPy, Turbo Gears, Flask, Web2Py, Bottle, Falcon, Cubic Web, Quixote, Pyramid.

Sample Experiments:

1. Write a Python GUI program to import Tkinter package and create a window. Set itstitle and add a label to the window.
2. Write a Python program that designs a simple login form with labels and Entrywidgets, arranging them in a grid using the Grid geometry manager.
3. Write a program using BeautifulSoup4 library for web scraping for a given URL
4. Develop a sample Hello World page using Flask framework

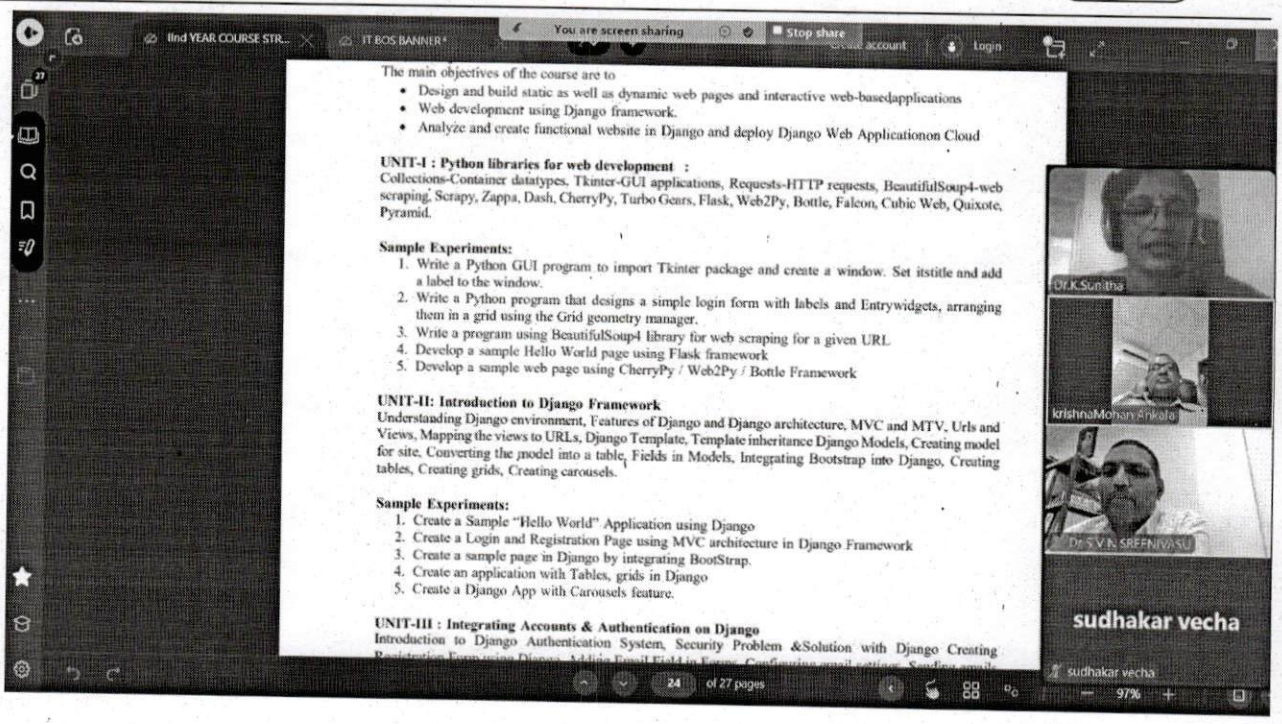
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The main objectives of the course are to

- Design and build static as well as dynamic web pages and interactive web-basedapplications
- Web development using Django framework.
- Analyze and create functional website in Django and deploy Django Web Applicationon Cloud

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Sample Experiments:

1. Write a Python GUI program to import Tkinter package and create a window. Set itstitle and add a label to the window.
2. Write a Python program that designs a simple login form with labels and Entrywidgets, arranging them in a grid using the Grid geometry manager.
3. Write a program using BeautifulSoup4 library for web scraping for a given URL
4. Develop a sample Hello World page using Flask framework
5. Develop a sample web page using CherryPy / Web2Py / Bottle Framework

UNIT-II: Introduction to Django Framework
Understanding Django environment, Features of Django and Django architecture, MVC and MTV, Urls and Views, Mapping the views to URLs, Django Template, Template inheritance Django Models, Creating model for site, Converting the model into a table, Fields in Models, Integrating Bootstrap into Django, Creating tables, Creating grids, Creating carousels.

Sample Experiments:

1. Create a Sample "Hello World" Application using Django
2. Create a Login and Registration Page using MVC architecture in Django Framework
3. Create a sample page in Django by integrating BootStrap.
4. Create an application with Tables, grids in Django
5. Create a Django App with Carousels feature.

UNIT-III : Integrating Accounts & Authentication on Django
Introduction to Django Authentication System, Security Problem &Solution with Django Creating

Dr.K.Sunitha

krishnaMohan Ankala

Dr.S.V.N.SREENIVASU

sudhakar vecha

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24 of 27 pages

97%

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MALINENI LAKSHMAIAH WOMEN'S ENGINEERING COLLEGE
(AUTONOMOUS)
Guntur-522 017, Andhra Pradesh.
DEPARTMENT OF INFORMATION TECHNOLOGY

II[nd] YEAR PROPOSED COURSE STRUCTURE & SYLLABUS OF B.TECT-IT-MR23

(Applicable from the 2023-24 admitted batches)

B.Tech.– II Year I Semester

S.No.	Category	Course Code	Title	L	T	P	Credits
1	BS&H	23BS21T01	Discrete Mathematics & Graph Theory	3	0	0	3
2	BS&H	23HM21T01	Universal human values – understanding harmony and Ethical human conduct	2	1	0	3
3	**Engineering Science**	**23ES21T01**	**Digital Logic & Computer Organization**	**3**	**0**	**0**	**3**
4	**Professional Core**	**23CS21T01**	**Advanced Data Structures & Algorithm Analysis**	**3**	**0**	**0**	**3**
5	**Professional Core**	**23CS21T02**	**Object Oriented Programming Through Java**	**3**	**0**	**0**	**3**
6	**Professional Core**	**23CS21L01**	**Advanced Data Structures & Algorithm Analysis Lab**	**0**	**0**	**3**	**1.5**
7	**Professional Core**	**23CS21L02**	**Object Oriented Programming Through Java Lab**	**0**	**0**	**3**	**1.5**
8	**Skill Enhancement course**	**23CS21S01**	**Python Programming**	**0**	**1**	**2**	**2**
9	**Audit Course**	**23BS21T01**	**Environmental Science**	**2**	**0**	**0**	**-**
			Total	**16**	**2**	**8**	**20**

B.Tech.– II Year II Semester

S.No.	Category	Course Code	Title	L	T	P	Credits
1	Management Course- I	23HM22T02	Optimization Techniques	2	0	0	2
2	Engineering Science/Basic Science	23BS22T01	Probability & Statistics	3	0	0	3
3	**Professional Core**	**23CS22T01**	**Operating Systems**	**3**	**0**	**0**	**3**
4	**Professional Core**	**23CS22T02**	**Database Management Systems**	**3**	**0**	**0**	**3**
5	**Professional Core**	**23CS22T03**	**Software Engineering**	**3**	**0**	**0**	**3**
6	**Professional Core**	**23IT22L01**	**Operating Systems & Software Engineering Lab**	**0**	**0**	**3**	**1.5**
7	**Professional Core**	**23CS22L02**	**Database Management Systems Lab**	**0**	**0**	**3**	**1.5**
8	**Skill Enhancement Course**	**23IT22S01**	**Python with DJango**	**0**	**1**	**2**	**2**
9	**BS&H**	**23BS22L01**	**Design Thinking & Innovation**	**1**	**0**	**2**	**2**
			Total	15	1	10	21
Mandatory Community Service Project Internship of 08 weeks duration duringsummer vacation							

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II Year I Semester

L	T	P	C
3	0	0	3

DIGITAL LOGIC & COMPUTER ORGANIZATION

Course Objectives:
The main objectives of the course is to

- provide students with a comprehensive understanding of digital logic designprinciples and computer organization fundamentals
- Describe memory hierarchy concepts
- Explain input/output (I/O) systems and their interaction with the CPU, memory, andperipheral devices

UNIT – I:
Data Representation: Binary Numbers, Fixed Point Representation. Floating Point Representation. Number base conversions, Octal and Hexadecimal Numbers, components, Signed binary numbers, Binary codes
Digital Logic Circuits-I: Basic Logic Functions, Logic gates, universal logic gates, Minimization of Logic expressions. K-Map Simplification, Combinational Circuits, Decoders, Multiplexers

UNIT – II:
Digital Logic Circuits-II: Sequential Circuits, Flip-Flops, Binary counters, Registers, Shift Registers, Ripple counters
Basic Structure of Computers: Computer Types, Functional units, Basic operational concepts, Bus structures, Software, Performance, multiprocessors and multi computers, Computer Generations,Von- Neumann Architecture

UNIT – III:
Computer Arithmetic: Addition and Subtraction of Signed Numbers, Design of Fast Adders, Multiplication of Positive Numbers, Signed-operand Multiplication, Fast Multiplication, Integer Division, Floating-Point Numbers and Operations
Processor Organization: Fundamental Concepts, Execution of a Complete Instruction, Multiple-Bus Organization, Hardwired Control and Multi programmed Control

UNIT – IV:
The Memory Organization: Basic Concepts, Semiconductor RAM Memories, Read-Only Memories, Speed, Size and Cost, Cache Memories, Performance Considerations, Virtual Memories, Memory Management Requirements, Secondary Storage

UNIT – V:
Input/Output Organization: Accessing I/O Devices, Interrupts, Processor Examples, Direct Memory Access, Buses, Interface Circuits, Standard I/O Interfaces

Textbooks:

1. Computer Organization, Carl Hamacher, ZvonkoVranesic, Safwat Zaky, 6th edition,McGraw Hill
2. Digital Design, 6th Edition, M. Morris Mano, Pearson Education.
3. Computer Organization and Architecture, William Stallings, 11thEdition, Pearson.

Reference Books:

1. Computer Systems Architecture, M.Moris Mano, 3rd Edition, Pearson
2. Computer Organization and Design, David A. Paterson, John L.Hennessy,Elsevier
3. Fundamentals of Logic Design, Roth, 5th Edition, Thomson

Online Learning Resources:

1. https://nptel.ac.in/courses/106/103/106103068/

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II Year I Semester

L	T	P	C
3	0	0	3

ADVANCED DATA STRUCTURES & ALGORITHMS

Course Objectives:

The main objectives of the course is to

- provide knowledge on advance data structures frequently used in Computer Sciencedomain
- Develop skills in algorithm design techniques popularly used
- Understand the use of various data structures in the algorithm design

UNIT – I:

Introduction to Algorithm Analysis, Space and Time Complexity analysis, AsymptoticNotations.
AVL Trees – Creation, Insertion, Deletion operations and Applications
B-Trees – Creation, Insertion, Deletion operations and Applications

UNIT – II:

Heap Trees (Priority Queues) – Min and Max Heaps, Operations and Applications
Graphs – Terminology, Representations, Basic Search and Traversals, Connected Components and Biconnected Components, applications
Divide and Conquer: The General Method, Quick Sort, Merge Sort, Strassen's matrixmultiplication, Convex Hull

UNIT – III:

Greedy Method: General Method, Job Sequencing with deadlines, Knapsack Problem, Minimum cost spanning trees, Single Source Shortest Paths
Dynamic Programming: General Method, All pairs shortest paths, Single Source Shortest Paths– General Weights (Bellman Ford Algorithm), Optimal Binary Search Trees, 0/1 Knapsack, String Editing, Travelling Salesperson problem

UNIT – IV:

Backtracking: General Method, 8-Queens Problem, Sum of Subsets problem, Graph Coloring, 0/1 Knapsack Problem
Branch and Bound: The General Method, 0/1 Knapsack Problem, Travelling Salesperson problem

UNIT – V:

NP Hard and NP Complete Problems: Basic Concepts, Cook's theorem
NP Hard Graph Problems: Clique Decision Problem (CDP), Chromatic Number DecisionProblem (CNDP), Traveling Salesperson Decision Problem (TSP)
NP Hard Scheduling Problems: Scheduling Identical Processors, Job Shop Scheduling

Textbooks:

1. Fundamentals of Data Structures in C++, Horowitz, Ellis; Sahni, Sartaj; Mehta,Dinesh, 2nd Edition Universities Press
2. Computer Algorithms in C++, Ellis Horowitz, SartajSahni, SanguthevarRajasekaran, 2nd Edition University Press

Reference Books:

1. Data Structures and program design in C, Robert Kruse, Pearson Education Asia
2. An introduction to Data Structures with applications, Trembley& Sorenson, McGrawHill

3. The Art of Computer Programming, Vol.1: Fundamental Algorithms, Donald EKnuth, Addison-Wesley, 1997.
4. Data Structures using C & C++: Langsam, Augenstein&Tanenbaum, Pearson, 1995
5. Algorithms + Data Structures & Programs:, N.Wirth, PHI
6. Fundamentals of Data Structures in C++: Horowitz Sahni & Mehta, Galgottia Pub.
7. Data structures in Java:, Thomas Standish, Pearson Education Asia

Online Learning Resources:

1. https://www.tutorialspoint.com/advanced_data_structures/index.asp
2. http://peterindia.net/Algorithms.html
3. Abdul Bari,Introduction to Algorithms (youtube.com)

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II Year I Semester

L	T	P	C
3	0	0	3

OBJECT ORIENTED PROGRAMMING THROUGH JAVA

Course Objectives:

The learning objectives of this course are to:

- Identify Java language components and how they work together in applications
- Learn the fundamentals of object-oriented programming in Java, including defining classes, invoking methods, using class libraries.
- Learn how to extend Java classes with inheritance and dynamic binding and how touse exception handling in Java applications
- Understand how to design applications with threads in Java
- Understand how to use Java APIs for program development

UNIT I

Object Oriented Programming: Basic concepts, Principles,

Program Structure in Java: Introduction, Writing Simple Java Programs, Elements or Tokens in Java Programs, Java Statements, Command Line Arguments, User Input to Programs, Escape Sequences Comments, Programming Style.

Data Types, Variables, and Operators :Introduction, Data Types in Java, Declaration of Variables, Data Types, Type Casting, Scope of Variable Identifier, Literal Constants, Symbolic Constants, Formatted Output with printf() Method, Static Variables and Methods, Attribute Final, **Introduction to Operators**, Precedence and Associativity of Operators, Assignment Operator (=), Basic Arithmetic Operators, Increment (++) and Decrement (- -) Operators, Ternary Operator, Relational Operators, Boolean Logical Operators, Bitwise Logical Operators.

Control Statements: Introduction, if Expression, Nested if Expressions, if–else Expressions, Ternary Operator?:, Switch Statement, Iteration Statements, while Expression, do–while Loop, for Loop, Nested for Loop, For–Each for Loop, Break Statement, Continue Statement.

UNIT II

Classes and Objects: Introduction, Class Declaration and Modifiers, Class Members, Declaration of Class Objects, Assigning One Object to Another, Access Control for Class Members, Accessing Private Members of Class, Constructor Methods for Class, Overloaded Constructor Methods, Nested Classes, Final Class and Methods, Passing Arguments by Value and by Reference, Keyword this.

Methods: Introduction, Defining Methods, Overloaded Methods, Overloaded Constructor Methods, Class Objects as Parameters in Methods, Access Control, Recursive Methods, Nesting of Methods, Overriding Methods, Attributes Final and Static.

UNIT III

Arrays: Introduction, Declaration and Initialization of Arrays, Storage of Array in Computer Memory, Accessing Elements of Arrays, Operations on Array Elements, Assigning Array to Another Array, Dynamic Change of Array Size, Sorting of Arrays, Search for Values inArrays, Class Arrays, Two-dimensional Arrays, Arrays of Varying Lengths, Three-dimensional Arrays, Arrays as Vectors.

Inheritance: Introduction, Process of Inheritance, Types of Inheritances, Universal Super Class-Object Class, Inhibiting Inheritance of Class Using Final, Access Control and Inheritance, Multilevel Inheritance, Application of Keyword Super, Constructor Method and Inheritance, Method Overriding, Dynamic Method Dispatch, Abstract Classes, Interfaces and Inheritance.

Interfaces: Introduction, Declaration of Interface, Implementation of Interface, Multiple Interfaces, Nested Interfaces, Inheritance of Interfaces, Default Methods in Interfaces, Static Methods in Interface, Functional Interfaces, Annotations.

UNIT IV

Packages and Java Library: Introduction, Defining Package, Importing Packages and Classes into Programs, Path and Class Path, Access Control, Packages in Java SE, Java.lang Package and its Classes, Class Object, Enumeration, class Math, Wrapper Classes, Auto-boxing and Auto-unboxing, Java util Classes and Interfaces, Formatter Class, Random Class, Time Package, Class Instant (java.time.Instant), Formatting for Date/Time in Java, Temporal Adjusters Class, Temporal Adjusters Class.

Exception Handling: Introduction, Hierarchy of Standard Exception Classes, Keywords throws and throw, try, catch, and finally Blocks, Multiple Catch Clauses, Class Throwable, Unchecked Exceptions, Checked Exceptions.

Java I/O and File: Java I/O API, standard I/O streams, types, Byte streams, Character streams, Scanner class, Files in Java(Text Book 2).

UNIT V

String Handling in Java: Introduction, Interface Char Sequence, Class String, Methods forExtracting Characters from Strings, Comparison, Modifying, Searching; Class String Buffer. **Multithreaded Programming:** Introduction, Need for Multiple Threads MultithreadedProgramming for Multi-core Processor, Thread Class, Main Thread-Creation of NewThreads, Thread States, Thread Priority-Synchronization, Deadlock and Race Situations,Inter-thread Communication - Suspending, Resuming, and Stopping of Threads.

Java Database Connectivity: Introduction, JDBC Architecture, Installing MySQL andMySQL Connector/J, JDBC Environment Setup, Establishing JDBC Database Connections, ResultSet Interface

Java FX GUI: Java FX Scene Builder, Java FX App Window Structure, displaying text and image, event handling, laying out nodes in scene graph, mouse events (Text Book 3)

Text Books:

1) JAVA one step ahead, Anitha Seth, B.L.Juneja, Oxford.
2) Joy with JAVA, Fundamentals of Object Oriented Programming, Debasis Samanta, Monalisa Sarma, Cambridge, 2023.
3) JAVA 9 for Programmers, Paul Deitel, Harvey Deitel, 4th Edition, Pearson.

References Books:

1) The complete Reference Java, 11thedition, Herbert Schildt,TMH
2) Introduction to Java programming, 7th Edition, Y Daniel Liang, Pearson

Online Resources:

1) https://nptel.ac.in/courses/106/105/106105191/
2) https://infyspringboard.onwingspan.com/web/en/app/toc/lex_auth_012880464547618816347_shared/overview

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II Year I Semester

L	T	P	C
0	0	3	1.5

ADVANCED DATA STRUCTURES LAB

Course Objectives:

The objectives of the course is to

- acquire practical skills in constructing and managing Data structures
- apply the popular algorithm design methods in problem-solving scenarios

Experiments covering the Topics:

- Operations on AVL trees, B-Trees, Heap Trees
- Graph Traversals
- Sorting techniques
- Minimum cost spanning trees
- Shortest path algorithms
- 0/1 Knapsack Problem
- Travelling Salesperson problem
- Optimal Binary Search Trees
- N-Queens Problem
- Job Sequencing

Sample Programs:

1. Construct an AVL tree for a given set of elements which are stored in a file. And implement insert and delete operation on the constructed tree. Write contents of treeinto a new file using in-order.
2. Construct B-Tree an order of 5 with a set of 100 random elements stored in array.Implement searching, insertion and deletion operations.
3. Construct Min and Max Heap using arrays, delete any element and display the contentof the Heap.
4. Implement BFT and DFT for given graph, when graph is represented by

a) Adjacency Matrix b) Adjacency Lists

5. Write a program for finding the biconnected components in a given graph.
6. Implement Quick sort and Merge sort and observe the execution time for variousinput sizes (Average, Worst and Best cases).
7. Compare the performance of Single Source Shortest Paths using Greedy method whenthe graph is represented by adjacency matrix and adjacency lists.
8. Implement Job Sequencing with deadlines using Greedy strategy.
9. Write a program to solve 0/1 Knapsack problem Using Dynamic Programming.
10. Implement N-Queens Problem Using Backtracking.
11. Use Backtracking strategy to solve 0/1 Knapsack problem.
12. Implement Travelling Sales Person problem using Branch and Bound approach.

Reference Books:

1. Fundamentals of Data Structures in C++, Horowitz Ellis, SahniSartaj, Mehta, Dinesh, 2nd Edition, Universities Press
2. Computer Algorithms/C++ Ellis Horowitz, SartajSahni, SanguthevarRajasekaran, 2nd Edition, University Press
3. Data Structures and program design in C, Robert Kruse, Pearson Education Asia
4. An introduction to Data Structures with applications, Trembley& Sorenson, McGrawHill

Online Learning Resources:

1. http://cse01-iiith.vlabs.ac.in/
2. http://peterindia.net/Algorithms.html

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II Year I Semester

L	T	P	C
0	0	3	1.5

OBJECT ORIENTED PROGRAMMING THROUGH JAVA LAB

Course Objectives:

The aim of this course is to

- Practice object oriented programming in the Java programming language
- Implement Classes, Objects, Methods, Inheritance, Exception, Runtime Polymorphism, User defined Exception handling mechanism
- Illustrate inheritance, Exception handling mechanism, JDBC connectivity
- Construct Threads, Event Handling, implement packages, Java FX GUI

Experiments covering the Topics:

- Object Oriented Programming fundamentals- data types, control structures
- Classes, methods, objects, Inheritance, polymorphism,
- Exception handling, Threads, Packages, Interfaces
- Files, I/O streams, JavaFX GUI

Sample Experiments:

Exercise – 1:

a) Write a JAVA program to display default value of all primitive data type of JAVA

b) Write a java program that display the roots of a quadratic equation $ax^2+bx=0$. Calculate thediscriminate D and basing on value of D, describe the nature of root.

Exercise - 2

a) Write a JAVA program to search for an element in a given list of elements using binarysearch mechanism.

b) Write a JAVA program to sort for an element in a given list of elements using bubble sort

c) Write a JAVA program using String Buffer to delete, remove character.

Exercise - 3

a) Write a JAVA program to implement class mechanism. Create a class, methods and invokethem inside main method.

b) Write a JAVA program implement method overloading.

c) Write a JAVA program to implement constructor.

d) Write a JAVA program to implement constructor overloading.

Exercise - 4

a) Write a JAVA program to implement Single Inheritance

b) Write a JAVA program to implement multi level Inheritance

c) Write a JAVA program for abstract class to find areas of different shapes

Exercise - 5

a) Write a JAVA program give example for "super" keyword.

b) Write a JAVA program to implement Interface. What kind of Inheritance can be achieved?

c) Write a JAVA program that implements Runtime polymorphism

Exercise - 6

a) Write a JAVA program that describes exception handling mechanism

b) Write a JAVA program Illustrating Multiple catch clauses

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c) Write a JAVA program for creation of Java Built-in Exceptions
d) Write a JAVA program for creation of User Defined Exception

Exercise - 7

a) Write a JAVA program that creates threads by extending Thread class.First thread display "Good Morning "every 1 sec, the second thread displays "Hello "every 2 seconds and thethird display "Welcome" every 3 seconds.(Repeat the same by implementing Runnable)
b) Write a program illustrating **is Alive** and **join ()**
c) Write a Program illustrating Daemon Threads.
d) Write a JAVA program Producer Consumer Problem

Exercise – 8

a) Write a JAVA program that import and use the user defined packages
b) Without writing any code, build a GUI that display text in label and image in anImageView (use JavaFX)
c) Build a Tip Calculator app using several JavaFX components and learn how to respond touser interactions with the GUI

Exercise – 9

a) Write a java program that connects to a database using JDBC
b) Write a java program to connect to a database using JDBC and insert values into it.
c) Write a java program to connect to a database using JDBC and delete values from it

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II Year I Semester

L	T	P	C
0	1	2	2

PYTHON PROGRAMMING
(SKILL ENHANCEMENT COURSE)

Course Objectives:
The main objectives of the course are to
- Introduce core programming concepts of Python programming language.
- Demonstrate about Python data structures like Lists, Tuples, Sets and dictionaries
- Implement Functions, Modules and Regular Expressions in Python Programming and tocreate practical and contemporary applications using these

UNTI-I:
History of Python Programming Language, Thrust Areas of Python, Installing Anaconda Python Distribution, Installing and Using Jupyter Notebook.
Parts of Python Programming Language: Identifiers, Keywords, Statements and Expressions, Variables, Operators, Precedence and Associativity, Data Types, Indentation, Comments, Reading Input, Print Output, Type Conversions, the type () Function and Is Operator, Dynamic and Strongly Typed Language.
Control Flow Statements: if statement, if-else statement, if...elif...else, Nested if statement, while Loop, for Loop, continue and break Statements, Catching Exceptions Using try and except Statement.

Sample Experiments:
1. Write a program to find the largest element among three Numbers.
2. Write a Program to display all prime numbers within an interval
3. Write a program to swap two numbers without using a temporary variable.
4. Demonstrate the following Operators in Python with suitable examples.
   i) Arithmetic Operators ii) Relational Operators iii) Assignment Operatorsiv) Logical Operators v) Bit wise Operators vi) Ternary Operator vii) Membership Operatorsviii) Identity Operators
5. Write a program to add and multiply complex numbers
6. Write a program to print multiplication table of a given number.

UNIT-II:
Functions: Built-In Functions, Commonly Used Modules, Function Definition and Calling the function, return Statement and void Function, Scope and Lifetime of Variables, Default Parameters, Keyword Arguments, *args and **kwargs, Command Line Arguments.
Strings: Creating and Storing Strings, Basic String Operations, Accessing Characters in String by Index Number, String Slicing and Joining, String Methods, Formatting Strings.
Lists: Creating Lists, Basic List Operations, Indexing and Slicing in Lists, Built-In Functions Used on Lists, List Methods, del Statement.

Sample Experiments:
1. Write a program to define a function with multiple return values.
2. Write a program to define a function using default arguments.
3. Write a program to find the length of the string without using any library functions.
4. Write a program to check if the substring is present in a given string or not.
5. Write a program to perform the given operations on a list:
   i. additionii. insertioniii. slicing
6. Write a program to perform any 5 built-in functions by taking any list.

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UNIT-III:

Dictionaries: Creating Dictionary, Accessing and Modifying key:value Pairs in Dictionaries, Built-In Functions Used on Dictionaries, Dictionary Methods, del Statement.

Tuples and Sets: Creating Tuples, Basic Tuple Operations, tuple() Function, Indexing and Slicing in Tuples, Built-In Functions Used on Tuples, Relation between Tuples and Lists, Relation between Tuples and Dictionaries, Using zip() Function, Sets, Set Methods, Frozenset.

Sample Experiments:

1. Write a program to create tuples (name, age, address, college) for at least twomembers and concatenate the tuples and print the concatenated tuples.
2. Write a program to count the number of vowels in a string (No control flow allowed).
3. Write a program to check if a given key exists in a dictionary or not.
4. Write a program to add a new key-value pair to an existing dictionary.
5. Write a program to sum all the items in a given dictionary.

UNIT-IV:

Files: Types of Files, Creating and Reading Text Data, File Methods to Read and Write Data, Reading and Writing Binary Files, Pickle Module, Reading and Writing CSV Files, Python os and os.path Modules.

Object-Oriented Programming: Classes and Objects, Creating Classes in Python, Creating Objects in Python, Constructor Method, Classes with Multiple Objects, Class Attributes Vs Data Attributes, Encapsulation, Inheritance, Polymorphism.

Sample Experiments:

1. Write a program to sort words in a file and put them in another file. The output file should have only lower-case words, so any upper-case words from source must be lowered.
2. Python program to print each line of a file in reverse order.
3. Python program to compute the number of characters, words and lines in a file.
4. Write a program to create, display, append, insert and reverse the order of the itemsin the array.
5. Write a program to add, transpose and multiply two matrices.
6. Write a Python program to create a class that represents a shape. Include methods to calculate its area and perimeter. Implement subclasses for different shapes like circle, triangle, and square.

UNIT-V:

Introduction to Data Science: Functional Programming, JSON and XML in Python, NumPy with Python, Pandas.

Sample Experiments:

1. Python program to check whether a JSON string contains complex object or not.
2. Python Program to demonstrate NumPy arrays creation using array () function.
3. Python program to demonstrate use of ndim, shape, size, dtype.
4. Python program to demonstrate basic slicing, integer and Boolean indexing.
5. Python program to find min, max, sum, cumulative sum of array
6. Create a dictionary with at least five keys and each key represent value as a list where this list contains at least ten values and convert this dictionary as a pandas data frame and explore the data through the data frame as follows:
   a) Apply head () function to the pandas data frame
   b) Perform various data selection operations on Data Frame
7. Select any two columns from the above data frame, and observe the change in one attribute with respect to other attribute with scatter and plot operations in matplotlib

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Reference Books:

1. Gowrishankar S, Veena A., Introduction to Python Programming, CRC Press.
2. Python Programming, S Sridhar, J Indumathi, V M Hariharan, 2nd Edition, Pearson,2024
3. Introduction to Programming Using Python, Y. Daniel Liang, Pearson.

Online Learning Resources/Virtual Labs:

1. https://www.coursera.org/learn/python-for-applied-data-science-ai
2. https://www.coursera.org/learn/python?specialization=python#syllabus

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II Year I Semester

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2	0	0	--

ENVIRONMENTAL SCIENCE

Course Objectives:

- To make the students to get awareness on environment
- To understand the importance of protecting natural resources, ecosystems for future generations and pollution causes due to the day-to-day activities of human life
- To save earth from the inventions by the engineers.

UNIT – I

Multidisciplinary Nature of Environmental Studies: – Definition, Scope and Importance – Need for Public Awareness.

Natural Resources : Renewable and non-renewable resources – Natural resources and associated problems – Forest resources – Use and over – exploitation, deforestation, case studies – Timber extraction – Mining, dams and other effects on forest and tribal people – Water resources – Use and over utilization of surface and ground water – Floods, drought, conflicts over water, dams – benefits and problems – Mineral resources: Use andexploitation, environmental effects of extracting and using mineral resources, case studies – Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies. – Energy resources:

UNIT – II

Ecosystems: Concept of an ecosystem. – Structure and function of an ecosystem – Producers, consumers and decomposers – Energy flow in the ecosystem – Ecological succession – Food chains, food webs and ecological pyramids – Introduction, types, characteristic features, structure and function of the following ecosystem:

a. Forest ecosystem.
b. Grassland ecosystem
c. Desert ecosystem
d. Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)

Biodiversity and Its Conservation : Introduction and Definition: genetic, species and ecosystem diversity – Bio-geographical classification of India – Value of biodiversity: consumptive use, Productive use, social, ethical, aesthetic and option values – Biodiversity at global, National and local levels – India as a mega-diversity nation – Hot-sports of biodiversity – Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts – Endangered and endemic species of India – Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.

UNIT – III

Environmental Pollution: Definition, Cause, effects and control measures of:

a. Air Pollution.
b. Water pollution

c. Soil pollution
d. Marine pollution
e. Noise pollution
f. Thermal pollution
g. Nuclear hazards

Solid Waste Management: Causes, effects and control measures of urban and industrial wastes – Role of an individual in prevention of pollution – Pollution case studies – Disaster management: floods, earthquake, cyclone and landslides.

UNIT – IV

Social Issues and the Environment: From Unsustainable to Sustainable development – Urban problems related to energy – Water conservation, rain water harvesting, watershed management – Resettlement and rehabilitation of people; its problems and concerns. Case studies – Environmental ethics: Issues and possible solutions – Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case Studies – Wasteland reclamation. – Consumerism and waste products. – Environment Protection Act. – Air (Prevention and Control of Pollution) Act. – Water (Prevention and control of Pollution) Act – Wildlife Protection Act – Forest Conservation Act – Issues involved in enforcement of environmental legislation – Public awareness.

UNIT – V

Human Population And The Environment: Population growth, variation among nations. Population explosion – Family Welfare Programmes. – Environment and human health – Human Rights – Value Education – HIV/AIDS – Women and Child Welfare – Role of information Technology in Environment and human health – Case studies.

Field Work: Visit to a local area to document environmental assets River/forest grassland/hill/mountain – Visit to a local polluted site-Urban/Rural/Industrial/Agricultural Study of common plants, insects, and birds – river, hill slopes, etc.

Textbooks:

1. Erach Bharucha,Text book of Environmental Studies for Undergraduate Courses,Universities Press (India) Private Limited, 2019.
2. Palaniswamy, Environmental Studies, 2/e, Pearson education, 2014.
3. S.Azeem Unnisa, Environmental Studies, Academic Publishing Company, 2021.
4. K.Raghavan Nambiar, "Text book of Environmental Studies for UndergraduateCourses as per UGC model syllabus", SciTech Publications (India), Pvt. Ltd, 2010.

Reference Books:

1. Deeksha Dave and E.Sai Baba Reddy, Textbook of Environmental Science, 2/e,Cengage Publications, 2012.
2. M.Anji Reddy, "Textbook of Environmental Sciences and Technology", BSPublication, 2014.
3. J.P. Sharma, Comprehensive Environmental studies, Laxmi publications, 2006.
4. J..Glynn Henry and Gary W. Heinke, Environmental Sciences and Engineering,Prentice Hall of India Private limited, 1988.
5. G.R. Chatwal, A Text Book of Environmental Studies, Himalaya Publishing House,2018.

6. Gilbert M. Masters and Wendell P. Ela, Introduction to Environmental Engineeringand Science, 1/e, Prentice Hall of India Private limited, 1991.

Online Learning Resources:

- https://onlinecourses.nptel.ac.in/noc23_hs155/preview
- https://www.edx.org/learn/environmental-science/rice-university-ap-r- environmental-science-part-3-pollution-and- resources?index=product&objectID=course-3a6da9f2-d84c-4773-8388-1b2f8f6a75f2&webview=false&campaign=AP%C2%AE+Environmental+Science+ +Part+3%3A+Pollution+and+Resources&source=edX&product_category=course& placement_url=https%3A%2F%2Fwww.edx.org%2Flearn%2Fenvironmental- science
- http://ecoursesonline.iasri.res.in/Courses/Environmental%20Science-I/Data%20Files/pdf/lec07.pdf
- https://www.youtube.com/watch?v=5QxxaVfgQ3k

MALINENI LAKSHMAIAH WOMEN'S ENGINEERING COLLEGE

(AUTONOMOUS)

Guntur-522 017, Andhra Pradesh.

DEPARTMENT OF INFORMATION TECHNOLOGY

II Year II Semester

L	T	P	C
3	0	0	3

OPERATING SYSTEMS

Course Objectives:

The main objectives of the course is to make student

- Understand the basic concepts and principles of operating systems, including processmanagement, memory management, file systems, and Protection
- Make use of process scheduling algorithms and synchronization techniques to achievebetter performance of a computer system.
- Illustrate different conditions for deadlock and their possible solutions.

UNIT - I

Operating Systems Overview: Introduction, Operating system functions, Operating systems operations, Computing environments, Free and Open-Source Operating Systems

System Structures: Operating System Services, User and Operating-System Interface, system calls, Types of System Calls, system programs, Operating system Design and Implementation, Operating system structure, Building and Booting an Operating System, Operating system debugging

UNIT - II

Processes: Process Concept, Process scheduling, Operations on processes, Inter-processcommunication.

Threads and Concurrency: Multithreading models, Thread libraries, Threading issues.

CPU Scheduling: Basic concepts, Scheduling criteria, Scheduling algorithms, Multipleprocessor scheduling.

UNIT – III

Synchronization Tools: The Critical Section Problem, Peterson's Solution, Mutex Locks, Semaphores, Monitors, Classic problems of Synchronization.

Deadlocks: system Model, Deadlock characterization, Methods for handling Deadlocks,Deadlock prevention, Deadlock avoidance, Deadlock detection, Recovery from Deadlock.

UNIT - IV

Memory-Management Strategies: Introduction, Contiguous memory allocation, Paging,Structure of the Page Table, Swapping.

Virtual Memory Management: Introduction, Demand paging, Copy-on-write, Page replacement, Allocation of frames, Thrashing

Storage Management: Overview of Mass Storage Structure, HDD Scheduling.

UNIT - V

File System: File System Interface: File concept, Access methods, Directory Structure; File system **Implementation:** File-system structure, File-system Operations, Directoryimplementation, Allocation method, Free space management; File-System Internals: File- System Mounting, Partitions and Mounting, File Sharing. **Protection:** Goals of protection, Principles of protection, Protection Rings, Domain of protection, Access matrix.

TextBooks:

1. Operating System Concepts, Silberschatz A, Galvin P B, Gagne G, 10th Edition, Wiley, 2018.
2. Modern Operating Systems, Tanenbaum A S, 4th Edition, Pearson , 2016

Reference Books:

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1. Operating Systems -Internals and Design Principles, Stallings W, 9th edition, Pearson,2018
2. Operating Systems: A Concept Based Approach, D.M Dhamdhere, 3rd Edition,McGraw- Hill, 2013

Online Learning Resources:

1. https://nptel.ac.in/courses/106/106/106106144/
2. http://peterindia.net/OperatingSystems.html

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II Year II Semester

L	T	P	C
3	0	0	3

DATABASE MANAGEMENT SYSTEMS

Course Objectives:

The main objectives of the course is to

- Introduce database management systems and to give a good formal foundation on therelational model of data and usage of Relational Algebra
- Introduce the concepts of basic SQL as a universal Database language
- Demonstrate the principles behind systematic database design approaches by coveringconceptual design, logical design through normalization
- Provide an overview of physical design of a database system, by discussing Databaseindexing techniques and storage techniques

UNIT I:

Introduction: Database system, Characteristics (Database Vs File System), Database Users, Advantages of Database systems, Database applications. Brief introduction of different Data Models; Concepts of Schema, Instance and data independence; Three tier schemaarchitecture for data independence; Database system structure, environment, Centralized and Client Server architecture for the database.

Entity Relationship Model: Introduction, Representation of entities, attributes, entity set, relationship, relationship set, constraints, sub classes, super class, inheritance, specialization, generalization using ER Diagrams.

UNIT II:

Relational Model: Introduction to relational model, concepts of domain, attribute, tuple, relation, importance of null values, constraints (Domain, Key constraints, integrity constraints) and their importance, Relational Algebra, Relational Calculus. BASIC SQL: Simple Database schema, data types, table definitions (create, alter), different DML operations (insert, delete, update).

UNIT III:

SQL: Basic SQL querying (select and project) using where clause, arithmetic & logical operations, SQL functions(Date and Time, Numeric, String conversion). Creating tables with relationship, implementation of key and integrity constraints, nested queries, sub queries, grouping, aggregation, ordering, implementation of different types of joins, view(updatableand non-updatable), relational set operations.

UNIT IV:

Schema Refinement (Normalization): Purpose of Normalization or schema refinement, concept of functional dependency, normal forms based on functional dependency Lossless join and dependency preserving decomposition, (1NF, 2NF and 3 NF), concept of surrogate key, Boyce-Coddnormal form (BCNF), MVD, Fourth normal form(4NF), Fifth Normal Form (5NF).

UNIT V:

Transaction Concept: Transaction State, ACID properties, Concurrent Executions, Serializability, Recoverability, Implementation of Isolation, Testing for Serializability, lock based, time stamp based, optimistic, concurrency protocols, Deadlocks, FailureClassification, Storage, Recovery and Atomicity, Recovery algorithm.

Introduction to Indexing Techniques: B+ Trees, operations on B+Trees, Hash BasedIndexing:

Text Books:

1) Database Management Systems, 3rd edition, Raghurama Krishnan, Johannes Gehrke, TMH (For Chapters 2, 3, 4)
2) Database System Concepts,5th edition, Silberschatz, Korth, Sudarsan,TMH (ForChapter 1 and Chapter 5)

Reference Books:

1) Introduction to Database Systems, 8thedition, C J Date, Pearson.
2) Database Management System, 6th edition, Ramez Elmasri, Shamkant B. Navathe,Pearson
3) Database Principles Fundamentals of Design Implementation and Management,Corlos Coronel, Steven Morris, Peter Robb, Cengage Learning.

Web-Resources:

1) https://nptel.ac.in/courses/106/105/106105175/
2)https://infyspringboard.onwingspan.com/web/en/app/toc/lex_auth_012758066672820 22456_shared/overview

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II Year II Semester

L	T	P	C
3	0	0	3

SOFTWARE ENGINEERING

Course Objectives:
The objectives of this course are to introduce

- Software life cycle models, Software requirements and SRS document.
- Project Planning, quality control and ensuring good quality software.
- Software Testing strategies, use of CASE tools, Implementation issues, validation &verification procedures.

UNIT I:
Introduction: Evolution, Software development projects, Exploratory style of software developments, Emergence of software engineering, Notable changes in software development practices, Computer system engineering.
Software Life Cycle Models: Basic concepts, Waterfall model and its extensions, Rapid application development, Agile development model, Spiral model.

UNIT II:
Software Project Management: Software project management complexities, Responsibilities of a software project manager, Metrics for project size estimation, Project estimation techniques, Empirical Estimation techniques, COCOMO, Halstead's software science, risk management.
Requirements Analysis And Specification: Requirements gathering and analysis, Software Requirements Specification (SRS), Formal system specification, Axiomatic specification, Algebraic specification, Executable specification and 4GL.

UNIT III:
Software Design: Overview of the design process, How to characterize a good software design? Layered arrangement of modules, Cohesion and Coupling.approaches to software design.
Agility: Agility and the Cost of Change, Agile Process, Extreme Programming (XP), Other Agile Process Models, Tool Set for the Agile Process (Text Book 2)
Function-Oriented Software Design: Overview of SA/SD methodology, Structured analysis, Developing the DFD model of a system, Structured design, Detailed design, and Design Review.
User Interface Design: Characteristics of a good user interface, Basic concepts, Types of user interfaces, Fundamentals of component-based GUI development, and user interface design methodology.

UNIT IV:
Coding And Testing: Coding, Code review, Software documentation, Testing, Black-box testing, White-Box testing, Debugging, Program analysis tools, Integration testing, Testing object-oriented programs, Smoke testing, and Some general issues associated with testing.
Software Reliability and Quality Management: Software reliability. Statistical testing, Software quality, Software quality management system, ISO 9000.SEI Capability maturity model. Few other important quality standards, and Six Sigma.

UNIT V:
Computer-Aided Software Engineering (Case): CASE and its scope, CASE environment, CASE support in the software life cycle, other characteristics of CASE tools, Towards second generation CASE Tool, and Architecture of a CASE Environment.
Software Maintenance: Characteristics of software maintenance, Software reverse engineering, Software maintenance process models and Estimation of maintenance cost.

Software Reuse: reuse- definition, introduction, reason behind no reuse so far, Basic issuesin any reuse program, A reuse approach, and Reuse at organization level.

Text Books:

1. Fundamentals of Software Engineering, Rajib Mall, 5th Edition,PHI.
2. Software Engineering A practitioner's Approach, Roger S. Pressman, 9th Edition, Mc-Graw Hill International Edition.

Reference Books:

1. Software Engineering, Ian Sommerville,10thEdition, Pearson.
2. Software Engineering, Principles and Practices, Deepak Jain, Oxford UniversityPress.

e-Resources:

1) https://nptel.ac.in/courses/106/105/106105182/
2) https://infyspringboard.onwingspan.com/web/en/app/toc/lex_auth_012605895063871 48827_shared/overview
3) https://infyspringboard.onwingspan.com/web/en/app/toc/lex_auth_013382690411003 904735_shared/overview

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DEPARTMENT OF INFORMATION TECHNOLOGY

II Year II Semester

L	T	P	C
0	0	3	1.5

OPERATING SYSTEMS & SOFTWARE ENGINEERING LAB

Course Objectives:
The main objectives of the course are to

- Provide insights into system calls, file systems, semaphores,
- Develop and debug CPU Scheduling algorithms, page replacement algorithms, threadimplementation
- Implement Bankers Algorithms to Avoid the Dead Lock
- acquire the generic software development skill through various stages of software lifecycle
- generate test cases for software testing

Experiments covering the Topics:

- UNIX fundamentals, commands & system calls
- CPU Scheduling algorithms, thread processing
- IPC, semaphores, monitors, deadlocks
- Page replacement algorithms, file allocation strategies
- Memory allocation strategies
- Software Requirement Specification, DFD, CFD
- Software estimation, UML diagrams, test case design

Sample Experiments in Operating Systems:

1. Practicing of Basic UNIX Commands.
2. Write programs using the following UNIX operating system callsfork, exec, getpid, exit, wait, close, stat, opendir and readdir
3. Simulate UNIX commands like cp, ls, grep, etc.,
4. Simulate the following CPU scheduling algorithms
   a) FCFS b) SJF c) Priority d) Round Robin
5. Control the number of ports opened by the operating system with
   a) Semaphore b) Monitors.
6. Write a program to illustrate concurrent execution of threads using pthreads library.
7. Write a program to solve producer-consumer problem using Semaphores.
8. Implement the following memory allocation methods for fixed partition
   a) First fit b) Worst fit c) Best fit
9. Simulate the following page replacement algorithms
   a) FIFO b) LRU c) LFU
10. Simulate Paging Technique of memory management.
11. Implement Bankers Algorithm for Dead Lock avoidance and prevention
12. Simulate the following file allocation strategies
    a) Sequential b) Indexed c) Linked
13. Download and install nachos operating system and experiment with it

Sample Experiments in Software Engineering:

1) Perform the following, for the following experiments:
   i. Do the Requirement Analysis and Prepare SRS
   ii. Draw E-R diagrams, DFD, CFD and structured charts for the project.

a. Course Registration System
b. Students Marks Analyzing System

c. Online Ticket Reservation System
d. Stock Maintenance

2) Consider any application, using COCOMO model, estimate the effort.
3) Consider any application, Calculate effort using FP oriented estimation model.
4) Draw the UML Diagrams for the problem a, b, c, d.
5) Design the test cases for e-Commerce application (Flipcart, Amazon)
6) Design the test cases for a Mobile Application (Consider any example from Appstore)
7) Design and Implement ATM system through UML Diagrams.

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II Year II Semester

L	T	P	C
0	0	3	1.5

DATABASE MANAGEMENT SYSTEMS LAB

Course Objectives:

This Course will enable students to

- Populate and query a database using SQL DDL/DML Commands
- Declare and enforce integrity constraints on a database
- Writing Queries using advanced concepts of SQL
- Programming PL/SQL including procedures, functions, cursors and triggers

Experiments covering the topics:

- DDL, DML, DCL commands
- Queries, nested queries, built-in functions,
- PL/SQL programming- control structures
- Procedures, Functions, Cursors, Triggers,
- Database connectivity- ODBC/JDBC

Sample Experiments:

1. Creation, altering and droping of tables and inserting rows into a table (use constraints while creating tables) examples using SELECT command.
2. Queries (along with sub Queries) using ANY, ALL, IN, EXISTS, NOTEXISTS, UNION, INTERSET, Constraints. Example:- Select the roll number and name of the student who secured fourth rank in the class.
3. Queries using Aggregate functions (COUNT, SUM, AVG, MAX and MIN), GROUP BY, HAVING and Creation and dropping of Views.
4. Queries using Conversion functions (to_char, to_number and to_date), string functions (Concatenation, lpad, rpad, ltrim, rtrim, lower, upper, initcap, length, substr and instr), date functions (Sysdate, next_day, add_months, last_day, months_between, least, greatest, trunc, round, to_char, to_date).
5.
   i. Create a simple PL/SQL program which includes declaration section, executable section and exception – Handling section (Ex. Student marks can be selected from the table and printed for those who secured first class and an exception can be raised if no records were found)
   ii. Insert data into student table and use COMMIT, ROLLBACK and SAVEPOINT in PL/SQL block.
6. Develop a program that includes the features NESTED IF, CASE and CASE expression. The program can be extended using the NULLIF and COALESCE functions.
7. Program development using WHILE LOOPS, numeric FOR LOOPS, nested loops using ERROR Handling, BUILT –IN Exceptions, USE defined Exceptions, RAISE- APPLICATION ERROR.
8. Programs development using creation of procedures, passing parameters IN and OUT of PROCEDURES.
9. Program development using creation of stored functions, invoke functions in SQLStatements and write complex functions.
10. Develop programs using features parameters in a CURSOR, FOR UPDATE CURSOR, WHERE CURRENT of clause and CURSOR variables.
11. Develop Programs using BEFORE and AFTER Triggers, Row and StatementTriggers and INSTEAD OF Triggers
12. Create a table and perform the search operation on table using indexing and non-indexing techniques.
13. Write a Java program that connects to a database using JDBC
14. Write a Java program to connect to a database using JDBC and insert values into it
15. Write a Java program to connect to a database using JDBC and delete values from it

Text Books/Suggested Reading:

1. Oracle: The Complete Reference by Oracle Press
2. Nilesh Shah, "Database Systems Using Oracle", PHI, 2007
3. Rick F Vander Lans, "Introduction to SQL", Fourth Edition, Pearson Education, 2007

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DEPARTMENT OF INFORMATION TECHNOLOGY

II Year II Semester

L	T	P	C
0	1	2	2

PYTHON WITH DJANGO
(SKILL ENHANCEMENT COURSE)

Course Objectives:

The main objectives of the course are to

- Design and build static as well as dynamic web pages and interactive web-basedapplications
- Web development using Django framework.
- Analyze and create functional website in Django and deploy Django Web Applicationon Cloud

UNIT-I : Python libraries for web development :

Build static web pages using HTML 5 elements, Apply JavaScript to embed programming interface for web pages and also to perform Client side validations, Collections-Container datatypes, Tkinter-GUI applications, Requests-HTTP requests, BeautifulSoup4-web scraping, Scrapy, Zappa, Dash, CherryPy, Turbo Gears, Flask, Web2Py, Bottle, Falcon, Cubic Web, Quixote, Pyramid.

Sample Experiments:

1. Design static webpage using HTML 5 elements like Paragraph Element, Division and Span Elements, List Element, Link Element and Creating Table Elements, Table Elements : Colspan/ Rowspan Attributes, border, cell spacing, cell padding attributes.
2. Write a JavaScript program to find the area of a circle using radius (var and let - reassign and observe the difference with var and let) and PI (const).
3. Write a JavaScript program to Validate the user by creating a login module: (i) Create a validate method with username and password as arguments. (ii) If the username and password are equal it will return "Login Successful" else "Login Fail".
4. Write a Python GUI program to import Tkinter package and create a window. Set itstitle and add a label to the window.
5. Write a Python program that designs a simple login form with labels and Entrywidgets, arranging them in a grid using the Grid geometry manager.
6. Write a program using BeautifulSoup4 library for web scraping for a given URL
7. Develop a sample Hello World page using Flask framework
8. Develop a sample web page using CherryPy / Web2Py / Bottle Framework

UNIT-II: Introduction to Django Framework

Understanding Django environment, Features of Django and Django architecture, MVC and MTV, Urls and Views, Mapping the views to URLs, Django Template, Template inheritance Django Models, Creating model for site, Converting the model into a table, Fields in Models, Integrating Bootstrap into Django, Creating tables, Creating grids, Creating carousels.

Sample Experiments:

1. Create a Sample "Hello World" Application using Django
2. Create a Login and Registration Page using MVC architecture in Django Framework
3. Create a sample page in Django by integrating BootStrap.
4. Create an application with Tables, grids in Django
5. Create a Django App with Carousels feature.

UNIT-III : Integrating Accounts & Authentication on Django

Introduction to Django Authentication System, Security Problem &Solution with Django Creating Registration Form using Django, Adding Email Field in Forms, Configuring email settings, Sending emails with Django, Adding Grid Layout On Registration Page, Adding Page Restrictions, Login Functionality Test and Logout.

Sample Experiments:

1. Create a registration page using Authentication System
2. Create an application in Django to send emails using email settings and Grid Layout
3. Create an application in Django using page restriction / authentication with Login and Logout Functionality
4. Create a sample form using Django Forms

UNIT-IV: Connecting SQLite with Django

DatabaseMigrations, FetchDataFromDatabase, DisplayingDataOnTemplates, AddingCondition OnData, Sending data from url to view, Sending data from view to template, Saving objectsinto database, Sorting objects, Filtering objects, Deleting objects, Difference between sessionand cookie, Creating sessions and cookies in Django.

Sample Experiments:

1. Create an app in Django which fetches data from database and show as list and alsosave objects in database
2. Create an app in Django for performing CRUD operations on records in a database
3. Create an app in Django which uses session management and cookies to store andmanage user sessions.

UNIT-V: Deploying Django Web Application on Cloud

Creating a functional website in Django, Four Important Pillars to Deploy, registering on Heroku and GitHub, Push project from Local System to GitHub, working with Django Heroku, Working with StaticRoot, Handling WSGI with gunicorn, setting up Database & adding users.

Sample Experiments:

1. Create a website in Django with login, and registration page.
2. Register on GitHub, and Heroku and deploy the website on Heroku with all thefunctionalities developed.
3. Configure Django to handle static files.

Text books:

1. Martin C.Brown, "Python: The Complete Reference Paper back", 4th Edition 2018,McGraw Hill Education.
2. Reema Thareja, "Python Programming: Using Problem Solving Approach", 3rdEdition 2017, Oxford.
3. Daniel Rubio, Apress, "Beginning Django Web Application Development andDeployment with Python", 2nd Edition 2017,Apress.

Reference Books:

1. Tom Aratyn, "Building Django 2.0 Web Applications: Create enterprise-grade, scalable Python web applications easily with Django 2.0",2ndEdition 2018, Packt Publishing.
2. Harry Percival, "Test-Driven Development with Python: Obey the Testing Goat: Using Django, Selenium and JavaScript",2nd Edition 2019, Kindle Edition.

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DEPARTMENT OF INFORMATION TECHNOLOGY

II Year II Semester

L	T	P	C
1	0	2	2

DESIGN THINKING & INNOVATION

Course Objectives: The objectives of the course are to

- Bring awareness on innovative design and new product development.
- Explain the basics of design thinking.
- Familiarize the role of reverse engineering in product development.
- Train how to identify the needs of society and convert into demand.
- Introduce product planning and product development process.

UNIT – I Introduction to Design Thinking

Introduction to elements and principles of Design, basics of design-dot, line, shape, form as fundamental design components. Principles of design. Introduction to design thinking, history of Design Thinking, New materials in Industry.

UNIT - II Design Thinking Process

Design thinking process (empathize, analyze, idea & prototype), implementing the process in driving inventions, design thinking in social innovations. Tools of design thinking - person, costumer, journey map, brainstorming, product development

Activity: Every student presents their idea in three minutes, Every student can present design process in the form of flow diagram or flow chart etc. Every student should explain about product development.

UNIT - III Innovation

Art of innovation, Difference between innovation and creativity, role of creativity and innovation in organizations. Creativity to Innovation. Teams for innovation, Measuring the impact and value of creativity.

Activity: Debate on innovation and creativity, Flow and planning from idea to innovation, Debate on value-based innovation.

UNIT - IV Product Design

Problem formation, introduction to product design, Product strategies, Product value, Product planning, product specifications. Innovation towards product design Case studies.

Activity: Importance of modeling, how to set specifications, Explaining their own product design.

UNIT – V Design Thinking in Business Processes

Design Thinking applied in Business & Strategic Innovation, Design Thinking principles that redefine business – Business challenges: Growth, Predictability, Change, Maintaining Relevance, Extreme competition, Standardization. Design thinking to meet corporate needs. Design thinking for Startups.

Defining and testing Business Models and Business Cases. Developing & testing prototypes.

Activity: How to market our own product, about maintenance, Reliability and plan for startup.extbooks:

1. Tim Brown, Change by design, 1/e, Harper Bollins, 2009.
2. Idris Mootee, Design Thinking for Strategic Innovation, 1/e, Adams Media, 2014.

Reference Books:

1. David Lee, Design Thinking in the Classroom, Ulysses press, 2018.
2. Shrrutin N Shetty, Design the Future, 1/e, Norton Press, 2018.
3. William lidwell, Kritinaholden, &Jill butter, Universal principles of design, 2/e, Rockport Publishers, 2010.
4. Chesbrough.H, The era of open innovation, 2003.

Online Learning Resources:

- https://nptel.ac.in/courses/110/106/110106124/
- https://nptel.ac.in/courses/109/104/109104109/
- https://swayam.gov.in/nd1_noc19_mg60/preview
- https://onlinecourses.nptel.ac.in/noc22_de16/preview

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DEPARTMENT OF ELECTRONICSAND COMMUNICATION ENGINEERING

Minutes of the First Board of Studies Committee Meeting

I. AGENDA

1. Change of faculty in BoS.
2. To Discuss the curriculum structure of Second Year B.Tech UG Programme(MR23).
3. To Discuss the curriculum structure of Second Year M.Tech PG Programme (MR23).
4. Any other point by the permission of Chair

II. LISTOFMEMBERSATTENDED

The second Board of Studies Committee of the ECE Department, MLEW, Guntur, has been instituted with effect from 06-09-23 (for a period of 3 years), with thefollowing members.

1. **Dr.B.T.Krishna**, Professor& Head, ECE, JNTUK, **University Nominee**
2. **Dr.VakulaD**, Professor, ECE, NIT Warangal, Subject Expert **(OutsideParentUniversity)**
3. **Dr.K.SrinivasaRao**,Professor&HeadofMicroelectronicsResearch,KLUniversity Subject Expert **(Outside Parent University)**
4. **Dr.Sudha Rani Suram,** Scientist 'G', DLRL, Hyderabad, **Industry Expert**
5. **E.R.Rajeswari,** Hardware Developer, IBM, Bangalore, **Alumni**
6. Dr.Chiluka Ramesh, Professor, Faculty Member
7. Dr.K.Swetha, Professor, Faculty Member
8. Mr.B.T.Madhav, Associate Professor, Faculty Member
9. Mr.Ch.Rama Koteswara Rao, Associate Professor, Faculty Member
10. Mr.Y.BhaskaraRao, Associate Professor, Faculty Member
11. Mr.T.VenkataRao, Assistant Professor, Faculty Member
12. Ms.Sk.Gousya Begum, Assistant Professor, Faculty Member

The Second Meeting of the BoS Committee of the ECE Department was held on 6th July,24 through online mode via Zoom platform at 11:00 a.m.

III. Minutes of the Second BoS Meeting of ECE Department:

1. Dr.D.VijayaSaradhi, BoS Chair, extended a cordial welcome to all the members of the BoSfor ECE, for the II BoS Meeting of ECE Department and introduced all the members.
2. Dr.D.VijayaSaradhi, BoS Chair informed the change in member of BoS. Mr.Sk.zilani replaced with Mr.Ch.Rama koteswara Rao
3. Dr.D.Vijaya Saradhi explained the Course Structure and number of credits being covered invarious categories for IInd B.Tech I st and IInd Semesters.
4. Dr.D.Vijaya Saradhi detailed about the following subjects under II-I semester

   Probability theory and stochastic process
   Signals and Systems
   Electronic Devices and Circuits
   Switching Theory and Logic Design

5. Dr.D.Vijaya Saradhi detailed about the following labs and list of experiments under II-I semester

   Electronic Devices and Circuits Lab
   Switching Theory and Logic Design Lab
   Data Structures using Python

6. Dr.D.Vijaya Saradhi explained the detailed syllabus unit wise for II-Year I Semester subjects PTSP, S&S, EDC and STLD
7. Dr.D.Vijaya Saradhi detailed about the following subjects under II-II semester

   Linear Control Systems
   Electromagnetic Waves and Transmission Lines
   Electronic Circuit Analysis
   Analog Communications
   Design Thinking and Innovation

8. Dr.D.VijayaSaradhi detailed about the following labs and the list of experiments under II-II semester

   Electronic Circuit
   Analysis lab Signals
   and Systems Lab

9. Dr.D.VijayaSaradhi explained the detailed syllabus unit wise for II-Year, II Semester subjectsLCS, EMTL, ECA, AC, Design Thinking and Innovation.
10. The course structure and detailed syllabus for IIyear M.Tech in VLSI System & Design were proposed to the BOS.
11. The BOS Committee made constructive suggestions regarding the UG (II-Year B.Tech) Course Structure & Syllabus.
12. The BOS Committee made constructive suggestions regarding the PG (M.Tech)Course Structure& Syllabus.

13. After lengthy deliberations and progressive discussions, all the Members of the BoS for ECE have unanimously approved:
    a) The II Year First and Second Semester Course Structure for ECE.
    b) The II Year First and Second Semester Course Structure for VLSI System Design,
    c) The Course Contents and Syllabus of First Year for M.Tech. Programme in VLSI System Design.
    d) The BoS Committee formally authorized the BoS Chair of ECE Department, to include any minor modifications or corrections needed for the UG and PG Course Structures and Syllabus at later dates, if approved by the Academic Council.

I. Signatures of Members Present:

S.No.	Name of the Member	Designation and Address	Position	Signature
1	Dr.D.Vijaya Saradhi	Professor	Chairperson	
2	Dr.B.T.Krishna	Professor, ECE UCET,JNTUK	University Nominee	
3	Dr.Vakula.D	Professor, ECE NIT, Warangal	Subject expert (Outside the Parent University)	
4	Dr.K.Srinivasa Rao	Professor, ECE KL University, Guntur	Subject expert (Outside the Parent University)	
5	Dr.Sudha Rani Suram	Scientist-G DLRL,HYD	Industry Expert	
6	Ms.E Raja Rajeswari	VLSI Hardware Developer IBM, Bangalore	Alumni	E.Rajarajeswari
7	Dr.Chiluka Ramesh	Professor	Internal Faculty Member	
8	Dr.K.Swetha	Professor	Internal Faculty Member	
9	Mr.B.T.Madhav	Associate Professor	Internal Faculty Member	
10	Mr.Ch.Rama Koteswarar Rao	Associate Professor	Internal Faculty Member	
11	Mr.Y.Bhaskara Rao	Associate Professor	Internal Faculty Member	
12	Mr.T.Venkata Rao	Assistant Professor	Internal Faculty Member	
13	Ms.Sk.Gousya Begum	Assistant Professor	Internal Faculty Member	

Chairman – BoS
Dept of ECE

HOD
Department of
Electronics & Communication Engineering
Malineni Lakshmaiah Women's Engineering College
Pulladigunta, GUNTUR-522017

MALINENI LAKSHMAIAHWOMEN'S ENGINEERING COLLEGE (AUTONOMOUS)

Guntur-522 017, Andhra Pradesh.

DEPARTMENT OF ARTIFICIAL INTELLIGENCE & MANCHINE LEARNING

Minutes of Meeting

The BoS Meeting for B.Tech CSE-AIML Program was conducted on 02-07-2024 in Virtual Mode.

The Following members have attended the meeting.

S.No	Name & Designation	Members	Signature
1	Dr.D.Ravikiran, Professor & HOD, CSE-AIML	Chairman	
2	Dr.N.Rama Krishnaiah, Professor in CSE, UCEK, JNTUK	University Nominee	
3	Dr.V.Pavani Professor in CSE VNITSW, Guntur.	Subject expert from outside the parent University	
4	Dr. M.Vasumathi Devi Professor in CSE VNITSW, Guntur.	Subject expert from outside the parent University	
5	Mr. Anjaneyulu Abburi	Industry expert	
6	K.Sirisha	Faculty member	

In the beginning of the meeting the Chairman of the Committee, **Dr.D.RAVIKIRAN** welcomed all the Internal BoS members and external members and gave briefing about the course Structure designed by JNTUK for ***B.Tech*-CSE-*AI&ML*** & **M.Tech(AI)** Courses.

The meeting with presentation on proposed curriculum was presented by the chairman of the BoS committee.

General Comments:

1. **Dr.N.Rama Krishnaiah**, University Nominee, suggested to add additional text books and Online references for oops through JAVA lab of II B.Tech I semester and machine learning lab of II B.Tech II semester.
2. The Subject Expert, **Dr.V.Pavani**, recommended adding additional experiments for labs.
3. The external subject experts named **Dr .M.Vasumathi Devi** told to follow the bloom's taxonomy levels to prepare Course outcomes.

4. For Environmental Science we are following same syllabus Prescribed by the University.
5. No Modifications has been made to the **M.Tech(AI) Syllabus.**

Curriculum Justification:

By following recommendations of Subject experts, text books and online resources for OOPS through JAVA lab of II B.Tech I semester and Machine Learning Lab of II B.Tech II semester were added.

The following resolutions were approved :

SNO	Name Of The Subject	YEAR/ SEM	List of Text Books added as per Experts Suggestions
1	Object Oriented Programming Through Java Lab	II-I	**Reference Book(s)** 1. Java: A Beginner's Guide by Herbert Schildt 2. Head First Java by Kathy Sierra and Bert Bates 3. The Complete Reference Java 2 - Patrick Naughton & Hebert Schildt, 3rd Edition, TMH **Online Learning Resources:** 1. https://www.oracle.com/technetwork/java/javase/overview/ index.html. 2. https://www.oracle.com/technetwork/java/javase/ downloads/index.html). 3. https://docs.oracle.com/javase/tutorial/.
2	Machine Learning Lab	II-II	**List of Text Books** 1. Tom M. Mitchell, Machine Learning, India Edition 2013, McGraw Hill Education. **List of Reference Books** 1. Trevor Hastie, Robert Tibshirani, Jerome Friedman, h The Elements of Statistical Learning, 2nd edition, springer series in statistics. 2. Ethem Alpaydın, Introduction to machine learning, second edition, MIT press. **List of URLs, Text Books, Notes, Multimedia Content, etc** 1. https://medium.com/ml-research-lab/machine-learning-algorithm-overview 2. https://www.analyticsvidhya.com/blog/2017/09/common-machine-learning-lgorithms/

Chairman-BoS
Department of CSE-AIML

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DEPARTMENT OF ARTIFICIAL INTELLIGENCE & MANCHINE LEARNING

R23-IInd YEAR COURSE STRUCTURE & SYLLABUS

B. Tech.– II Year I Semester

S.No.	Category	Course Code	Title	L	T	P	Credits
1	BS&H	23BS21T01	Discrete Mathematics & Graph Theory	3	0	0	3
2	BS&H	23HM21T01	Universal human values – understanding harmony and Ethical human conduct	2	1	0	3
3	Engineering Science	23ES21T02	Artificial Intelligence	3	0	0	3
4	Professional Core	23CS21T01	Advanced Data Structures & Algorithms Analysis	3	0	0	3
5	Professional Core	23CS21T02	Object Oriented Programming Through Java	3	0	0	3
6	Professional Core	23CS21L01	Advanced Data Structures and Algorithms Lab	0	0	3	1.5
7	Professional Core	23CS21L02	Object Oriented Programming Through Java Lab	0	0	3	1.5
8	Skill Enhancement course	23CS21S01	Python programming	0	1	2	2
9	Audit Course	23BS21T01	Environmental Science	2	0	0	-
			Total	**16**	**2**	**8**	**20**

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R23-IInd YEAR COURSE STRUCTURE & SYLLABUS

B. Tech.– II Year II Semester

S.No.	Category	Course Code	Title	L	T	P	Credits
1	Management Course- I	23HM22T02	Optimization Techniques	2	0	0	2
2	Engineering Science/ Basic Science	23BS22T01	Probability & Statistics	3	0	0	3
3	Professional Core	23AM22T01	Machine Learning	3	0	0	3
4	Professional Core	23CS22T02	Database Management Systems	3	0	0	3
5	Professional Core	23AM22T01	Digital Logic & Computer Organization	3	0	0	3
6	Professional Core	23AM22L01	Machine Learning Lab	0	0	3	1.5
7	Professional Core	23CS22L02	Database Management Systems Lab	0	0	3	1.5
8	Skill Enhancement course	23CS22S01	Full Stack development-1	0	1	2	2
9	BS&H	23BS22L01	Design Thinking &Innovation	1	0	2	2
		Total		**15**	**1**	**12**	**21**
		Mandatory Community Service Project Internship of 08weeks duration during summer vacation					

1.

2. M.V.

3. V. Pavani

4.

5. K. Sirisha

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II Year – I Sem		L	T	P	C
		3	0	0	3
ARTIFICIAL INTELLIGENCE					

Pre-requisite:

1. Knowledge in Computer Programming.
2. A course on "Mathematical Foundations of Computer Science".
3. Background in linear algebra, data structures and algorithms, and probability.

Course Objectives:

1. The student should be made to study the concepts of Artificial Intelligence.
2. The student should be made to learn the methods of solving problems using Artificial Intelligence.
3. The student should be made to introduce the concepts of Expert Systems.
4. To understand the applications of AI, namely game playing, theorem proving, and machine learning.
5. To learn different knowledge representation techniques

UNIT – I: Introduction:

AI problems, foundation of AI and history of AI intelligent agents: Agents and Environments, the concept of rationality, the nature of environments, structure of agents, problem solving agents, problem formulation.

UNIT – II: Searching:

Searching for solutions, uniformed search strategies – Breadth first search, depth first Search. Search with partial information (Heuristic search) Hill climbing, A* ,AO* Algorithms, Problem reduction, Game Playing-Adversial search, Games, mini-max algorithm, optimal decisions in multiplayer games, Problem in Game playing, Alpha-Beta pruning, Evaluation functions.

UNIT – III: Representation of Knowledge:

Knowledge representation issues, predicate logic- logic programming, semantic nets- frames and inheritance, constraint propagation, representing knowledge using rules, rules based deduction systems. Reasoning under uncertainty, review of probability, Bayes' probabilistic interferences and dempstershafer theory.

V. Pavani
M.V.

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UNIT – IV Logic concepts:

First order logic. Inference in first order logic, propositional vs. first order inference, unification & lifts forward chaining, Backward chaining, Resolution, Learning from observation Inductive learning, Decision trees, Explanation based learning, Statistical Learning methods, Reinforcement Learning.

UNIT – V Expert Systems:

Architecture of expert systems, Roles of expert systems - Knowledge Acquisition Meta knowledge Heuristics. Typical expert systems - MYCIN, DART, XCON: Expert systems shells.`

Textbooks:

1. S. Russel and P. Norvig, "Artificial Intelligence - A Modern Approach", Second Edition, Pearson Education.
2. Kevin Night and Elaine Rich, Nair B., "Artificial Intelligence (SIE)", Mc Graw Hill.

Reference Books:

1. David Poole, Alan Mackworth, Randy Goebel," Computational Intelligence: a logical approach", Oxford University Press.
2. G. Luger, "Artificial Intelligence: Structures and Strategies for complex problem solving", Fourth Edition, Pearson Education.
3. J. Nilsson, "Artificial Intelligence: A new Synthesis", Elsevier Publishers.
4. Artificial Intelligence, Saroj Kaushik, CENGAGE Learning.

Online Learning Resources:

1. https://ai.google/
2. https://swayam.gov.in/nd1_noc19_me71/preview

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II Year – I Sem		L	T	P	C
		3	0	0	3

ADVANCED DATA STRUCTURES & ALGORITHM ANALYSIS

Course Objectives:
The main objectives of the course is to

- provide knowledge on advance data structures frequently used in Computer Science domain
- Develop skills in algorithm design techniques popularly used
- Understand the use of various data structures in the algorithm design

UNIT – I:

Introduction to Algorithm Analysis, Space and Time Complexity analysis, Asymptotic Notations.
AVL Trees – Creation, Insertion, Deletion operations and Applications
B-Trees – Creation, Insertion, Deletion operations and Applications

UNIT – II:

Heap Trees (Priority Queues) – Min and Max Heaps, Operations and Applications
Graphs – Terminology, Representations, Basic Search and Traversals, Connected Components and Biconnected Components, applications
Divide and Conquer: The General Method, Quick Sort, Merge Sort, Strassen's matrix multiplication, Convex Hull

UNIT – III:

Greedy Method: General Method, Job Sequencing with deadlines, Knapsack Problem, Minimum cost spanning trees, Single Source Shortest Paths
Dynamic Programming: General Method, All pairs shortest paths, Single Source Shortest Paths – General Weights (Bellman Ford Algorithm), Optimal Binary Search Trees, 0/1 Knapsack, String Editing, Travelling Salesperson problem

UNIT – IV:

Backtracking: General Method, 8-Queens Problem, Sum of Subsets problem, Graph Coloring, 0/1 Knapsack Problem

Branch and Bound: The General Method, 0/1 Knapsack Problem, Travelling Salesperson problem

UNIT – V:

NP Hard and NP Complete Problems: Basic Concepts, Cook's theorem
NP Hard Graph Problems: Clique Decision Problem (CDP), Chromatic Number Decision Problem (CNDP), Traveling Salesperson Decision Problem (TSP)
NP Hard Scheduling Problems: Scheduling Identical Processors, Job Shop Scheduling

Textbooks:

1. Fundamentals of Data Structures in C++, Horowitz, Ellis; Sahni, Sartaj; Mehta, Dinesh 2nd Edition Universities Press
2. Computer Algorithms/C++ Ellis Horowitz, Sartaj Sahni, Sanguthevar Rajasekaran 2nd Edition University Press

Reference Books:

1. Data Structures and program design in C, Robert Kruse, Pearson Education Asia
2. An introduction to Data Structures with applications, Trembley & Sorenson, McGrawHill
3. The Art of Computer Programming, Vol.1: Fundamental Algorithms, Donald E Knuth, Addison-Wesley, 1997.
4. Data Structures using C & C++: Langsam, Augenstein & Tanenbaum, Pearson, 1995
5. Algorithms + Data Structures & Programs:, N.Wirth, PHI
6. Fundamentals of Data Structures in C++: Horowitz Sahni & Mehta, Galgottia Pub.
7. Data structures in Java:, Thomas Standish, Pearson Education Asia

Online Learning Resources:

1. https://www.tutorialspoint.com/advanced_data_structures/index.asp
2. http://peterindia.net/Algorithms.html
3. Abdul Bari, 1. Introduction to Algorithms (youtube.com)

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II Year – I Sem		L	T	P	C
		3	0	0	3
OBJECT ORIENTED PROGRAMMING THROUGH JAVA					

Course Objectives:

The learning objectives of this course are to:

- Identify Java language components and how they work together in applications
- Learn the fundamentals of object-oriented programming in Java, including defining classes, invoking methods, using class libraries.
- Learn how to extend Java classes with inheritance and dynamic binding and how to use exception handling in Java applications
- Understand how to design applications with threads in Java
- Understand how to use Java APIs for program development

UNIT I: Object Oriented Programming: Basic concepts, Principles, Program Structure in Java: Introduction, Writing Simple Java Programs, Elements or Tokens in Java Programs, Java Statements, Command Line Arguments, User Input to Programs, Escape Sequences Comments, Programming Style.

Data Types, Variables, and Operators : Introduction, Data Types in Java, Declaration of Variables, Data Types, Type Casting, Scope of Variable Identifier, Literal Constants, Symbolic Constants, Formatted Output with printf() Method, Static Variables and Methods, Attribute Final, Introduction to Operators, Precedence and Associativity of Operators, Assignment Operator (=), Basic Arithmetic Operators, Increment (++) and Decrement (- -) Operators, Ternary Operator, Relational Operators, Boolean Logical Operators, Bitwise Logical operators.

Control Statements: Introduction, if Expression, Nested if Expressions, if-else Expressions, Ternary Operator?:, Switch Statement, Iteration Statements, while Expression, do-while Loop, for Loop, Nested for Loop, For-Each for Loop, Break Statement, Continue Statement.

UNIT II: Classes and Objects: Introduction, Class Declaration and Modifiers, Class Members, Declaration of Class Objects, Assigning One Object to Another, Access Control for Class Members, Accessing Private Members of Class, Constructor Methods for Class, Overloaded Constructor Methods, Nested Classes, Final Class and Methods, Passing Arguments by Value and by Reference, Keyword this.

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Methods: Introduction, Defining Methods, Overloaded Methods, Overloaded Constructor Methods, Class Objects as Parameters in Methods, Access Control, Recursive Methods, Nesting of Methods, Overriding Methods, Attributes Final and Static.

UNIT III: Arrays: Introduction, Declaration and Initialization of Arrays, Storage of Array in Computer Memory, Accessing Elements of Arrays, Operations on Array Elements, Assigning Array to Another Array, Dynamic Change of Array Size, Sorting of Arrays, Search for Values in Arrays, Class Arrays, Two-dimensional Arrays, Arrays of Varying Lengths, Three-dimensional Arrays, Arrays as Vectors.

Inheritance: Introduction, Process of Inheritance, Types of Inheritances, Universal Super Class-Object Class, Inhibiting Inheritance of Class Using Final, Access Control and Inheritance, Multilevel Inheritance, Application of Keyword Super, Constructor Method and Inheritance, Method Overriding, Dynamic Method Dispatch, Abstract Classes, Interfaces and Inheritance.

Interfaces: Introduction, Declaration of Interface, Implementation of Interface, Multiple Interfaces, Nested Interfaces, Inheritance of Interfaces, Default Methods in Interfaces, Static Methods in Interface, Functional Interfaces, Annotations.

UNIT IV: Packages and Java Library: Introduction, Defining Package, Importing Packages and Classes into Programs, Path and Class Path, Access Control, Packages in Java SE, Java.lang Package and its Classes, Class Object, Enumeration, class Math, Wrapper Classes, Auto-boxing and Auto-unboxing, Java util Classes and Interfaces, Formatter Class, Random Class, Time Package, Class Instant (java.time.Instant), Formatting for Date/Time in Java, Temporal Adjusters Class, Temporal Adjusters Class.

Exception Handling: Introduction, Hierarchy of Standard Exception Classes, Keywords throws and throw, try, catch, and finally Blocks, Multiple Catch Clauses, Class Throwable, Unchecked Exceptions, Checked Exceptions.

Java I/O and File: Java I/O API, standard I/O streams, types, Byte streams, Character streams, Scanner class, Files in Java(Text Book 2)

UNIT V: String Handling in Java: Introduction, Interface Char Sequence, Class String, Methods for Extracting Characters from Strings, Comparison, Modifying, Searching; Class String Buffer.

Multithreaded Programming: Introduction, Need for Multiple Threads Multithreaded Programming for Multi-core Processor, Thread Class, Main Thread-Creation of New Threads, Thread States, Thread Priority-Synchronization, Deadlock and Race Situations, Inter-thread Communication - Suspending, Resuming, and Stopping of Threads.

M.V.V.N.
V. Parani

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Java Database Connectivity: Introduction, JDBC Architecture, Installing MySQL and MySQL Connector/J, JDBC Environment Setup, Establishing JDBC Database Connections, ResultSet Interface

Java FX GUI: Java FX Scene Builder, Java FX App Window Structure, displaying text and image, event handling, laying out nodes in scene graph, mouse events (Text Book 3)

Text Books:

1. JAVA one step ahead, Anitha Seth, B.L.Juneja, Oxford.
2. Joy with JAVA, Fundamentals of Object Oriented Programming, DebasisSamanta, MonalisaSarma, Cambridge, 2023.
3. JAVA 9 for Programmers, Paul Deitel, Harvey Deitel, 4th Edition, Pearson.

References Books:

1. The complete Reference Java, 11thedition, Herbert Schildt,TMH
2. Introduction to Java programming, 7th Edition, Y Daniel Liang, Pearson

Online Resources:

1.https://nptel.ac.in/courses/106/105/106105191/
2.https://infyspringboard.onwingspan.com/web/en/app/toc/lex_auth_012880464547618 816347_shared/overview

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II Year – I Sem		L	T	P	C
		0	0	3	1.5
ADVANCED DATA STRUCTURES AND ALGORITHMS LAB					

Course Objectives:

The objectives of the course is to

- acquire practical skills in constructing and managing Data structures
- apply the popular algorithm design methods in problem-solving scenarios

Experiments covering the Topics:

- Operations on AVL trees, B-Trees, Heap Trees
- Graph Traversals
- Sorting techniques
- Minimum cost spanning trees
- Shortest path algorithms
- 0/1 Knapsack Problem
- Travelling Salesperson problem
- Optimal Binary Search Trees
- N-Queens Problem
- Job Sequencing

Sample Programs:

1. Construct an AVL tree for a given set of elements which are stored in a file. And implement insert and delete operation on the constructed tree. Write contents of tree into a new file using in-order.
2. Construct B-Tree an order of 5 with a set of 100 random elements stored in array. Implement searching, insertion and deletion operations.
3. Construct Min and Max Heap using arrays, delete any element and display the content of the Heap.
4. Implement BFT and DFT for given graph, when graph is represented by
   a) Adjacency Matrix b) Adjacency Lists
5. Write a program for finding the bi-connected components in a given graph.
6. Implement Quick sort and Merge sort and observe the execution time for various input sizes (Average, Worst and Best cases).
7. Compare the performance of Single Source Shortest Paths using Greedy method when the graph is represented by adjacency matrix and adjacency lists.

N. Pavani
M.V.L.D.

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8. Implement Job sequencing with deadlines using Greedy strategy.
9. Write a program to solve 0/1 Knapsack problem Using Dynamic Programming.
10. Implement N-Queens Problem Using Backtracking.
11. Use Backtracking strategy to solve 0/1 Knapsack problem.
12. Implement Travelling Sales Person problem using Branch and Bound approach.

Reference Books:

1. Fundamentals of Data Structures in C++, Horowitz Ellis, SahniSartaj, Mehta, Dinesh, 2ndEdition, Universities Press
2. Computer Algorithms/C++ Ellis Horowitz, SartajSahni, Sanguthevar Rajasekaran, 2ndEdition, University Press
3. Data Structures and program design in C, Robert Kruse, Pearson Education Asia
4. An introduction to Data Structures with applications, Trembley & Sorenson, McGraw Hill

Online Learning Resources:

1. http://cse01-iiith.vlabs.ac.in/
2. http://peterindia.net/Algorithms.html

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II Year – I Sem		L	T	P	C
		0	0	3	1.5
OBJECT-ORIENTED PROGRAMMING THROUGH JAVA LAB					

Course Objectives:
The aim of this course is to

- Practice object oriented programming in the Java programming language
- implement Classes, Objects, Methods, Inheritance, Exception, Runtime Polymorphism, User defined Exception handling mechanism
- Illustrate inheritance, Exception handling mechanism, JDBC connectivity
- Construct Threads, Event Handling, implement packages, Java FX GUI

Experiments covering the Topics:

- Object Oriented Programming fundamentals- data types, control structures
- Classes, methods, objects, Inheritance, polymorphism,
- Exception handling, Threads, Packages, Interfaces
- Files, I/O streams, JavaFX GUI

Sample Experiments:

Exercise – 1:

a) Write a JAVA program to display default value of all primitive data type of JAVA
b) Write a java program that display the roots of a quadratic equation ax2+bx=0. Calculate the discriminate D and basing on value of D, describe the nature of root.

Exercise - 2

a) Write a JAVA program to search for an element in a given list of elements using binary search mechanism.
b) Write a JAVA program to sort for an element in a given list of elements using bubble sort
c) Write a JAVA program using StringBuffer to delete, remove character.

M.V.V.N
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Exercise - 3

a) Write a JAVA program to implement class mechanism. Create a class, methods and invoke them inside main method.
b) Write a JAVA program implement method overloading.
c) Write a JAVA program to implement constructor.
d) Write a JAVA program to implement constructor overloading.

Exercise - 4

a) Write a JAVA program to implement Single Inheritance
b) Write a JAVA program to implement multi level Inheritance
c) Write a JAVA program for abstract class to find areas of different shapes

Exercise - 5

a) Write a JAVA program give example for "super" keyword.
b) Write a JAVA program to implement Interface. What kind of Inheritance can be achieved?
c) Write a JAVA program that implements Runtime polymorphism

Exercise - 6

a) Write a JAVA program that describes exception handling mechanism
b) Write a JAVA program Illustrating Multiple catch clauses
- Write a JAVA program for creation of Java Built-in Exceptions
- Write a JAVA program for creation of User Defined Exception

Exercise - 7

a) Write a JAVA program that creates threads by extending Thread class. First thread display "Good Morning "every 1 sec, the second thread displays "Hello "every 2 seconds and the third display "Welcome" every 3 seconds, (Repeat the same by implementing Runnable)
b) Write a program illustrating **is Alive** and **join ()**
c) Write a Program illustrating Daemon Threads.
d) Write a JAVA program Producer Consumer Problem

Exercise – 8

a) Write a JAVA program that import and use the user defined packages
b) Without writing any code, build a GUI that display text in label and image in an ImageView (use JavaFX)
c) Build a Tip Calculator app using several JavaFX components and learn how to



respond to user interactions with the GUI

Exercise – 9

a) Write a java program that connects to a database using JDBC
b) Write a java program to connect to a database using JDBC and insert values into it.
c) Write a java program to connect to a database using JDBC and delete values from it.

Reference Book(s)

1. Java: A Beginner's Guide by Herbert Schildt
2. Head First Java by Kathy Sierra and Bert Bates
3. The Complete Reference Java 2 - Patrick Naughton & Hebert Schildt, 3rd Edition, TMH

Online Learning Resources:

1. https://www.oracle.com/technetwork/java/javase/overview/index.html.
2. https://www.oracle.com/technetwork/java/javase/downloads/index.html).
3. https://docs.oracle.com/javase/tutorial/.

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II Year – I Sem		L	T	P	C
		0	1	2	2

PYTHON PROGRAMMING
(Skill Enhancement Course)

Course Objectives:

The main objectives of the course are to

- Introduce core programming concepts of Python programming language.
- Demonstrate about Python data structures like Lists, Tuples, Sets and dictionaries
- Implement Functions, Modules and Regular Expressions in Python Programming and to create practical and contemporary applications using these

UNTI-I: History of Python Programming Language, Thrust Areas of Python, Installing Anaconda Python Distribution, Installing and Using Jupyter Notebook.
Parts of Python Programming Language: Identifiers, Keywords, Statements and Expressions, Variables, Operators, Precedence and Associativity, Data Types, Indentation, Comments, Reading Input, Print Output, Type Conversions, the type () Function and Is Operator, Dynamic and Strongly Typed Language.
Control Flow Statements: if statement, if-else statement, if...elif...else, Nested if statement, while Loop, for Loop, continue and break Statements, Catching Exceptions Using try and except Statement.

Sample Experiments:

1. Write a program to find the largest element among three Numbers.
2. Write a Program to display all prime numbers within an interval
3. Write a program to swap two numbers without using a temporary variable.
4. Demonstrate the following Operators in Python with suitable examples.
   i) Arithmetic Operators ii) Relational Operators iii) Assignment Operators
   iv) Logical Operators v) Bit wise Operators vi) Ternary Operator
   vii) Membership Operators viii) Identity Operators
5. Write a program to add and multiply complex numbers
6. Write a program to print multiplication table of a given number.

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UNIT-II: Functions: Built-In Functions, Commonly Used Modules, Function Definition and Calling the function, return Statement and void Function, Scope and Lifetime of Variables, Default Parameters, Keyword Arguments, *args and **kwargs, Command Line Arguments.
Strings: Creating and Storing Strings, Basic String Operations, Accessing Characters in String by Index Number, String Slicing and Joining, String Methods, Formatting Strings.
Lists: Creating Lists, Basic List Operations, Indexing and Slicing in Lists, Built-In Functions Used on Lists, List Methods, del Statement.

Sample Experiments:

1. Write a program to define a function with multiple return values.
2. Write a program to define a function using default arguments.
3. Write a program to find the length of the string without using any library functions.
4. Write a program to check if the substring is present in a given string or not.
5. Write a program to perform the given operations on a list:
   i. Addition ii. Insertion iii. slicing
6. Write a program to perform any 5 built-in functions by taking any list.

UNIT-III: Dictionaries: Creating Dictionary, Accessing and Modifying key:value Pairs in Dictionaries, Built-In Functions Used on Dictionaries, Dictionary Methods, del Statement.
Tuples and Sets: Creating Tuples, Basic Tuple Operations, tuple() Function, Indexing and Slicing in Tuples, Built-In Functions Used on Tuples, Relation between Tuples and Lists, Relation between Tuples and Dictionaries, Using zip() Function, Sets, Set Methods, Frozenset.

Sample Experiments:

1. Write a program to create tuples (name, age, address, college) for at least two members and concatenate the tuples and print the concatenated tuples.
2. Write a program to count the number of vowels in a string (No control flow allowed).
3. Write a program to check if a given key exists in a dictionary or not.
4. Write a program to add a new key-value pair to an existing dictionary.
5. Write a program to sum all the items in a given dictionary.

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UNIT-IV:Files: Types of Files, Creating and Reading Text Data, File Methods to Read and Write Data, Reading and Writing Binary Files, Pickle Module, Reading and Writing CSV Files, Python os and os.path Modules.

Object-Oriented Programming: Classes and Objects, Creating Classes in Python, Creating Objects in Python, Constructor Method, Classes with Multiple Objects, Class Attributes Vs Data Attributes, Encapsulation, Inheritance, Polymorphism.

Sample Experiments:

1. Write a program to sort words in a file and put them in another file. The output file should have only lower-case words, so any upper-case words from source must be lowered.
2. Python program to print each line of a file in reverse order.
3. Python program to compute the number of characters, words and lines in a file.
4. Write a program to create, display, append, insert and reverse the order of the items in the array.
5. Write a program to add, transpose and multiply two matrices.
6. Write a Python program to create a class that represents a shape. Include methods to calculate its area and perimeter. Implement subclasses for different shapes like circle, triangle, and square.

UNIT-V: Introduction to Data Science: Functional Programming, JSON and XML in Python, NumPy with Python, Pandas.

Sample Experiments:

1. Python program to check whether a JSON string contains complex object or not.
2. Python Program to demonstrate NumPy arrays creation using array () function.
3. Python program to demonstrate use of ndim, shape, size, dtype.
4. Python program to demonstrate basic slicing, integer and Boolean indexing.
5. Python program to find min, max, sum, cumulative sum of array
6. Create a dictionary with at least five keys and each key represent value as a list where this list contains at least ten values and convert this dictionary as a pandas data frame and explore the data through the data frame as follows:
   a) Apply head () function to the pandas data frame
   b) Perform various data selection operations on Data Frame

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7. Select any two columns from the above data frame, and observe the change in one attribute with respect to other attribute with scatter and plot operations in matplotlib

Reference Books:

1. Gowrishankar S, Veena A., Introduction to Python Programming, CRC Press.
2. Python Programming, S Sridhar, J Indumathi, V M Hariharan, 2ndEdition, Pearson, 2024
3. Introduction to Programming Using Python, Y. Daniel Liang, Pearson.

Online Learning Resources/Virtual Labs:

1. https://www.coursera.org/learn/python-for-applied-data-science-ai
2. https://www.coursera.org/learn/python?specialization=python#syllabus

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II Year – II Sem		L	T	P	C
		3	0	0	3
MACHINE LEARNING					

Course Objectives:

The objectives of the course is to

- Define machine learning and its different types (supervised and unsupervised) and understand their applications.
- Apply supervised learning algorithms including decision trees and k-nearest neighbours (k-NN).
- Implement unsupervised learning techniques, such as K-means clustering.

UNIT-I: Introduction to Machine Learning:

Evolution of Machine Learning, Paradigms for ML, Learning by Rote, Learning by Induction, Reinforcement Learning, Types of Data, Matching, Stages in Machine Learning, Data Acquisition, Feature Engineering, Data Representation, Model Selection, Model Learning, Model Evaluation, Model Prediction, Search and Learning, Data Sets.

UNIT-II: Nearest Neighbor-Based Models:

Introduction to Proximity Measures, Distance Measures, Non-Metric Similarity Functions, Proximity Between Binary Patterns, Different Classification Algorithms Based on the Distance Measures, K-Nearest Neighbor Classifier, Radius Distance Nearest Neighbor Algorithm, KNN Regression, Performance of Classifiers, Performance of Regression Algorithms.

UNIT-III: Models Based on Decision Trees:

Decision Trees for Classification, Impurity Measures, Properties, Regression Based on Decision Trees, Bias–Variance Trade-off, Random Forests for Classification and Regression. The Bayes Classifier: Introduction to the Bayes Classifier, Bayes' Rule and Inference, The Bayes Classifier and its Optimality, Multi-Class Classification Class Conditional Independence and Naive Bayes Classifier (NBC)

UNIT-IV: Linear Discriminants for Machine Learning:

Introduction to Linear Discriminants, Linear Discriminants for Classification, Perceptron Classifier, Perceptron Learning Algorithm, Support Vector Machines, Linearly Non-Separable Case, Non-linear SVM, Kernel Trick, Logistic Regression, Linear Regression, Multi-Layer Perceptrons (MLPs), Backpropagation for Training an MLP.

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UNIT-V: Clustering:

Introduction to Clustering, Partitioning of Data, Matrix Factorization Clustering of Patterns, Divisive Clustering, Agglomerative Clustering, Partitional Clustering, K-Means Clustering, Soft Partitioning, Soft Clustering, Fuzzy C-Means Clustering, Rough Clustering, Rough K-Means Clustering Algorithm, Expectation Maximization-Based Clustering, Spectral Clustering.

Text Books:

1. "Machine Learning Theory and Practice", M N Murthy, V S Ananthanarayana, Universities Press (India), 2024.

Reference Books:

1. "Machine Learning", Tom M. Mitchell, McGraw-Hill Publication, 2017.
2. "Machine Learning in Action",Peter Harrington, DreamTech.
3. "Introduction to Data Mining", Pang-Ning Tan, Michel Stenbach, Vipin Kumar, 7th Edition, 2019.

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II Year – II Sem		L	T	P	C
		3	0	0	3
DATABASE MANAGEMENT SYSTEMS					

Course Objectives:
The main objectives of the course is to

- Introduce database management systems and to give a good formal foundation on the relational model of data and usage of Relational Algebra
- Introduce the concepts of basic SQL as a universal Database language
- Demonstrate the principles behind systematic database design approaches by covering conceptual design, logical design through normalization
- Provide an overview of physical design of a database system, by discussing Database indexing techniques and storage techniques

UNIT I: Introduction: Database system, Characteristics (Database Vs File System), Database Users, Advantages of Database systems, Database applications. Brief introduction of different Data Models; Concepts of Schema, Instance and data independence; Three tier schema architecture for data independence; Database system structure, environment, Centralized and Client Server architecture for the database.

Entity Relationship Model: Introduction, Representation of entities, attributes, entity set, relationship, relationship set, constraints, sub classes, super class, inheritance, specialization, generalization using ER Diagrams.

Unit II: **Relational Model**: Introduction to relational model, concepts of domain, attribute, tuple, relation, importance of null values, constraints (Domain, Key constraints, integrity constraints) and their importance, Relational Algebra, Relational Calculus. BASIC SQL: Simple Database schema, data types, table definitions (create, alter), different DML operations (insert, delete, update).

UNIT III: SQL: Basic SQL querying (select and project) using where clause, arithmetic & logical operations, SQL functions(Date and Time, Numeric, String conversion).Creating tables with relationship, implementation of key and integrity constraints, nested queries, sub queries, grouping, aggregation, ordering, implementation of different types of joins, view(updatable and non-updatable), relational set operations.

UNIT IV: Schema Refinement (Normalization): Purpose of Normalization or schema refinement, concept of functional dependency, normal forms based on functional dependency Lossless join and dependency preserving decomposition, (1NF, 2NF and 3 NF), concept of surrogate key, Boyce-Codd normal form(BCNF), MVD, Fourth normal form(4NF), Fifth Normal Form (5NF).

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UNIT V: Transaction Concept: Transaction State, ACID properties, Concurrent Executions, Serializability, Recoverability, Implementation of Isolation, Testing for Serializability, lock based, time stamp based, optimistic, concurrency protocols, Deadlocks, Failure Classification, Storage, Recovery and Atomicity, Recovery algorithm.
Introduction to Indexing Techniques: B+ Trees, operations on B+Trees, Hash Based Indexing:

Text Books:

1. Database Management Systems, 3rd edition, Raghurama Krishnan, Johannes Gehrke, TMH (For Chapters 2, 3, 4)
2. Database System Concepts, 5th edition, Silberschatz, Korth, Sudarsan,TMH (For Chapter 1 and Chapter 5)

Reference Books:

1. Introduction to Database Systems, 8th edition, C J Date, Pearson.
2. Database Management System, 6th edition, RamezElmasri, Shamkant B. Navathe, Pearson
3. Database Principles Fundamentals of Design Implementation and Management,Corlos Coronel, Steven Morris, Peter Robb, Cengage Learning.

Web-Resources:

1. https://nptel.ac.in/courses/106/105/106105175/
2. https://infyspringboard.onwingspan.com/web/en/app/toc/lex_auth_012758066672822022456_shared/overview

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II Year – II Sem		L	T	P	C
		3	0	0	3
DIGITAL LOGIC & COMPUTER ORGANIZATION					

Course Objectives:
The main objectives of the course is to
- provide students with a comprehensive understanding of digital logic design principles and computer organization fundamentals
- Describe memory hierarchy concepts
- Explain input/output (I/O) systems and their interaction with the CPU, memory, and peripheral devices

UNIT – I:
Data Representation: Binary Numbers, Fixed Point Representation. Floating Point Representation. Number base conversions, Octal and Hexadecimal Numbers, components, Signed binary numbers, Binary codes
Digital Logic Circuits-I: Basic Logic Functions, Logic gates, universal logic gates, Minimization of Logic expressions. K-Map Simplification, Combinational Circuits, Decoders, Multiplexers

UNIT – II:
Digital Logic Circuits-II: Sequential Circuits, Flip-Flops, Binary counters, Registers, Shift Registers, Ripple counters
Basic Structure of Computers: Computer Types, Functional units, Basic operational concepts, Bus structures, Software, Performance, multiprocessors and multi computers, Computer Generations, Von- Neumann Architecture

UNIT – III:
Computer Arithmetic : Addition and Subtraction of Signed Numbers, Design of Fast Adders, Multiplication of Positive Numbers, Signed-operand Multiplication, Fast Multiplication, Integer Division, Floating-Point Numbers and Operations
Processor Organization: Fundamental Concepts, Execution of a Complete Instruction, Multiple-Bus Organization, Hardwired Control and Multi programmed Control
UNIT – IV:
The Memory Organization: Basic Concepts, Semiconductor RAM Memories, Read-Only Memories, Speed, Size and Cost, Cache Memories, Performance Considerations, Virtual Memories, Memory Management Requirements, Secondary Storage
UNIT – V:
Input/Output Organization: Accessing I/O Devices, Interrupts, Processor Examples, Direct Memory Access, Buses, Interface Circuits, Standard I/O Interfaces

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Textbooks:

1. Computer Organization, Carl Hamacher, ZvonkoVranesic, SafwatZaky, 6th edition, McGraw Hill, 2023.
2. Digital Design, 6th Edition, M. Morris Mano, Pearson Education, 2018.
3. Computer Organization and Architecture, William Stallings, 11thEdition, Pearson, 2022.

Reference Books:

1. Computer Systems Architecture, M.Moris Mano, 3rdEdition, Pearson, 2017.
2. Computer Organization and Design, David A. Paterson, John L. Hennessy, Elsevier, 2004.
3. Fundamentals of Logic Design, Roth, 5thEdition, Thomson, 2003.

Online Learning Resources:

https://nptel.ac.in/courses/106/103/106103068/

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II Year – II Sem		L	T	P	C
		0	0	3	1.5
MACHINE LEARNING LAB					

Course Objectives:

1. To learn about computing central tendency measures and Data preprocessing techniques
2. To learn about classification and regression algorithms
3. To apply different clustering algorithms for a problem.

Software Required: Python/R/Weka

Lab should cover the concepts studied in the course work, sample list of Experiments:

1. Compute Central Tendency Measures: Mean, Median, Mode Measure of Dispersion: Variance, Standard Deviation.
2. Apply the following Pre-processing techniques for a given dataset.
   a. Attribute selection
   b. Handling Missing Values
   c. Discretization
   d. Elimination of Outliers
3. Apply KNN algorithm for classification and regression
4. Demonstrate decision tree algorithm for a classification problem and perform parameter tuning for better results
5. Demonstrate decision tree algorithm for a regression problem
6. Apply Random Forest algorithm for classification and regression
7. Demonstrate Naïve Bayes Classification algorithm.
8. Apply Support Vector algorithm for classification
9. Demonstrate simple linear regression algorithm for a regression problem
10. Apply Logistic regression algorithm for a classification problem
11. Demonstrate Multi-layer Perceptron algorithm for a classification problem
12. Implement the K-means algorithm and apply it to the data you selected. Evaluate performance by measuring the sum of the Euclidean distance of each example from its class center. Test the performance of the algorithm as a function of the parameters K.
13. Demonstrate the use of Fuzzy C-Means Clustering
14. Demonstrate the use of Expectation Maximization based clustering algorithm

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List of Text Books

1. Tom M. Mitchell, Machine Learning, India Edition 2013, McGraw Hill Education.

List of Reference Books

1. Trevor Hastie, Robert Tibshirani, Jerome Friedman, h The Elements of Statistical Learning, 2nd edition, springer series in statistics.
2. Ethem Alpaydın, Introduction to machine learning, second e tion, MIT press.

List of URLs, Text Books, Notes, Multimedia Content, etc

1. https://medium.com/ml-research-lab/machine-learning-algorithm-overview
2. https://www.analyticsvidhya.com/blog/2017/09/common-machine-learning-lgorithms/

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II Year – II Sem		L	T	P	C
		0	0	3	1.5
DATABASE MANAGEMENT SYSTEMS LAB					

Course Objectives:
This Course will enable students to

- Populate and query a database using SQL DDL/DML Commands
- Declare and enforce integrity constraints on a database
- Writing Queries using advanced concepts of SQL
- Programming PL/SQL including procedures, functions, cursors and triggers

Experiments covering the topics:

- DDL, DML, DCL commands
- Queries, nested queries, built-in functions,
- PL/SQL programming- control structures
- Procedures, Functions, Cursors, Triggers,
- Database connectivity- ODBC/JDBC

Sample Experiments:

1. Creation, altering and droping of tables and inserting rows into a table (use constraints while creating tables) examples using SELECT command.
2. Queries (along with sub Queries) using ANY, ALL, IN, EXISTS, NOTEXISTS, UNION, INTERSET, Constraints. Example:- Select the roll number and name of the student who secured fourth rank in the class.
3. Queries using Aggregate functions (COUNT, SUM, AVG, MAX and MIN), GROUP BY, HAVING and Creation and dropping of Views.
4. Queries using Conversion functions (to_char, to_number and to_date), string functions (Concatenation, lpad, rpad, ltrim, rtrim, lower, upper, initcap, length, substr and instr), date functions (Sysdate, next_day, add_months, last_day, months_between, least, greatest, trunc, round, to_char, to_date)
5.
   i. Create a simple PL/SQL program which includes declaration section, executable section and exception –Handling section (Ex. Student marks can be selected from the table and printed for those who secured first class and an exception can be raised if no records were found)
   ii. Insert data into student table and use COMMIT, ROLLBACK and SAVEPOINT in PL/SQL block.

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6. Develop a program that includes the features NESTED IF, CASE and CASE expression. The program can be extended using the NULLIF and COALESCE functions.
7. Program development using WHILE LOOPS, numeric FOR LOOPS, nested loops using ERROR Handling, BUILT -IN Exceptions, USE defined Exceptions, RAISEAPPLICATION ERROR.
8. Programs development using creation of procedures, passing parameters IN and OUT of PROCEDURES.
9. Program development using creation of stored functions, invoke functions in SQL Statements and write complex functions.
10. Develop programs using features parameters in a CURSOR, FOR UPDATE CURSOR, WHERE CURRENT of clause and CURSOR variables.
11. Develop Programs using BEFORE and AFTER Triggers, Row and Statement Triggers and INSTEAD OF Triggers
12. Create a table and perform the search operation on table using indexing and non-indexing techniques.
13. Write a Java program that connects to a database using JDBC
14. Write a Java program to connect to a database using JDBC and insert values into it
15. Write a Java program to connect to a database using JDBC and delete values from it

Text Books/Suggested Reading:

1. Oracle: The Complete Reference by Oracle Press
2. Nilesh Shah, "Database Systems Using Oracle", PHI, 2007
3. Rick F Vander Lans, "Introduction to SQL", Fourth Edition, Pearson Education, 2007

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II Year – II Sem		L	T	P	C
		0	1	2	2

FULL STACK DEVELOPMENT-1
(SKILL ENHANCEMENT COURSE)

Course Objectives:

The main objectives of the course are to

1. Make use of HTML elements and their attributes for designing static web pages
2. Build a web page by applying appropriate CSS styles to HTML elements
3. Experiment with JavaScript to develop dynamic web pages and validate forms

Experiments covering the Topics:

- Lists, Links and Images
- HTML Tables, Forms and Frames
- HTML 5 and Cascading Style Sheets, Types of CSS
- Selector forms
- CSS with Colo:, Background, Font, Text and CSS Box Model
- Applying JavaScript - internal and external, I/O, Type Conversion
- JavaScript Conditional Statements and Loops, Pre-defined and User-defined Objects
- JavaScript Functions and Events
- Node.js

Sample Experiments:

1. Lists, Links and Images

a. Write a HTML program, to explain the working of lists.
Note: It should have an ordered list, unordered list, nested lists and ordered list in an unordered list and definition lists.

b. Write a HTML program, to explain the working of hyperlinks using <a> tag and href, target Attributes.

c. Create a HTML document that has your image and your friend's image with a specific height and width. Also when clicked on the images it should navigate to their respective profiles.

d. Write a HTML program, in such a way that, rather than placing large images on a page, the preferred technique is to use thumbnails by setting the height and width parameters to something like to 100*100 pixels. Each thumbnail image is also a link to a full sized version of the image. Create an image gallery using this technique

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2. HTML Tables, Forms and Frames

- Write a HTML program, to explain the working of tables. (use tags: <table>, <tr>, <th>, <td> and attributes: border, rowspan, colspan)
- Write a HTML program, to explain the working of tables by preparing a timetable. (Note: Use <caption> tag to set the caption to the table & also use cell spacing, cell padding, border, rowspan, colspan etc.).
- Write a HTML program, to explain the working of forms by designing Registration form. (Note: Include text field, password field, number field, date of birth field, checkboxes, radio buttons, list boxes using <select>&<option> tags, <text area> and two buttons ie: submit and reset. Use tables to provide a better view).
- Write a HTML program, to explain the working of frames, such that page is to be divided into 3 parts on either direction. (Note: first frame image, second frame paragraph, third frame hyperlink. And also make sure of using "no frame" attribute such that frames to be fixed).

3. HTML 5 and Cascading Style Sheets, Types of CSS

a. Write a HTML program, that makes use of <article>, <aside>, <figure>, <figcaption>, <footer>, <header>, <main>, <nav>, <section>, , tags.
b. Write a HTML program, to embed audio and video into HTML web page.
c. Write a program to apply different types (or levels of styles or style specification formats) - inline, internal, external styles to HTML elements. (identify selector, property and value).

4. Selector forms

a. Write a program to apply different types of selector forms
- Simple selector (element, id, class, group, universal)
- Combinator selector (descendant, child, adjacent sibling, general sibling)
- Pseudo-class selector
- Pseudo-element selector
- Attribute selector

5. CSS with Color, Background, Font, Text and CSS Box Model

a. Write a program to demonstrate the various ways you can reference a color in CSS.
b. Write a CSS rule that places a background image halfway down the page, tilting it horizontally. The image should remain in place when the user scrolls up or down.
c. Write a program using the following terms related to CSS font and text:
i. font-size ii. font-weight iii. font-style
iv. text-decoration v. text-transformation vi. text-alignment
d. Write a program, to explain the importance of CSS Box model using
i. Content ii. Border iii. Margin iv. Padding

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6. Applying JavaScript - internal and external, I/O, Type Conversion

a. Write a program to embed internal and external JavaScript in a web page.
b. Write a program to explain the different ways for displaying output.
c. Write a program to explain the different ways for taking input.
d. Create a webpage which uses prompt dialogue box to ask a voter for his name and age. Display the information in table format along with either the voter can vote or not

7. JavaScript Pre-defined and User-defined Objects

a. Write a program using document object properties and methods.
b. Write a program using window object properties and methods.
c. Write a program using array object properties and methods.
d. Write a program using math object properties and methods.
e. Write a program using string object properties and methods.
f. Write a program using regex object properties and methods.
g. Write a program using date object properties and methods.
h. Write a program to explain user-defined object by using properties, methods, accessors, constructors and display.

8. JavaScript Conditional Statements and Loops

a. Write a program which asks the user to enter three integers, obtains the numbers from the user and outputs HTML text that displays the larger number followed by the words "LARGER NUMBER" in an information message dialog. If the numbers are equal, output HTML text as "EQUAL NUMBERS".
b. Write a program to display week days using switch case.
c. Write a program to print 1 to 10 numbers using for, while and do-while loops.
d. Write aprogram to print data in object using for-in, for-each and for-of loops
e. Develop a program to determine whether a given number is an 'ARMSTRONG NUMBER' or not. [Eg: 153 is an Armstrong number, since sum of the cube of the digits is equal to the number i.e.,13 + 53+ 33 = 153]
f. Write a program to display the denomination of the amount deposited in the bank in terms of 100's, 50's, 20's, 10's, 5's, 2's & 1's. (Eg: If deposited amount is Rs.163, the output should be 1-100's, 1-50's, 1- 10's, 1-2's & 1-1's)

9. Javascript Functions and Events

a. Design a appropriate function should be called to display
- Factorial of that number
- Fibonacci series up to that number
- Prime numbers up to that number
- Is it palindrome or not

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b. Design a HTML having a text box and four buttons named Factorial, Fibonacci, Prime, and Palindrome. When a button is pressed an appropriate function should be called to display
   4. Factorial of that number
   5. Fibonacci series up to that number
   6. Prime numbers up to that number
   7. Is it palindrome or not

c. Write a program to validate the following fields in a registration page
   i. Name (start with alphabet and followed by alphanumeric and the length should not be less than 6 characters)
   ii. Mobile (only numbers and length 10 digits)
   iii. E-mail (should contain format like xxxxxxx@xxxxxx.xxx)

Text Books:

1. Programming the World Wide Web, 7th Edition, Robet W Sebesta, Pearson, 2013.
2. Web Programming with HTML5, CSS and JavaScript, John Dean, Jones & Bartlett Learning, 2019 (Chapters 1-11).
3. Pro MERN Stack: Full Stack Web App Development with Mongo, Express, React, and Node, Vasan Subramanian, 2nd edition, APress, O'Reilly.

Web Links:

1. https://www.w3schools.com/html
2. https://www.w3schools.com/css
3. https://www.w3schools.com/js/
4. https://www.w3schools.com/nodejs
5. https://www.w3schools.com/typescript

R23

MALINENI LAKSHMAIAH WOMEN'S ENGINEERING COLLEGE
(AUTONOMOUS)
Guntur-522 017, Andhra Pradesh.
DEPARTMENT OF ARTIFICIAL INTELLIGENCE & MANCHINE LEARNING

II Year – II Sem		L	T	P	C
		1	0	2	2

DESIGN THINKING & INNOVATION

Course Objectives: The objectives of the course are to

- Bring awareness on innovative design and new product development.
- Explain the basics of design thinking.
- Familiarize the role of reverse engineering in product development.
- Train how to identify the needs of society and convert into demand.
- Introduce product planning and product development process.

UNIT – I Introduction to Design Thinking: Introduction to elements and principles of Design, basics of design-dot, line, shape, form as fundamental design components. Principles of design. Introduction to design thinking, history of Design Thinking, New materials in Industry.

UNIT - II Design Thinking Process: Design thinking process (empathize, analyze, idea & prototype), implementing the process in driving inventions, design thinking in social innovations. Tools of design thinking - person, costumer, journey map, brainstorming, product development Activity: Every student presents their idea in three minutes, Every student can present design process in the form of flow diagram or flow chart etc. Every student should explain about product development.

UNIT - III Innovation: Art of innovation, Difference between innovation and creativity, role of creativity and innovation in organizations. Creativity to Innovation. Teams for innovation, Measuring the impact and value of creativity.
Activity: Debate on innovation and creativity, Flow and planning from idea to innovation, Debate on value-based innovation.

UNIT - IV Product Design: Problem formation, introduction to product design, Product strategies, Product value, Product planning, product specifications. Innovation towards product design Case studies.
Activity: Importance of modeling, how to set specifications, Explaining their own product design.

UNIT – V Design Thinking in Business Processes: Design Thinking applied in Business & Strategic Innovation, Design Thinking principles that redefine business – Business challenges: Growth, Predictability, Change, Maintaining Relevance, Extreme competition, Standardization. Design thinking to meet corporate needs. Design thinking for Startups. Defining and testing Business Models and Business Cases.
Developing & testing prototypes.

M.V.S.R.
V. Rajani

R23

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Activity: How to market our own product, about maintenance, Reliability and plan for startup.

Textbooks:

1. Tim Brown, Change by design, 1/e, Harper Bollins, 2009.
2. Idris Mootee, Design Thinking for Strategic Innovation, 1/e, Adams Media, 2014.

Reference Books:

1. David Lee, Design Thinking in the Classroom, Ulysses press, 2018.
2. Shrrutin N Shetty, Design the Future, 1/e, Norton Press, 2018.
3. William lidwell, Kritinaholden, &Jill butter, Universal principles of design, 2/e, Rockport Publishers, 2010.
4. Chesbrough.H, The era of open innovation, 2003.

Online Learning Resources:

- https://nptel.ac.in/courses/110/106/110106124/
- https://nptel.ac.in/courses/109/104/109104109/
- https://swayam.gov.in/nd1_noc19_mg60/preview
- https://onlinecourses.nptel.ac.in/noc22_de16/preview

Course Outcomes:

COs	Statements	Blooms Level
CO1	Define the concepts related to design thinking.	L1
CO2	Explain the fundamentals of Design Thinking and innovation.	L2
CO3	Apply the design thinking techniques for solving problems in various sectors.	L3
CO4	Analyse to work in a multidisciplinary environment.	L4
CO5	Evaluate the value of creativity.	L5

M.V.L.R

N. Pavani

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Pulladigunta (Vil), Vatticherukuru (Md), Prathipadu Road, Guntur – 522 017 A.P.

Department of **CSE- Data Science**
Minutes of the Board of Studies (BoS) Meeting

The Second BoS meeting of CSE-Data Science Department was held virtually using the Zoom Online Meeting Platform on JULY 04, 2024, at 3.30 p.m.

Members Present:

S. No.	Members	Name & Designation	Status of Attendance	Signature
1	Chairperson	N Hari Krishna, Professor & HOD of CSE-DS	PRESENT	
2	University Nominee	Dr. MHM Krishna Prasad, Principal, Professor of CSE, UCEK, JNTU Kakinada Ph: 9989337589 Email:principal_jntucek@yahoo.com krishnaprasad.mhm@gmail.com	PRESENT	
3	Subject expert from outside the parent University	1. Dr.P.Radhika, Principal, Professor & HOD of CSE, Vignan's Nirula Institute of Technology and science for women, Guntur. Email: rspathuri@yahoo.com Ph: 9866222280	PRESENT	
		2. Dr. U. Naga Gopi Raju Professor CSE, Chalapathi Institute of Engineering and Technology, Lam, Guntur Email: gopi.raju524@gmail.com Ph:9492576518	PRESENT	
4	Representative from Industry	Mr. B. Jaya Krishna Sr.Developer, IBM, Hyderabad Email:jayabalineni@in.ibm.com Ph: 9989665975	PRESENT	
5	Member	Mr. I Phani Kumar, Asst.Prof., MLWEC	PRESENT	
7	Member	Ms.T. Madhavi Latha, Asst.Prof, MLWEC	PRESENT	
8	Member	Ms. K. Sirisha, Asst.Prof, MLWEC	PRESENT	
9	Member	Ms. Ch. Haritha, Asst.Prof,MLWEC	PRESENT	

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Meeting Agenda

Item No: 1

Discussion on Proposed Course Structure of II B.Tech. I semester and II Semester

Item No: 2

Discussion on Proposed Syllabus of Courses offered by the Dept. in II B.Tech. I semester and II Semester.

Item No: 3

Any Other Points raised by BoS Members with the permission of chair

Resolutions:

Item No: 1 - Discussion on the Proposed Course Structure of II B.Tech. I Sem and II Sem

At the onset, the Chairperson of BOS, **Prof. N. Hari Krishna** welcomed all the members and introduced internal BOS members to external BOS members. The meeting began with presentation Proposed Course Structure of II B.Tech. I semester and II Semester who are then asked to make any required changes. The suggested course structure is approved with no alterations.

Course Structure: II-B.Tech - I Semester for CSE-DS

S.No.	Category	Course Code	Title	L	T	P	Credits
1	BS&H	23BS21T01	Discrete Mathematics & Graph Theory	3	0	0	3
2	BS&H	23HM21T01	Universal human values – understanding harmony and Ethical human conduct	2	1	0	3
3	Engineering Science	23ES21T03	Introduction to Data Science	3	0	0	3
4	Professional Core	23CS21T01	Advanced Data Structures &Algorithms Analysis	3	0	0	3
5	Professional Core	23CS21T02	Object-Oriented Programming Through JAVA	3	0	0	3
6	Professional Core	23DS21L01	Data Science Lab	0	0	3	1.5
7	Professional Core	23CS21L02	Object-Oriented Programming Through JAVA Lab	0	0	3	1.5
8	Skill Enhancement course	23DS21S01	Python programming	0	1	2	2
9	Audit Course	23BS21T01	Environmental Science	2	0	0	-
	Total			**16**	**2**	**08**	**20**

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II-B.Tech - II Semester for CSE-DS

S.No.	Category	Course Code	Title	L	T	P	Credits
1	Management Course- I	23HM22T02	Optimization Techniques	2	0	0	2
2	Engineering Science/ Basic Science	23BS22T02	Statistical methods for Data science	3	0	0	3
3	Professional Core	23DS22T01	Data Engineering	3	0	0	3
4	Professional Core	23CS22T02	Database Management Systems	3	0	0	3
5	Professional Core	23DS22T02	Computer Organization and Architecture	3	0	0	3
7	Professional Core	23DS22L01	Data Engineering Lab	0	0	3	1.5
8	Professional Core	23CS22L02	DBMS Lab	0	0	3	1.5
9	Skill Enhancement course	23DS22S01	Exploratory Data Analysis with Python	0	1	2	2
10	BS&H	23BS22L01	Design Thinking &Innovation	1	0	2	2
	Total			**15**	**1**	**10**	**21**
	Mandatory Community Service Project Internship of 08 weeks duration during summer Vacation						

ItemNo : 2 - Discussion on Proposed Syllabus of Courses Offered by Department in II B.Tech. I semester and II Semester

Discussed about II B.Tech I Semester & II B.Tech II Semester subjects titled **Introduction to Data Science, Advanced Data Structures & Algorithm analysis and Object oriented Programming through JAVA, Data Science Lab, Oops**

Through Java Lab, Python Programming Lab and Environmental Science (Audit Course) for I semester, and Data Engineering, DBMS, Computer organization and Architecture, Data Engineering Lab, DBMS Lab, Exploratory Data Analysis with Python and Design Thinking & Innovation for II Semester syllabi. The course syllabus has been changed in accordance with the BOS members' recommendations, which are listed below.

Item No : 3

Suggestions on Course Syllabus by the BoS Members:

1. The JNTUK - R23 Course Structure and Syllabus was recommended by the University Nominee **Dr.M.H.M KRISHNA PRASAD**, along with the use of Python Programming Theory classes include as a Bridge Course
2. **Dr. P. Radhika**, Subject expert from outside parent university advised follow the JNTUK R23 course structure and syllabus and recommended to include python programming class as a tutorial.
3. **Mr. B. Jaya Krishna**, industry expert has been advised to extend some further lab trials.
4. **Dr. U. Naga Gopi Raju**, Subject expert from outside the parent University advised to develop one application from each lab.
5. The Environmental Science (Audit Course) syllabi same as JNTUK Syllabi. All the BoS members are approved it.

And the modified Course Syllabi is attached herewith.

Finally, Chairperson of BOS thanked all the members of their valuable inputs and active participation in the meeting.

Chairperson
BoS-CSE-DS, MLWEC

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Department of **CSE- Data Science**

B. Tech – II Year I Semester

S.No.	Category	Course Code	Title	L	T	P	Credits
1	BS&H	23BS21T01	Discrete Mathematics & Graph Theory	3	0	0	3
2	BS&H	23HM21T01	Universal human values – understanding harmony and Ethical human conduct	2	1	0	3
3	Engineering Science	23ES21T03	Introduction to Data Science	3	0	0	3
4	Professional Core	23CS21T01	Advanced Data Structures &Algorithms Analysis	3	0	0	3
5	Professional Core	23CS21T02	Object-Oriented Programming Through JAVA	3	0	0	3
6	Professional Core	23DS21L01	Data Science Lab	0	0	3	1.5
7	Professional Core	23CS21L02	Object-Oriented Programming Through JAVA Lab	0	0	3	1.5
8	Skill Enhancement course	23DS21S01	Python programming	0	1	2	2
9	Audit Course	23BS21T01	Environmental Science	2	0	0	-
	Total			**16**	**2**	**08**	**20**

Department of **CSE- Data Science**

B. Tech– II Year II Semester

S.No.	Category	Course Code	Title	L	T	P	Credits
1	Management Course- I	23HM22T02	Optimization Techniques	2	0	0	2
2	Engineering Science/ Basic Science	23BS22T02	Statistical methods for Data science	3	0	0	3
3	Professional Core	23DS22T01	Data Engineering	3	0	0	3
4	Professional Core	23CS22T02	Database Management Systems	3	0	0	3
5	Professional Core	23DS22T02	Computer Organization and Architecture	3	0	0	3
7	Professional Core	23DS22L01	Data Engineering Lab	0	0	3	1.5
8	Professional Core	23CS22L02	DBMS Lab	0	0	3	1.5
9	Skill Enhancement course	23DS22S01	Exploratory Data Analysis with Python	0	1	2	2
10	BS&H	23BS22L01	Design Thinking &Innovation	1	0	2	2
	Total			**15**	**1**	**10**	**21**
	Mandatory Community Service Project Internship of 08 weeks duration during summerVacation						

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II Year I Semester

L	T	P	C
3	0	0	3

INTRODUCTION TO DATA SCIENCE

COURSE OBJECTIVES: From the course the student will learn

1. Knowledge and expertise to become a data scientist.
2. Essential concepts of statistics and machine learning that are vital for data science;
3. Significance of exploratory data analysis (EDA) in data science.
4. Critically evaluate data visualizations presented on the dashboards
5. Suitability and limitations of tools and techniques related to data science process

UNIT I: Introduction to Data science, benefits and uses, facets of data, data science process in brief, big data ecosystem and data science

Data Science process: Overview, defining goals and creating project charter, retrieving data, cleansing, integrating and transforming data, exploratory analysis, model building, presenting findings and building applications on top of them

Unit II: Applications of machine learning in Data science, role of ML in DS, Python tools like sklearn, modelling process for feature engineering, model selection, validation and prediction, types of ML, semi-supervised learning

Handling large data: problems and general techniques for handling large data, programming tips for dealing large data, case studies on DS projects for predicting malicious URLs, for building recommender systems

UNIT III: NoSQL movement for handling Bigdata: Distributing data storage and processing with Hadoop framework, case study on risk assessment for loan sanctioning, ACID principle of relational databases, CAP theorem, base principle of NoSQL databases, types of NoSQL databases, case study on disease diagnosis and profiling

UNIT IV: Tools and Applications of Data Science: Introducing **Neo4j**for dealing with graph databases, graph query language **Cypher**, Applications graph databases, Python libraries like nltk and SQLite for handling Text mining and analytics, case study on classifying Reddit posts

UNIT V: Data Visualization and Prototype Application Development: Data Visualization options, Crossfilter, the JavaScript MapReduce library, Creating an interactive dashboard with dc.js, Dashboard development tools.

Applying the Data Science process for real world problem solving scenarios as a detailed case study.

Textbook:

1) Davy Cielen, Arno D.B.Meysman, and Mohamed Ali, "Introducing to Data Science using Python tools", Manning Publications Co, Dreamtech press, 2016
2) Prateek Gupta, "Data Science with Jupyter" BPB publishers, 2019 for basics

Reference Books:

1) Joel Grus, "Data Science From Scratch", OReilly, 2019
2) Doing Data Science: Straight Talk From The Frontline, 1 st Edition, Cathy O'Neil and Rachel Schutt, O'Reilly, 2013

L	T	P	C
3	0	0	3

II Year I Semester

ADVANCED DATA STRUCTURES & ALGORITHM ANALYSIS

Course Objectives:

The main objectives of the course is to

- provide knowledge on advance data structures frequently used in Computer Science domain
- Develop skills in algorithm design techniques popularly used
- Understand the use of various data structures in the algorithm design

UNIT – I:

Introduction to Algorithm Analysis, Space and Time Complexity analysis, Asymptotic Notations.

AVL Trees – Creation, Insertion, Deletion operations and Applications

B-Trees – Creation, Insertion, Deletion operations and Applications

UNIT – II:

Heap Trees (Priority Queues) – Min and Max Heaps, Operations and Applications

Graphs – Terminology, Representations, Basic Search and Traversals, Connected Components and Biconnected Components, applications

Divide and Conquer: The General Method, Quick Sort, Merge Sort, Strassen's matrix multiplication, Convex Hull

UNIT – III:

Greedy Method: General Method, Job Sequencing with deadlines, Knapsack Problem, Minimum cost spanning trees, Single Source Shortest Paths

Dynamic Programming: General Method, All pairs shortest paths, Single Source Shortest Paths – General Weights (Bellman Ford Algorithm), Optimal Binary Search Trees, 0/1 Knapsack, String Editing, Travelling Salesperson problem

UNIT – IV:

Backtracking: General Method, 8-Queens Problem, Sum of Subsets problem, Graph Coloring, 0/1 Knapsack Problem

Branch and Bound: The General Method, 0/1 Knapsack Problem, Travelling Salesperson problem

UNIT – V:

NP Hard and NP Complete Problems: Basic Concepts, Cook's theorem

NP Hard Graph Problems: Clique Decision Problem (CDP), Chromatic Number Decision Problem (CNDP), Traveling Salesperson Decision Problem (TSP)

NP Hard Scheduling Problems: Scheduling Identical Processors, Job Shop Scheduling.

Textbooks:

1. Fundamentals of Data Structures in C++, Horowitz, Ellis; Sahni, Sartaj; Mehta, Dinesh 2nd Edition Universities Press
2. Computer Algorithms/C++ Ellis Horowitz, Sartaj Sahni, Sanguthevar Rajasekaran 2nd Edition University Press

Reference Books:

1. Data Structures and program design in C, Robert Kruse, Pearson Education Asia
2. An introduction to Data Structures with applications, Trembley & Sorenson, McGraw Hill
3. The Art of Computer Programming, Vol.1: Fundamental Algorithms, Donald E Knuth, Addison-Wesley, 1997.
4. Data Structures using C & C++: Langsam, Augenstein & Tanenbaum, Pearson, 1995
5. Algorithms + Data Structures & Programs:, N.Wirth, PHI
6. Fundamentals of Data Structures in C++: Horowitz Sahni & Mehta, Galgottia Pub.
7. Data structures in Java:, Thomas Standish, Pearson Education Asia

Online Learning Resources:

1. https://www.tutorialspoint.com/advanced_data_structures/index.asp
2. http://peterindia.net/Algorithms.html
3. Abdul Bari, 1. Introduction to Algorithms (youtube.com)

II Year I Semester

L	T	P	C
3	0	0	3

OBJECT-ORIENTED PROGRAMMING THROUGH JAVA

Course Objectives:

The learning objectives of this course are to:

- Identify Java language components and how they work together in applications
- Learn the fundamentals of object-oriented programming in Java, including defining classes, invoking methods, using class libraries.
- Learn how to extend Java classes with inheritance and dynamic binding and how to use exception handling in Java applications
- Understand how to design applications with threads in Java
- Understand how to use Java APIs for program development

UNIT I: Object Oriented Programming: Basic concepts, Principles, Program Structure in Java: Introduction, Writing Simple Java Programs, Elements or Tokens in Java Programs, Java Statements, Command Line Arguments, User Input to Programs, Escape Sequences Comments, Programming Style.

Data Types, Variables, and Operators :Introduction, Data Types in Java, Declaration of Variables, Data Types, Type Casting, Scope of Variable Identifier, Literal Constants, Symbolic Constants, Formatted Output with printf() Method, Static Variables and Methods, Attribute Final, **Introduction to Operators**, Precedence and Associativity of Operators, Assignment Operator (=), Basic Arithmetic Operators, Increment (++) and Decrement (- -) Operators, Ternary Operator, Relational Operators, Boolean Logical Operators, Bitwise Logical Operators.

Control Statements: Introduction, if Expression, Nested if Expressions, if–else Expressions, Ternary Operator?:, Switch Statement, Iteration Statements, while Expression, do–while Loop, for Loop, Nested for Loop, For–Each for Loop, Break Statement, Continue Statement.

UNIT II: Classes and Objects: Introduction, Class Declaration and Modifiers, Class Members, Declaration of Class Objects, Assigning One Object to Another, Access Control for Class Members, Accessing Private Members of Class, Constructor Methods for Class, Overloaded Constructor Methods, Nested Classes, Final Class and Methods, Passing Arguments by Value and by Reference, Keyword this.

Methods: Introduction, Defining Methods, Overloaded Methods, Overloaded Constructor Methods, Class Objects as Parameters in Methods, Access Control, Recursive Methods, Nesting of Methods, Overriding Methods, Attributes Final and Static.

UNIT III: Arrays: Introduction, Declaration and Initialization of Arrays, Storage of Array in Computer Memory, Accessing Elements of Arrays, Operations on Array Elements, Assigning Array to Another Array, Dynamic Change of Array Size, Sorting of Arrays, Search for Values in Arrays, Class Arrays, Two-dimensional Arrays, Arrays of Varying Lengths, Three-dimensional Arrays, Arrays as Vectors.

Inheritance: Introduction, Process of Inheritance, Types of Inheritances, Universal Super Class-Object Class, Inhibiting Inheritance of Class Using Final, Access Control and Inheritance, Multilevel Inheritance, Application of Keyword Super, Constructor Method and Inheritance, Method Overriding, Dynamic Method Dispatch, Abstract Classes, Interfaces and Inheritance.

Interfaces: Introduction, Declaration of Interface, Implementation of Interface, Multiple Interfaces, Nested Interfaces, Inheritance of Interfaces, Default Methods in Interfaces, Static Methods in Interface, Functional Interfaces, Annotations.

UNIT IV: Packages and Java Library: Introduction, Defining Package, Importing Packages and Classes into Programs, Path and Class Path, Access Control, Packages in Java SE, Java.lang Package and its Classes, Class Object, Enumeration, class Math, Wrapper Classes, Auto-boxing and Auto-unboxing, Java util Classes and Interfaces, Formatter Class, Random Class, Time Package, Class Instant (java.time.Instant), Formatting for Date/Time in Java, Temporal Adjusters Class, Temporal Adjusters Class.

Exception Handling: Introduction, Hierarchy of Standard Exception Classes, Keywords throws and throw, try, catch, and finally Blocks, Multiple Catch Clauses, Class Throwable, Unchecked Exceptions, Checked Exceptions.

Java I/O and File: Java I/O API, standard I/O streams, types, Byte streams, Character streams, Scanner class, Files in Java(Text Book 2)

UNIT V: String Handling in Java: Introduction, Interface Char Sequence, Class String, Methods for Extracting Characters from Strings, Comparison, Modifying, Searching; Class String Buffer.

Multithreaded Programming: Introduction, Need for Multiple Threads Multithreaded Programming for Multi-core Processor, Thread Class, Main Thread-Creation of New Threads, Thread States, Thread Priority-Synchronization, Deadlock and Race Situations, Inter-thread Communication - Suspending, Resuming, and Stopping of Threads.

Java Database Connectivity: Introduction, JDBC Architecture, Installing My SQL and My SQL Connector/J, JDBC Environment Setup, Establishing JDBC Database Connections, Result Set Interface

Java FX GUI: Java FX Scene Builder, Java FX App Window Structure, displaying text and image, event handling, laying out nodes in scene graph, mouse events (Text Book 3)

Text Books:

1. JAVA one step ahead, Anitha Seth, B.L.Juneja, Oxford.
2. Joy with JAVA, Fundamentals of Object Oriented Programming, DebasisSamanta, MonalisaSarma, Cambridge, 2023.
3. JAVA 9 for Programmers, Paul Deitel, Harvey Deitel, 4th Edition, Pearson.

References Books:

1. The complete Reference Java, 11thedition, Herbert Schildt,TMH
2. Introduction to Java programming, 7th Edition, Y Daniel Liang, Pearson

Online Resources:

1. https://nptel.ac.in/courses/106/105/106105191/
2. https://infyspringboard.onwingspan.com/web/en/app/toc/lex_auth_012880464547618816347_shared/overview

II Year I Semester

L	T	P	C
0	0	3	1.5

DATA SCIENCE LAB

Course Objectives:

- The main objective of the course is to inculcate the basic understanding of Data Science and its practical implementation using Python.

List of Experiments

1. Creating a NumPy Array
   a. Basic ndarray
   b. Array of zeros
   c. Array of ones
   d. Random numbers in ndarray
   e. An array of your choice
   f. Imatrix in NumPy
   g. Evenly spaced ndarray
2. The Shape and Reshaping of NumPy Array
   a. Dimensions of NumPy array
   b. Shape of NumPy array
   c. Size of NumPy array
   d. Reshaping a NumPy array
   e. Flattening a NumPy array
   f. Transpose of a NumPy array
3. Expanding and Squeezing a NumPy Array
   a. Expanding a NumPy array
   b. Squeezing a NumPy array
   c. Sorting in NumPy Arrays
4. Indexing and Slicing of NumPy Array
   a. Slicing 1-D NumPy arrays
   b. Slicing 2-D NumPy arrays
   c. Slicing 3-D NumPy arrays
   d. Negative slicing of NumPy arrays
5. Stacking and Concatenating Numpy Arrays
   a. Stacking ndarrays
   b. Concatenating ndarrays
   c. Broadcasting in Numpy Arrays
6. Perform following operations using pandas
   a. Creating dataframe
   b. concat()

c. Setting conditions
d. Adding a new column

7. Perform following operations using pandas
   a. Filling NaN with string
   b. Sorting based on column values
   c. groupby()
8. Read the following file formats using pandas
   a. Text files
   b. CSV files
   c. Excel files
   d. JSON files
9. Read the following file formats
   a. Pickle files
   b. Image files using PIL
   c. Multiple files using Glob
   d. Importing data from database
10. Demonstrate web scraping using python
11. Perform following preprocessing techniques on loan prediction dataset
    a. Feature Scaling
    b. Feature Standardization
    c. Label Encoding
    d. One Hot Encoding
12. Perform following visualizations using matplotlib
    a. Bar Graph
    b. Pie Chart
    c. Box Plot
    d. Histogram
    e. Line Chart and Subplots
    f. Scatter Plot
13. Getting started with NLTK, install NLTK using PIP
14. Python program to implement with Python Sci Kit-Learn & NLTK
15. Python program to implement with Python NLTK/Spicy/Py NLPI.

Web References:

1. https://www.analyticsvidhya.com/blog/2020/04/the-ultimate-numpy-tutorial-for-data-science-beginners/
2. https://www.analyticsvidhya.com/blog/2021/07/data-science-with-pandas-2-minutes-guide-to-key-concepts/
3. https://www.analyticsvidhya.com/blog/2020/04/how-to-read-common-file-formats-python/

4. https://www.analyticsvidhya.com/blog/2016/07/practical-guide-data-preprocessing-python-scikit-learn/
5. https://www.analyticsvidhya.com/blog/2020/02/beginner-guide-matplotlib-data-visualization-exploration-python/6.
6. https://www.nltk.org/book/ch01.html

II Year I Semester

L	T	P	C
0	0	3	1.5

OBJECT-ORIENTED PROGRAMMING THROUGH JAVA LAB

Course Objectives:

The aim of this course is to

- Practice object oriented programming in the Java programming language
- implement Classes, Objects, Methods, Inheritance, Exception, Runtime Polymorphism, User defined Exception handling mechanism
- Illustrate inheritance, Exception handling mechanism, JDBC connectivity
- Construct Threads, Event Handling, implement packages, Java FX GUI

Experiments covering the Topics:

- Object Oriented Programming fundamentals- data types, control structures
- Classes, methods, objects, Inheritance, polymorphism,
- Exception handling, Threads, Packages, Interfaces
- Files, I/O streams, JavaFX GUI

Sample Experiments:

Exercise – 1:

a) Write a JAVA program to display default value of all primitive data type of JAVA

b) Write a java program that display the roots of a quadratic equation $ax^2+bx=0$. Calculate the discriminate D and basing on value of D, describe the nature of root.

Exercise - 2

a) Write a JAVA program to search for an element in a given list of elements using binary search mechanism.

b) Write a JAVA program to sort for an element in a given list of elements using bubble sort

c) Write a JAVA program using StringBuffer to delete, remove character.

Exercise - 3

a) Write a JAVA program to implement class mechanism. Create a class, methods and invoke them inside main method.

b) Write a JAVA program implement method overloading.

c) Write a JAVA program to implement constructor.

d) Write a JAVA program to implement constructor overloading.

Exercise - 4

a) Write a JAVA program to implement Single Inheritance

b) Write a JAVA program to implement multi level Inheritance

c) Write a JAVA program for abstract class to find areas of different shapes

Exercise - 5

a) Write a JAVA program give example for "super" keyword.

b) Write a JAVA program to implement Interface. What kind of Inheritance can be achieved?

c) Write a JAVA program that implements Runtime polymorphism

Exercise - 6

a) Write a JAVA program that describes exception handling mechanism

b) Write a JAVA program Illustrating Multiple catch clauses

- Write a JAVA program for creation of Java Built-in Exceptions
- Write a JAVA program for creation of User Defined Exception

Exercise - 7

a) Write a JAVA program that creates threads by extending Thread class. First thread display "Good Morning "every 1 sec, the second thread displays "Hello "every 2 seconds and the third display "Welcome" every 3 seconds, (Repeat the same by implementing Runnable)

b) Write a program illustrating **is Alive** and **join ()**

c) Write a Program illustrating Daemon Threads.

d) Write a JAVA program Producer Consumer Problem

Exercise – 8

1. Write a JAVA program that import and use the user defined packages
2. Without writing any code, build a GUI that display text in label and image in an ImageView (use JavaFX)
3. Build a Tip Calculator app using several JavaFX components and learn how to respond to user interactions with the GUI

Exercise – 9

1. Write a java program that connects to a database using JDBC

b) Write a java program to connect to a database using JDBC and insert values into it.

c) Write a java program to connect to a database using JDBC and delete values from it

MALINENI LAKSHMAIAH
WOMEN'S ENGINEERING COLLEGE
(AUTONOMOUS)
(Accredited by "NBA" & NACC A+ Grade | Approved by AICTE, New Delhi & Affiliated to JNTUK, Kakinada)
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L	T	P	C
0	1	2	2

II Year I Semester

PYTHON PROGRAMMING

(Skill Enhancement Course)

Course Objectives:

The main objectives of the course are to

a. Introduce core programming concepts of Python programming language.
b. Demonstrate about Python data structures like Lists, Tuples, Sets and dictionaries
c. Implement Functions, Modules and Regular Expressions in Python Programming and to create practical and contemporary applications using these

UNTI-I: History of Python Programming Language, Thrust Areas of Python, Installing Anaconda Python Distribution, Installing and Using Jupyter Notebook.
Parts of Python Programming Language: Identifiers, Keywords, Statements and Expressions, Variables, Operators, Precedence and Associativity, Data Types, Indentation, Comments, Reading Input, Print Output, Type Conversions, the type () Function and Is Operator, Dynamic and Strongly Typed Language.
Control Flow Statements: if statement, if-else statement, if...elif...else, Nested if statement, while Loop, for Loop, continue and break Statements, Catching Exceptions Using try and except Statement.

Sample Experiments:

1. Write a program to find the largest element among three Numbers.
2. Write a Program to display all prime numbers within an interval
3. Write a program to swap two numbers without using a temporary variable.
4. Demonstrate the following Operators in Python with suitable examples.
   i) Arithmetic Operators ii) Relational Operators iii) Assignment Operatorsiv) Logical Operators v) Bit wise Operators vi) Ternary Operator vii) Membership Operators viii) Identity Operators
5. Write a program to add and multiply complex numbers
6. Write a program to print multiplication table of a given number.

UNIT-II: Functions: Built-In Functions, Commonly Used Modules, Function Definition and Calling the function, return Statement and void Function, Scope and Lifetime of Variables, Default Parameters, Keyword Arguments, *args and **kwargs, Command Line Arguments.
Strings: Creating and Storing Strings, Basic String Operations, Accessing Characters in String by Index Number, String Slicing and Joining, String Methods, Formatting Strings.

Lists: Creating Lists, Basic List Operations, Indexing and Slicing in Lists, Built-In Functions Used on Lists, List Methods, del Statement.

Sample Experiments:

1. Write a program to define a function with multiple return values.
2. Write a program to define a function using default arguments.
3. Write a program to find the length of the string without using any library functions.
4. Write a program to check if the substring is present in a given string or not.
5. Write a program to perform the given operations on a list:
   i. Addition ii. Insertion iii. slicing
6. Write a program to perform any 5 built-in functions by taking any list.

UNIT-III: Dictionaries: Creating Dictionary, Accessing and Modifying key:value Pairs in Dictionaries, Built-In Functions Used on Dictionaries, Dictionary Methods, del Statement.
Tuples and Sets: Creating Tuples, Basic Tuple Operations, tuple() Function, Indexing and Slicing in Tuples, Built-In Functions Used on Tuples, Relation between Tuples and Lists, Relation between Tuples and Dictionaries, Using zip() Function, Sets, Set Methods, Frozenset.

Sample Experiments:

1. Write a program to create tuples (name, age, address, college) for at least two members and concatenate the tuples and print the concatenated tuples.
2. Write a program to count the number of vowels in a string (No control flow allowed).
3. Write a program to check if a given key exists in a dictionary or not.
4. Write a program to add a new key-value pair to an existing dictionary.
5. Write a program to sum all the items in a given dictionary.

UNIT-IV:Files: Types of Files, Creating and Reading Text Data, File Methods to Read and Write Data, Reading and Writing Binary Files, Pickle Module, Reading and Writing CSV Files, Python os and os.path Modules.
Object-Oriented Programming: Classes and Objects, Creating Classes in Python, Creating Objects in Python, Constructor Method, Classes with Multiple Objects, Class Attributes Vs Data Attributes, Encapsulation, Inheritance, Polymorphism.

Sample Experiments:

1. Write a program to sort words in a file and put them in another file. The output file should have only lower-case words, so any upper-case words from source must be lowered.
2. Python program to print each line of a file in reverse order.
3. Python program to compute the number of characters, words and lines in a file.
4. Write a program to create, display, append, insert and reverse the order of the items in the array.
5. Write a program to add, transpose and multiply two matrices.
6. Write a Python program to create a class that represents a shape. Include methods to calculate its area and perimeter. Implement subclasses for different shapes like circle, triangle, and square.

UNIT-V: Introduction to Data Science: Functional Programming, JSON and XML in Python, NumPy with Python, Pandas.

Sample Experiments:

1. Python program to check whether a JSON string contains complex object or not.
2. Python Program to demonstrate NumPy arrays creation using array () function.
3. Python program to demonstrate use of ndim, shape, size, dtype.
4. Python program to demonstrate basic slicing, integer and Boolean indexing.
5. Python program to find min, max, sum, cumulative sum of array
6. Create a dictionary with at least five keys and each key represent value as a list where this list contains at least ten values and convert this dictionary as a pandas data frame and explore the data through the data frame as follows:
   a) Apply head () function to the pandas data frame
   b) Perform various data selection operations on Data Frame
7. Select any two columns from the above data frame, and observe the change in one attribute with respect to other attribute with scatter and plot operations in matplotlib

Reference Books:

1. Gowrishankar S, Veena A., Introduction to Python Programming, CRC Press.
2. Python Programming, S Sridhar, J Indumathi, V M Hariharan, 2nd Edition, Pearson, 2024
3. Introduction to Programming Using Python, Y. Daniel Liang, Pearson.

Online Learning Resources/Virtual Labs:

1. https://www.coursera.org/learn/python-for-applied-data-science-ai
2. https://www.coursera.org/learn/python?specialization=python#syllabus

Department of CSE – DATA SCIENCE

II Year I Semester

L	T	P	C
2	0	0	0

ENVIRONMENTAL SCIENCE

CourseObjectives:

- To make the students to ge tawareness on environment
- To understand the importance of protecting natural resources, ecosystems for future generations and pollution causes due to the day to day activities of human life
- To save earth from the inventions by the engineers.

CourseOutcomes:

- Grasp multidisciplinary nature of environmental studies and various renewable andnon-renewable resources.
- Understand flow and bio-geo-chemical cycles and ecological pyramids.
- Understand various causes of pollution and solid waste management and related preventive measures.
- About the rainwater harvesting, watershed management, ozone layer depletion and waste landreclamation.
- Casus of population explosion, value education and welfare programmes.

UNIT–I

Multidisciplinary Nature Of Environmental Studies: – Definition, Scope and Importance – Need forPublicAwareness.

Natural Resources:Renewable and non-renewable resources – Natural resources and associated problems – Forest resources – Use and over – exploitation, deforestation, case studies – Timberextraction – Mining, dams and other effects on forest and tribal people – Water resources – Use andover utilization of surface and ground water – Floods, drought, conflicts over water, dams – benefits and problems–Mineral resources:Use and exploitation, environmental effects of extracting and using mineral resources, case studies– Food resources:World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity,casestudies.–Energy resources:

UNIT–II

Ecosystems: Concep to fan ecosystem.–Structure and function of an ecosystem–Producers, consumers and decomposers – Energy flow in the ecosystem – Ecological succession – Food

chains, food webs and ecological pyramids–Introduction, types, characteristic features, structure and function of the following ecosystem:

a. Forest ecosystem.
b. Grassl and ecosystem
c. Desert ecosystem
d. Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)

Biodiversity And Its Conservation: Introduction Definition: genetic, species and ecosystem diversity–Bio-geographical classification of India–Value of biodiversity: consumptive use,

Productive use, social, ethical, aesthetic and option values – Biodiversity at global, National and locallevels – India as a mega-diversity nation – Hot-sports of biodiversity – Threats to biodiversity: habitat loss,poaching of wildlife, man-wildlife conflicts– Endangered and endemic species of India –Conservation of biodiversity:In-situand Ex-situ conservation of biodiversity.

UNIT–III

Environmental Pollution:Definition, Cause, effects and control measures of:

a. Air Pollution.
b. Water pollution
c. Soil pollution
d. Marine pollution
e. Noise pollution
f. Thermal pollution
g. Nuclear hazards

Solid Waste Management: Causes, effects and control measures of urban and industrial wastes – Roleof an individual in prevention of pollution – Pollution case studies – Disaster management: floods,earthquake,cycloneandlandslides.

UNIT–IV

Social Issues and the Environment: From Unsustainable to Sustainable development– Urban problems related to energy – Water conservation, rain water harvesting, watershed management – Resettlement and rehabilitation of people; its problems and concerns. Case studies – Environmental ethics: Issues and possible solutions–Climate change, global warming, acidrain, ozone layer depletion, nuclear accidents and holocaust. Case Studies – Wastel and reclamation. – Consumerism and waste products. – Environment ProtectionAct. – Air (Prevention and Control of Pollution) Act. –Water (Prevention and control of Pollution) Act–Wild life Protection Act– Forest Conservation Act–Issues involved inenforcement of environment allegislation–Public

awareness.

UNIT–V

Human Population And The Environment: Population growth, variation among nations. Population explosion – Family Welfare Programmes. – Environment and human health – Human Rights – Value Education–HIV/AIDS–Women and Child Welfare–Role of information Technology in Environment and human health–Case studies. Field Work:Visitto a local area to document environmental assets River/ forest grassland/ hill/ mountain – Visit to a local polluted site-Urban/Rural/Industrial/Agricultural Study of common plants,insects, and birds–river, hills lopes,etc..

Text books:

1. Text book of Environmental Studies for Undergraduate Courses ErachBharucha for University Grants Commission,Universities Press.
2. Palaniswamy,"Environmental Studies",Pearson education
3. S.AzeemUnnisa,"Environmental Studies"Academic Publishing Company
4. K.RaghavanNambiar,"Text book of Environmental Studies for UndergraduateCourses as per UGC model syllabus", Scitech Publications (India), Pvt.Ltd.

Reference Books:

1. DeekshaDaveandE.SaiBabaReddy, "Text book of Environmental Science",Cengage Publications.
2. M.AnjiReddy,"Text book of Environmental Sciences and Technology",BSPublication.
3. J.P.Sharma,Comprehensive Environmental studies,Laxmi publications.
4. J.GlynnHenryandGaryW.Heinke,"Environmental Sciences and Engineering",Prentice Hall of India Private limited
5. G.R.Chatwal,"A Text Book of Environmental Studies"Himalaya Publishing House
6. Gilbert M.Masters and WendellP.Ela,"Introduction to Environmental Engineeringand Science,Prentice Hall of India Private limited.

II Year II Semester

L	T	P	C
3	0	0	3

DATA ENGINEERING

Course Objectives:

- Explain basic concepts of Data Engineering
- Discuss bout Data Engineering Life Cycle
- How to design Good Data Architecture

UNIT-I: Introduction to Data Engineering: Definition, Data Engineering Life Cycle, Evolution of Data Engineer, Data Engineering Versus Data Science, Data Engineering Skills and Activities,

Data Maturity, Data Maturity Model, Skills of a Data Engineer, Business Responsibilities, Technical Responsibilities, Data Engineers and Other Technical Roles.

UNIT-II: Data Engineering Life Cycle: Data Life Cycle Versus Data Engineering Life Cycle, Generation: Source System, Storage, Ingestion, Transformation, Serving Data.

Major undercurrents across the Data Engineering Life Cycle: Security, Data Management, DataOps, Data Architecture, Orchestration, Software Engineering.

UNIT-III: Designing Good Data Architecture: Enterprise Architecture, Data Architecture, Principles of Good Data Architecture, Major Architecture Concepts.

Data Generation in Source Systems: Sources of Data, Files and Unstructured Data, APIs, Application Databases (OLTP), OLAP, Change Data Capture, Logs, Database Logs, CRUD, Source System Practical Details.

UNIT-IV: Storage: Raw Ingredients of Data Storage, Data Storage Systems, Data Engineering Storage Abstractions, Data warehouse, Data Lake, Data Lakehouse.

Ingestion: Data Ingestion, Key Engineering considerations for the Ingestion Phase, Batch Ingestion Considerations, Message and Stream Ingestion Considerations, Ways to Ingest Data

UNIT-V: Queries, Modeling and Transformation: Queries, Life of a Query, Query Optimizer, Queries on Streaming Data, Data Modelling, Modeling Streaming Data, Transformations, Streaming Transformations and Processing.

Serving Data for Analytics, Machine Learning and Reverse ETL: General Considerations for serving Data, Business Analytics, Operational Analytics, Embedded Analytics, Ways to serve data for analytics and ML, Reverse ETL.

Text Books:

1. Joe Reis, Matt Housley, Fundamentals of Data Engineering, O'Reilly Media, Inc.,June 2022,ISBN: 9781098108304

Reference Books:

1. Paul Crickard , Data Engineering with Python,Packt Publishing, October 2020.
2. Ralph Kimball, Margy Ross, The Data Warehouse Toolkit: The Definitive Guide to Dimensional Modeling, Wiley, 3rd Edition, 2013
3. James Densmore, Data Pipelines Pocket Reference: Moving and Processing Data for Analytics, O'Reilly Media, 1st Edition, 2021

II Year II Semester

L	T	P	C
3	0	0	3

DATABASE MANAGEMENT SYSTEMS

Course Objectives:

The main objectives of the course is to

- Introduce database management systems and to give a good formal foundation on the relational model of data and usage of Relational Algebra
- Introduce the concepts of basic SQL as a universal Database language
- Demonstrate the principles behind systematic database design approaches by covering conceptual design, logical design through normalization
- Provide an overview of physical design of a database system, by discussing Database indexing techniques and storage techniques

UNIT I: Introduction: Database system, Characteristics (Database Vs File System), Database Users, Advantages of Database systems, Database applications. Brief introduction of different Data Models; Concepts of Schema, Instance and data independence; Three tier schema architecture for data independence; Database system structure, environment, Centralized and Client Server architecture for the database.

Entity Relationship Model: Introduction, Representation of entities, attributes, entity set, relationship, relationship set, constraints, sub classes, super class, inheritance, specialization, generalization using ER Diagrams.

Unit II: Relational Model: Introduction to relational model, concepts of domain, attribute, tuple, relation, importance of null values, constraints (Domain, Key constraints, integrity constraints) and their importance, Relational Algebra, Relational Calculus. BASIC SQL:Simple Database schema, data types, table definitions (create, alter), different DML operations (insert, delete, update).

UNIT III: SQL: Basic SQL querying (select and project) using where clause, arithmetic & logical operations, SQL functions(Date and Time, Numeric, String conversion).Creating tables with relationship, implementation of key and integrity constraints, nested queries, sub queries, grouping, aggregation, ordering, implementation of different types of joins, view(updatable and non-updatable), relational set operations.

UNIT IV: Schema Refinement (Normalization): Purpose of Normalization or schema refinement, concept of functional dependency, normal forms based on functional dependencyLossless join and dependency preserving decomposition, (1NF, 2NF and 3 NF), concept of surrogate key, Boyce-Codd normal form(BCNF), MVD, Fourth normal form(4NF), Fifth Normal Form (5NF).

UNIT V: Transaction Concept: Transaction State, ACID properties, Concurrent Executions, Serializability, Recoverability, Implementation of Isolation, Testing for Serializability, lock based, time stamp based, optimistic, concurrency protocols, Deadlocks, Failure Classification, Storage, Recovery and Atomicity, Recovery algorithm.
Introduction to Indexing Techniques: B+ Trees, operations on B+Trees, Hash Based Indexing:

Text Books:

1) Database Management Systems, 3rd edition, Raghurama Krishnan, Johannes Gehrke, TMH (For Chapters 2, 3, 4)
2) Database System Concepts,5th edition, Silberschatz, Korth, Sudarsan,TMH (For Chapter 1 and Chapter 5)

Reference Books:

1. Introduction to Database Systems, 8thedition, C J Date, Pearson.
2. Database Management System, 6th edition, RamezElmasri, Shamkant B. Navathe, Pearson
3. Database Principles Fundamentals of Design Implementation and Management, Corlos Coronel, Steven Morris, Peter Robb, Cengage Learning.

Web-Resources:

1. https://nptel.ac.in/courses/106/105/106105175/
2. https://infyspringboard.onwingspan.com/web/en/app/toc/lex_auth_012758066672820224 56_shared/overview

II Year II Semester

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COMPUTER ORGANIZATION AND ARCHITECTURE

Course Objectives:

The purpose of the course is

- Discuss about principles of computer organization and the basic architectural concepts.
- Explain in depth understanding of basic organization, design, programming of a simple digital computer, computer arithmetic, instruction set design, micro programmed control unit, pipelining and vector processing, memory organization and I/O systems.

UNIT I: Digital Computers and Data Representation: Introduction, Numbering Systems, Decimal to Binary Conversion, Binary Coded Decimal Numbers, Weighted Codes, Self-Complementing Codes, Cyclic Codes, Error Detecting Codes, Error Correcting Codes, Hamming Code for Error Correction, Alphanumeric Codes, ASCI Code

Data Representation: Data types, Complements, Fixed Point Representation, Floating Point Representation.

Boolean Algebra and Logical gates: Boolean Algebra :Theorems and properties, Boolean functions, canonical and standard forms , minimization of Boolean functions using algebraic identities; Karnaugh map representation and minimization using two and three variable Maps ;Logical gates ,universal gates and Two- level realizations using gates : AND-OR, OR-AND, NAND-NAND and NOR-NOR structures

UNIT II: Digital logic circuits: Combinatorial Circuits: Introduction, Combinatorial Circuit Design Procedure, Implementation using universal gates, Multi-bit adder, Multiplexers, De-multiplexers, Decoders

Sequential Switching Circuits: Latches and Flip-Flops, Ripple counters using T flip-flops; **Synchronous counters**: Shift Registers; Ring counters

UNIT III: Computer Arithmetic: Addition and subtraction, multiplication Algorithms, Booth multiplication algorithm, Division Algorithms, Floating – point Arithmetic Operations.

Register Transfer language and micro instructions: Bus memory transfer, arithmetic and logical micro-operations, shift and rotate micro-operations

Basic Computer Organization and Design: Stored program concept, computer Registers, common bus system, Computer instructions, Timing and Control, Instruction cycle, Memory Reference Instructions, Input–Output configuration and program Interrupt.

UNIT IV: Micro programmed Control: Control memory, Address sequencing, microprogram example, design of control unit.
Central Processing Unit: General Register Organization, Instruction Formats, Addressing modes, Data Transfer and Manipulation
Program Control: conditional Flags and Branching

UNITV: Memory Organization: Memory Hierarchy, Main Memory, Auxiliary memory, Associate Memory, Cache Memory.
Input-Output Organization: Input-Output Interface, Asynchronous data transfer, Modes of Transfer, Priority Interrupt Direct memory Access.

Text Books:

1. Digital Logic and Computer Design, Moriss Mano, 11th Edition, Pearson.
2. Computer System Architecture,3rd Edition, M.Morris Mano, PHI

Reference Books:

1. Digital Logic and Computer Organization, Rajaraman, Radha krishnan, PHI, 2006
2. Computer Organization, 5Th Edition, Hamacher, Vranesic, Zaky, TMH, 2002
3. Computer Organization & Architecture: Designing for Performance, 7th Edition, William Stallings, PHI, 2006

II Year II Semester

L	T	P	C
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DATA ENGINEERING LAB

Course Objective:

- The main objective of this course is to teach how build data engineering infrastructure and data pipelines.

Course Outcomes:

At the end of the course student will be able to:

1. Build our Data Engineering Infrastructure
2. Demonstrate Reading and Writing files
3. Build Data Pipelines and integrate with Dashboard
4. Deploy the Data Pipeline in production

Experiments:

1. Installing and configuring Apache NiFi, Apache Airflow
2. Installing and configuring Elasticsearch, Kibana, PostgreSQL, pgAdmin 4
3. Reading and Writing files
    a. Reading and writing files in Python
    b. Processing files in Airflow
    c. NiFi processors for handling files
    d. Reading and writing data to databases in Python
    e. Databases in Airflow
    f. Database processors in NiFi
4. Working with Databases
    a. Inserting and extracting relational data in Python
    b. Inserting and extracting NoSQL database data in Python
    c. Building database pipelines in Airflow
    d. Building database pipelines in NiFi
5. Cleaning, Transforming and Enriching Data
    a. Performing exploratory data analysis in Python
    b. Handling common data issues using pandas
    c. Cleaning data using Airflow
6. Building the Data Pipeline
7. Building a Kibana Dash Board

8. Perform the following operations
    a. Staging and validating data
    b. Building idempotent data pipelines
    c. Building atomic data pipelines
9. Version Control with the NiFi Registry
    a. Installing and configuring the NiFi Registry
    b. Using the Registry in NiFi
    c. Versioning your data pipelines
    d. Using git-persistence with the NiFi Registry
10. Monitoring Data Pipelines
    a. Monitoring NiFi in the GUI
    b. Monitoring NiFi using processors
    c. Monitoring NiFi with Python and the REST API
11. Deploying Data Pipelines
    a. Finalizing your data pipelines for production
    b. Using the NiFi variable registry
    c. Deploying your data pipelines
12. Building a Production Data Pipeline
    a. Creating a test and production environment
    b. Building a production data pipeline
    c. Deploying a data pipeline in production

Reference Books:

1. Paul Crickard , Data Engineering with Python,Packt Publishing, October 2020.

II Year II Semester

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0	0	3	1.5

DATABASE MANAGEMENT SYSTEMS LAB

Course Objectives:

This Course will enable students to

- Populate and query a database using SQL DDL/DML Commands
- Declare and enforce integrity constraints on a database
- Writing Queries using advanced concepts of SQL
- Programming PL/SQL including procedures, functions, cursors and triggers,

Experiments covering the topics:

- DDL, DML, DCL commands
- Queries, nested queries, built-in functions,
- PL/SQL programming- control structures
- Procedures, Functions, Cursors, Triggers,
- Database connectivity- ODBC/JDBC

Sample Experiments:

1. Creation, altering and droping of tables and inserting rows into a table (use constraints while creating tables) examples using SELECT command.
2. Queries (along with sub Queries) using ANY, ALL, IN, EXISTS, NOTEXISTS, UNION, INTERSET, Constraints. Example:- Select the roll number and name of the student who secured fourth rank in the class.
3. Queries using Aggregate functions (COUNT, SUM, AVG, MAX and MIN), GROUP BY, HAVING and Creation and dropping of Views.
4. Queries using Conversion functions (to_char, to_number and to_date), string functions (Concatenation, lpad, rpad, ltrim, rtrim, lower, upper, initcap, length, substr and instr), date functions (Sysdate, next_day, add_months, last_day, months_between, least, greatest, trunc, round, to_char, to_date)
5.
   i. Create a simple PL/SQL program which includes declaration section, executable section and exception –Handling section (Ex. Student marks can be selected from the table and printed for those who secured first class and an exception can be raised if no records were found)
   ii. Insert data into student table and use COMMIT, ROLLBACK and SAVEPOINT in PL/SQL block.

6. Develop a program that includes the features NESTED IF, CASE and CASE expression. The program can be extended using the NULLIF and COALESCE functions.
7. Program development using WHILE LOOPS, numeric FOR LOOPS, nested loops using ERROR Handling, BUILT –IN Exceptions, USE defined Exceptions, RAISE-APPLICATION ERROR.
8. Programs development using creation of procedures, passing parameters IN and OUT of PROCEDURES.
9. Program development using creation of stored functions, invoke functions in SQL Statements and write complex functions.
10. Develop programs using features parameters in a CURSOR, FOR UPDATE CURSOR, WHERE CURRENT of clause and CURSOR variables.
11. Develop Programs using BEFORE and AFTER Triggers, Row and Statement Triggers and INSTEAD OF Triggers
12. Create a table and perform the search operation on table using indexing and non-indexing techniques.
13. Write a Java program that connects to a database using JDBC
14. Write a Java program to connect to a database using JDBC and insert values into it
15. Write a Java program to connect to a database using JDBC and delete values from it

Text Books/Suggested Reading:

1. Oracle: The Complete Reference by Oracle Press
2. Nilesh Shah, "Database Systems Using Oracle", PHI, 2007
3. Rick F Vander Lans, "Introduction to SQL", Fourth Edition, Pearson Education, 2007

II Year II Semester

L	T	P	C
0	1	2	2

EXPLORATORY DATA ANALYSIS USING PYTHON
(SKILL DEVELOPMENT COURSE)

Course Objectives:

1. This course introduces the fundamentals of Exploratory Data Analysis
2. It covers essential exploratory techniques for understanding multivariate data by summarizing it through statistical methods and graphical methods.

Course Outcomes:

1. Enumerate the fundamentals of Exploratory Data Analysis.
2. Visualize the data using basic graphs and plots.
3. Apply different Data Transformation Techniques.
4. Summarize the data using descriptive statistics.
5. Evaluate the Models and select the best model

UNIT-I

Exploratory Data Analysis Fundamentals: Understanding data science, The significance of EDA, Steps in EDA, Making sense of data, Numerical data, Categorical data, Measurement scales, Comparing EDA with classical and Bayesian analysis, Software tools available for EDA, Getting started with EDA.

Sample Experiments:

1. a) Download Dataset from Kaggle using the following link : https://www.kaggle.com/datasets/sukhmanibedi/cars4u
   b) Install python libraries required for Exploratory Data Analysis (numpy, pandas, matplotlib,seaborn)
2. Perform Numpy Array basic operations and Explore Numpy Built-in functions.
3. Loading Dataset into pandas dataframe
4. Selecting rows and columns in the dataframe

UNIT-II

Visual Aids for EDA: Technical requirements, Line chart, Bar charts, Scatter plot using seaborn, Polar chart, Histogram, Choosing the best chart

Case Study:EDA with Personal Email, Technical requirements, Loading the dataset, Data transformation, Data cleansing, Applying descriptive statistics, Data refactoring, Data analysis.

Sample Experiments:

1. Apply different visualization techniques using sample dataset
   a) Line Chart b) Bar Chart c) Scatter Plots d)Bubble Plot

2. Generate Scatter Plot using seaborn library for iris dataset
3. Apply following visualization Techniques for a sample dataset
a) Area Plot b) Stacked Plot c) Pie chart d) Table Chart
4. Generate the following charts for a dataset.
a) Polar Chart b)Histogram c)Lollipop chart
5. Case Study: Perform Exploratory Data Analysis with Personal Email Data

UNIT-III

Data Transformation: Merging database-style dataframes, Concatenating along with an axis, Merging on index, Reshaping and pivoting, Transformation techniques, Handling missing data, Mathematical operations with NaN, Filling missing values, Discretization and binning, Outlier detection and filtering, Permutation and random sampling, Benefits of data transformation, Challenges.

Sample Experiments:

1. Perform the following operations
   a) Merging Dataframes
   b) Reshaping with Hierarchical Indexing
   c) Data Deduplication
   d) Replacing Values
2. Apply different Missing Data handling techniques
   a) NaN values in mathematical Operations
   b) Filling in missing data
   c) Forward and Backward filling of missing values
   d) Filling with index values
   e) Interpolation of missing values
3. Apply different data transformation techniques
   a) Renaming axis indexes
   b)Discretization and Binning
   c) Permutation and Random Sampling
   d) Dummy variables

UNIT-IV

Descriptive Statistics: Distribution function, Measures of central tendency, Measures of dispersion, Types of kurtosis, Calculating percentiles, Quartiles, Grouping Datasets, Correlation, Understanding univariate, bivariate, multivariate analysis, Time Series Analysis

Sample Experiments:

1. Study the following Distribution Techniques on a sample data
   a) Uniform Distribution
   b) Normal Distribution
   c) Gamma Distribution
   d) Exponential Distribution
   e) Poisson Distribution

f) Binomial Distribution

2. Perform Data Cleaning on a sample dataset.
3. Compute measure of Central Tendency on a sample dataset
   a) Mean b)Median c)Mode
4. Explore Measures of Dispersion on a sample dataset
   a) Variance b) Standard Deviation c) Skewness d) Kurtosis
5. a) Calculating percentiles on sample dataset
   b) Calculate Inter Quartile Range(IQR) and Visualize using Box Plots
6. Perform the following analysis on automobile dataset.
   a) Bivariate analysis b)Multivariate analysis
7. Perform Time Series Analysis on Open Power systems dataset

UNIT-V

Model Development and Evaluation: Unified machine learning workflow, Data preprocessing, Data preparation, Training sets and corpus creation, Model creation and training, Model evaluation, Best model selection and evaluation, Model deployment

Case Study:EDA on Wine Quality Data Analysis

Sample Experiments:

1. Perform hypothesis testing using statsmodels library
   a) Z-Test b)T-Test
2. Develop model and Perform Model Evaluation using different metrics such as prediction score, R2 Score, MAE Score, MSE Score.

22. Case Study: Perform Exploratory Data Analysis with Wine Quality Dataset

Text Book:

1. Suresh Kumar Mukhiya, Usman Ahmed, Hands-On Exploratory Data Analysis with Python, Packt Publishing, 2020.

References:

1. Ronald K. Pearson, Exploratory Data Analysis Using R, CRC Press, 2020
2. Radhika Datar,Harish Garg, Hands-On Exploratory Data Analysis with R: Become an expert in exploratory data analysis using R packages, Ist Edition, Packt Publishing, 2019

Web References:

1. https://github.com/PacktPublishing/Hands-on-Exploratory-Data-Analysis-with-Python
2. https://www.analyticsvidhya.com/blog/2022/07/step-by-step-exploratory-data-analysis-eda-using-python/#h-conclusion
3. https://github.com/PacktPublishing/Exploratory-Data-Analysis-with-Python-Cookbook

II Year II Semester

L	T	P	C
1	0	2	2

DESIGN THINKING & INNOVATION

Course Objectives: The objectives of the course are to

- Bring awareness on innovative design and new product development.
- Explain the basics of design thinking.
- Familiarize the role of reverse engineering in product development.
- Train how to identify the needs of society and convert into demand.
- Introduce product planning and product development process.

UNIT – I Introduction to Design Thinking

Introduction to elements and principles of Design, basics of design-dot, line, shape, form as fundamental design components. Principles of design. Introduction to design thinking, history of Design Thinking, New materials in Industry.

UNIT - II Design Thinking Process

Design thinking process (empathize, analyze, idea & prototype), implementing the process in driving inventions, design thinking in social innovations. Tools of design thinking - person, costumer, journey map, brainstorming, product development

Activity: Every student presents their idea in three minutes, Every student can present design process in the form of flow diagram or flow chart etc. Every student should explain about product development.

UNIT - III Innovation

Art of innovation, Difference between innovation and creativity, role of creativity and innovation in organizations. Creativity to Innovation. Teams for innovation, Measuring the impact and value of creativity.

Activity: Debate on innovation and creativity, Flow and planning from idea to innovation, Debate on value-based innovation.

UNIT - IV Product Design

Problem formation, introduction to product design, Product strategies, Product value, Product planning, product specifications. Innovation towards product design Case studies.

Activity: Importance of modeling, how to set specifications, Explaining their own product design.

UNIT – V Design Thinking in Business Processes:

Design Thinking applied in Business & Strategic Innovation, Design Thinking principles that redefine business – Business challenges: Growth, Predictability, Change, Maintaining Relevance, Extreme competition, Standardization. Design thinking to meet corporate needs. Design thinking for Startups. Defining and testing Business Models and Business Cases. Developing & testing prototypes.

Activity: How to market our own product, about maintenance, Reliability and plan for startup.

Textbooks:

1. Tim Brown, Change by design, 1/e, Harper Bollins, 2009.
2. Idris Mootee, Design Thinking for Strategic Innovation, 1/e, Adams Media, 2014.

Reference Books:

1. David Lee, Design Thinking in the Classroom, Ulysses press, 2018.
2. Shrrutin N Shetty, Design the Future, 1/e, Norton Press, 2018.
3. William lidwell, Kritinaholden, &Jill butter, Universal principles of design, 2/e, Rockport Publishers, 2010.
4. Chesbrough.H, The era of open innovation, 2003.

Online Learning Resources:

- https://nptel.ac.in/courses/110/106/110106124/
- https://nptel.ac.in/courses/109/104/109104109/
- https://swayam.gov.in/nd1_noc19_mg60/preview
- https://onlinecourses.nptel.ac.in/noc22_de16/preview

Course Outcomes:

COs	Statements	Blooms Level
CO1	Define the concepts related to design thinking.	L1
CO2	Explain the fundamentals of Design Thinking and innovation.	L2
CO3	Apply the design thinking techniques for solving problems in various sectors.	L3
CO4	Analyze to work in a multidisciplinary environment.	L4
CO5	Evaluate the value of creativity.	L5

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Pulladigunta (Vil), Vatticherukuru (Md), Prathipadu Road, Guntur – 522 017 A.P.
Department of Artificial Intelligence and Data Science

Date: 03-July-2024

The minutes of meeting of Second BOS meeting for the department of **Artificial Intelligence and Data Science** was held on **03-July-2024** in AI & DS HOD Chamber.

Members Present:

S. No.	Members	Name & Institution	Status of Attendance	Signature
1	Chairperson	Dr. N. Ch. Jaya Rao, Associate Professor & HOD Ph: 8008207088 E-Mail: aidshod@malinenicolleges.ac.in	Present	
2	University Nominee	Dr. O. Srinivasa Rao, Professor of CSE, UCEK, JNTUK Ph: 94419 51718 E-Mail: osr.phd@jntucek.ac.in	Present	
3	Subject experts from outside the college	1. Dr. M. N. V. Kiran Babu, Associate Professor, Dept. of CSA, KL University. Ph: 98853 43478 E-Mail: mnvkiranbabu@kluniversity.in	Present	
		2. Dr. K. Nageswara Rao, Professor Dept. of CSE, Narasaraopet Engineering College, Narasaraopet. Ph: 98661 86158 E-Mail: nageswararaokapu@yahoo.com	Present	
4	Representative from Industry	Ms. Posam Sai Meghana, Senior Software Engineer, Wipro, Chennai. Ph: 91779 39767 posammeghana02@gmail.com	Present	
5	Member	Ms. G. Sri Lakshmi Assistant Professor Ph: 9030621654 E-Mail: srilakshmi.gunda1@gmail.com	Present	
6	Member	Ms. R. Akhila Assistant Professor Ph: 8639972296 E-Mail: akhila.raavi87@gmail.com	Present	
7	Member	Ms. K. Sirisha Assistant Professor Ph: 9440782479 E-Mail: lankothusirisha@gmail.com	Present	

Meeting Agenda:

Item No: 1
Discussion on Proposed Course Structure of II B. Tech I Semester & Ratification of the same

Item No: 2
Discussion on Proposed Course Structure of II B. Tech II Semester & Ratification of the same

Item No: 3
Discussion on Proposed Syllabus of Courses Offered by Department in II B. Tech

Item No: 4
Any Other Points raised by BOS Members

Item No:1
Discussion on Proposed Course Structure of II B. Tech, I-Sem and Ratification of the same.

II-B. Tech - I Semester Artificial Intelligence and Data Science

S. No	Category	Title	L	T	P	Credits
1	BS&H	Discrete Mathematics & Graph Theory	3	0	0	3
2	BS&H	Universal human values – understanding harmony and Ethical human conduct	2	1	0	3
3	**Engineering Science**	**Database Management Systems**	**3**	**0**	**0**	**3**
4	**Professional Core**	**Advanced Data Structures Algorithms Analysis**	**3**	**0**	**0**	**3**
5	**Professional Core**	**Object Oriented Programming Through Java**	**3**	**0**	**0**	**3**
6	**Professional Core**	**Advanced Data Structures and Algorithms Analysis Lab**	**0**	**0**	**3**	**1.5**
7	**Professional Core**	**Object Oriented Programming Through Java Lab**	**0**	**0**	**3**	**1.5**
8	**Skill Enhancement course**	**Python Programming Lab**	**0**	**1**	**2**	**2**
9	**Audit Course**	**Environmental Science**	**2**	**0**	**0**	-
Total			**16**	**2**	**8**	**20**

The Course Structure of II B. Tech I-Sem is put before the BOS Members and asked for any changes in the courses offered by Department of Artificial Intelligence and Data Science. All the BOS members accepted this course structure and ratified the same.

Item No: 2
Discussion on Proposed Course Structure of II B. Tech, II-Sem and Ratification of the same.

II B. Tech, II Semester, Artificial Intelligence and Data Science

S. No	Category	Title	L	T	P	Credits
1	Management Course-I	Managerial Economic and Financial Analysis	2	0	0	2
2	Engineering Science/ Basic Science	Statistical methods for Data Science	3	0	0	3
3	**Professional Core**	**Artificial Intelligence**	**3**	**0**	**0**	**3**
4	**Professional Core**	**Introduction to Data Science**	**3**	**0**	**0**	**3**
5	**Professional Core**	**Digital Logic & Computer Organization**	**3**	**0**	**0**	**3**
6	**Professional Core**	**Artificial Intelligence Lab**	**0**	**0**	**3**	**1.5**
7	**Professional Core**	**Data Science using Python Lab**	**0**	**0**	**3**	**1.5**
8	**Skill Enhancement course**	**Full Stack Development-1**	**0**	**1**	**2**	**2**
9	**BS&H**	**Design Thinking & Innovation**	**1**	**0**	**2**	**2**
Total			**15**	**1**	**10**	**21**
Mandatory Community Service Project Internship of 08 weeks duration during summervacation						

The Course Structure of II B. Tech II-Sem is put before the BOS Members and asked for any changes in the courses offered by Department of Artificial Intelligence and Data Science. All the BOS members accepted this course structure and ratified the same.

Item No: 3

Discussion on Proposed Syllabus of Courses Offered by Department in II B. Tech, I Sem and Ratification of the same.

Proposed Syllabus of the Courses Offered by the Department of Artificial Intelligence and Data Science is put before the BOS Members and asked for the modifications if any. As per the suggestions given by BOS members syllabus is modified without deviating the norms and ratified the same.

Discussion on Proposed Syllabus of Courses Offered by Department in II B. Tech, II Sem and Ratification of the same.

Proposed Syllabus of the Courses Offered by the Department of Artificial Intelligence and Data Science is put before the BOS Members and asked for the modifications if any. As per the suggestions given by BOS members syllabus is modified without deviating the norms and ratified the same.

Item No: 4

1. The chairperson **Dr. N. Ch. Jaya Rao** mentioned that from university instruction, do not change professional core courses. If at all needed (or) strongly recommended by BoS members then we need to take approval from university authorities.

2. **Dr. K. Nageswara Rao** raised about change of content of a course, **chairperson** replied that course content can be changed up to 25% if needed.

3. University nominee **Dr. O. Srinivasa Rao** raised that "In Advanced Data Structures and Algorithm Analysis course, in Unit-V, seems to be little hard for second year 1st semester students, think of it". **Chairperson** replied that "Based on the difficulty and level of the student, we will modify if needed".

4. University nominee **Dr. O. Srinivasa Rao** raised that "In the course JAVA in V-unit Java Database Connectivity is there, so do they have enough knowledge about DBMS?". **Chairperson** justified as DBMS and JAVA both courses are running parallelly in the same semester. **Dr. O. Srinivasa Rao** convinced with that.

5. While discussing Lab courses, **Dr. MNV Kiran Babu** raised a point that "Is there any provision to do some exercise online, so that students can get badges, and certificates so that it can be helpful in their placements". **Chairperson** replied that Salesforce administrator and developer on virtual platform and many online internships are there that helps students to enhance their skills.

6. **Dr. MNV Kiran Babu** raised a point while discussing about II-year II semester courses syllabus that "As second year students, can they able to follow Full Stack Development directly because used to introduce Mean Stack Development and then Full Stack Development." **Chairperson** went back to see the title and syllabus of the course, there mentioned course name as "Full Stack

Development-1 and in the syllabus, HTML, CSS, JavaScript and node.js. **Dr. MNV Kiran babu** also realized with the syllabus and expected Full Stack Development-II in the third year. **Dr. K. Nageswara Rao** also agreed with this.

7. **Ms. P. Sai Meghana** from Industry asked that does the students doing internships with their own ideas? **Chairperson** replied that "It is completely predefined content-based / videos-based learning. Students have to go through and complete the given assignments to get the certificate.

8. **Chairperson** mentioned that "we follow the JNTUK syllabus for Environmental Science (Audit Course) course". No objection from BoS members.

Finally, Chairman of BOS thanked all the members of their valuable inputs and active participation in the meeting.

Chairperson

BOS – AI & DS, MLWEC.

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Department of Artificial Intelligence and Data Science

II Year II Semester

L	T	P	C
0	0	3	1.5

DATA SCIENCE USING PYTHON LAB

Course Objectives:

- The main objective of the course is to inculcate the basic understanding of Data Science and its practical implementation using Python.

List of Experiments:

1. Creating a NumPy Array
    a. Basic ndarray
    b. Array of zeros
    c. Array of ones
    d. Random numbers in ndarray
    e. An array of your choice
    f. Imatrix in NumPy
    g. Evenly spaced ndarray
2. The Shape and Reshaping of NumPy Array
    a. Dimensions of NumPy array
    b. Shape of NumPy array
    c. Size of NumPy array
    d. Reshaping a NumPy array
    e. Flattening a NumPy array
    f. Transpose of a NumPy array
3. Expanding and Squeezing a NumPy Array
    a. Expanding a NumPy array
    b. Squeezing a NumPy array
    c. Sorting in NumPy Arrays
4. Indexing and Slicing of NumPy Array
    a. Slicing 1-D NumPy arrays
    b. Slicing 2-D NumPy arrays
    c. Slicing 3-D NumPy arrays
    d. Negative slicing of NumPy arrays
5. Stacking and Concatenating Numpy Arrays

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a. Stacking ndarrays
b. Concatenating ndarrays
c. Broadcasting in Numpy Arrays

6. Perform following operations using pandas
   a. Creating dataframe
   b. concat()
   c. Setting conditions
   d. Adding a new column
7. Perform following operations using pandas
   a. Filling NaN with string
   b. Sorting based on column values
   c. groupby()
8. Read the following file formats using pandas
   a. Text files
   b. CSV files
   c. Excel files
   d. JSON files
9. Read the following file formats
   a. Pickle files
   b. Image files using PIL
   c. Multiple files using Glob
   d. Importing data from database
10. Demonstrate web scraping using python
11. Perform following preprocessing techniques on loan prediction dataset
    a. Feature Scaling
    b. Feature Standardization
    c. Label Encoding
    d. One Hot Encoding
12. Perform following visualizations using matplotlib
    a. Bar Graph
    b. Pie Chart
    c. Box Plot

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d. Histogram

e. Line Chart and Subplots

f. Scatter Plot

13. Getting started with NLTK, install NLTK using PIP
14. Python program to implement with Python Sci Kit-Learn & NLTK
15. Python program to implement with Python NLTK/Spicy/Py NLPI.

Web References:

1. https://www.analyticsvidhya.com/blog/2020/04/the-ultimate-numpy-tutorial-for-data- science-beginners/
2. https://www.analyticsvidhya.com/blog/2021/07/data-science-with-pandas-2-minutes- guide-to-key-concepts/
3. https://www.analyticsvidhya.com/blog/2020/04/how-to-read-common-file-formats- python/
4. https://www.analyticsvidhya.com/blog/2016/07/practical-guide-data-preprocessing- python-scikit-learn/
5. https://www.analyticsvidhya.com/blog/2020/02/beginner-guide-matplotlib-data- visualization-exploration-python/6.
6. https://www.nltk.org/book/ch01.html

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II Year II Semester

FULL STACK DEVELOPMENT – 1

(Skill Enhancement Course)

Course Objectives:

The main objectives of the course are to

1. Make use of HTML elements and their attributes for designing static web pages
2. Build a web page by applying appropriate CSS styles to HTML elements
3. Experiment with JavaScript to develop dynamic web pages and validate forms

Experiments covering the Topics:

- Lists, Links and Images
- HTML Tables, Forms and Frames
- HTML 5 and Cascading Style Sheets, Types of CSS
- Selector forms
- CSS with Color, Background, Font, Text and CSS Box Model
- Applying JavaScript - internal and external, I/O, Type Conversion
- JavaScript Conditional Statements and Loops, Pre-defined and User-defined Objects
- JavaScript Functions and Events
- Node.js

Sample Experiments:

1. Lists, Links and Images

a. Write a HTML program, to explain the working of lists.

Note: It should have an ordered list, unordered list, nested lists and ordered list in an unordered list and definition lists.

b. Write a HTML program, to explain the working of hyperlinks using <a> tag and href, target Attributes.

c. Create a HTML document that has your image and your friend's image with a specific height and width. Also when clicked on the images it should navigate to their respective profiles.

d. Write a HTML program, in such a way that, rather than placing large images on a page, the preferred technique is to use thumbnails by setting the height and width parameters to something like to 100*100 pixels. Each thumbnail image is also a link to a full sized version of the image. Create an image gallery using this

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technique

2. HTML Tables, Forms and Frames

- Write a HTML program, to explain the working of tables. (use tags: <table>, <tr>, <th>,

  <td> and attributes: border, rowspan, colspan)
- Write a HTML program, to explain the working of tables by preparing a timetable. (Note: Use <caption> tag to set the caption to the table & also use cell spacing, cell padding, border, rowspan, colspan etc.).
- Write a HTML program, to explain the working of forms by designing Registration form. (Note: Include text field, password field, number field, date of birth field, checkboxes, radio buttons, list boxes using <select>&<option> tags, <text area> and two buttons ie: submit and reset. Use tables to provide a better view).
- Write a HTML program, to explain the working of frames, such that page is to be divided into 3 parts on either direction. (Note: first frame image, second frame paragraph, third frame hyperlink. And also make sure of using "no frame" attribute such that frames to be fixed).

3. HTML 5 and Cascading Style Sheets, Types of CSS

a. Write a HTML program, that makes use of <article>, <aside>, <figure>, <figcaption>, <footer>, <header>, <main>, <nav>, <section>, , tags.

b. Write a HTML program, to embed audio and video into HTML web page.

c. Write a program to apply different types (or levels of styles or style specification formats)

- inline, internal, external styles to HTML elements. (identify selector, property and value).

4. Selector forms

a. Write a program to apply different types of selector forms

- Simple selector (element, id, class, group, universal)
- Combinator selector (descendant, child, adjacent sibling, general sibling)
- Pseudo-class selector
- Pseudo-element selector
- Attribute selector

5. CSS with Color, Background, Font, Text and CSS Box Model

a. Write a program to demonstrate the various ways you can reference a color in

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CSS.

b. Write a CSS rule that places a background image halfway down the page, tilting it horizontally. The image should remain in place when the user scrolls up or down.

c. Write a program using the following terms related to CSS font and text:

i. font-size ii. font-weight iii. font-style

iv. text-decoration v. text-transformation vi. text-alignment

d. Write a program, to explain the importance of CSS Box model using

i. Content ii. Border iii. Margin iv. padding

6. Applying JavaScript - internal and external, I/O, Type Conversion

a. Write a program to embed internal and external JavaScript in a web page.

b. Write a program to explain the different ways for displaying output.

c. Write a program to explain the different ways for taking input.

d. Create a webpage which uses prompt dialogue box to ask a voter for his name and age. Display the information in table format along with either the voter can vote or not

7. JavaScript Pre-defined and User-defined Objects

a. Write a program using document object properties and methods.

b. Write a program using window object properties and methods.

c. Write a program using array object properties and methods.

d. Write a program using math object properties and methods.

e. Write a program using string object properties and methods.

f. Write a program using regex object properties and methods.

g. Write a program using date object properties and methods.

h. Write a program to explain user-defined object by using properties, methods, accessors, constructors and display.

8. JavaScript Conditional Statements and Loops

a. Write a program which asks the user to enter three integers, obtains the numbers from the user and outputs HTML text that displays the larger number followed by the words "LARGER NUMBER" in an information message dialog. If the numbers are equal, output HTML text as "EQUAL NUMBERS".

b. Write a program to display week days using switch case.

c. Write a program to print 1 to 10 numbers using for, while and do-while loops.

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d. Write a program to print data in object using for-in, for-each and for-of loops

e. Develop a program to determine whether a given number is an 'ARMSTRONG NUMBER' or not. [Ex: 153 is an Armstrong number, since sum of the cube of the digits is equal to the number i.e.,13 + 53+ 33 = 153]

f. Write a program to display the denomination of the amount deposited in the bank in terms of 100's, 50's, 20's, 10's, 5's, 2's & 1's. (Ex: If deposited amount is Rs.163, the output should be 1-100's, 1-50's, 1- 10's, 1-2's & 1-1's)

9. Java script Functions and Events

a. Design a appropriate function should be called to display

- Factorial of that number
- Fibonacci series up to that number
- Prime numbers up to that number
- Is it palindrome or not

b. Design a HTML having a text box and four buttons named Factorial, Fibonacci, Prime, and Palindrome. When a button is pressed an appropriate function should be called to display

1. Factorial of that number
2. Fibonacci series up to that number
3. Prime numbers up to that number
4. Is it palindrome or not

c. Write a program to validate the following fields in a registration page

i. Name (start with alphabet and followed by alphanumeric and the length should not be less than 6 characters)

ii. Mobile (only numbers and length 10 digits)

iii. E-mail (should contain format like xxxxxxx@xxxxxx.xxx)

Text Books:

1. Programming the World Wide Web, 7th Edition, Robet W Sebesta, Pearson, 2013.
2. Web Programming with HTML5, CSS and JavaScript, John Dean, Jones & Bartlett Learning, 2019 (Chapters 1-11).
3. Pro MERN Stack: Full Stack Web App Development with Mongo, Express, React, and Node, Vasan Subramanian, 2nd edition, APress, O'Reilly.

Web Links:

1. https://www.w3schools.com/html

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2. https://www.w3schools.com/css
3. https://www.w3schools.com/js/
4. https://www.w3schools.com/nodejs
5. https://www.w3schools.com/typescript

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II Year II Semester

L	T	P	C
1	0	2	2

DESIGN THINKING & INNOVATION

Course Objectives: The objectives of the course are to

- Bring awareness on innovative design and new product development.
- Explain the basics of design thinking.
- Familiarize the role of reverse engineering in product development.
- Train how to identify the needs of society and convert into demand.
- Introduce product planning and product development process.

UNIT – I

Introduction to Design Thinking

Introduction to elements and principles of Design, basics of design-dot, line, shape, form as fundamental design components. Principles of design, Introduction to design thinking, history of Design Thinking, New materials in Industry

UNIT – II

Design Thinking Process

Design thinking process (empathize, analyze, idea & prototype), implementing the process in driving inventions, design thinking in social innovations. Tools of design thinking - person, costumer, journey map, brainstorming, product development

Activity: Every student presents their idea in three minutes, Every student can present design process in the form of flow diagram or flow chart etc. Every student should explain about product development.

UNIT – III

Innovation

Art of innovation, Difference between innovation and creativity, role of creativity and innovation in organizations, Creativity to Innovation, Teams for innovation, Measuring the impact and value of creativity

Activity: Debate on innovation and creativity, Flow and planning from idea to innovation, Debate on value-based innovation.

UNIT – IV

Product Design

Problem formation, introduction to product design, Product strategies, Product value, Product planning, product specifications. Innovation towards product design Case

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studies

Activity: Importance of modeling, how to set specifications, Explaining their own product design.

UNIT – V

Design Thinking in Business Processes

Design Thinking applied in Business & Strategic Innovation, Design Thinking principles that redefine business – Business challenges: Growth, Predictability, Change, Maintaining Relevance, Extreme competition, Standardization. Design thinking to meet corporate needs. Design thinking for Startups. Defining and testing Business Models and Business Cases. Developing & testing prototypes.

Activity: How to market our own product, about maintenance, Reliability and plan for startup.

Textbooks:

1. Tim Brown, Change by design, 1/e, Harper Bollins, 2009.
2. Idris Mootee, Design Thinking for Strategic Innovation, 1/e, Adams Media, 2014.

Reference Books:

1. David Lee, Design Thinking in the Classroom, Ulysses press, 2018.
2. Shrrutin N Shetty, Design the Future, 1/e, Norton Press, 2018.
3. William lidwell, Kritinaholden, &Jill butter, Universal principles of design, 2/e, Rockport Publishers, 2010.
4. Chesbrough.H, The era of open innovation, 2003.

Online Learning Resources:

- https://nptel.ac.in/courses/110/106/110106124/
- https://nptel.ac.in/courses/109/104/109104109/
- https://swayam.gov.in/nd1_noc19_mg60/preview
- https://onlinecourses.nptel.ac.in/noc22_de16/preview

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Department of Artificial Intelligence and Data Science

Course Outcomes:

COs	Statements	Blooms Level
CO1	Define the concepts related to design thinking.	L1
CO2	Explain the fundamentals of Design Thinking and innovation.	L2
CO3	Apply the design thinking techniques for solving problems in various sectors.	L3
CO4	Analyze to work in a multidisciplinary environment.	L4
CO5	Evaluate the value of creativity.	L5

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Department of Artificial Intelligence and Data Science

II Year I Semester

L	T	P	C
2	0	0	--

ENVIRONMENTAL SCIENCE

Course Objectives:

- To make the students to get awareness on environment
- To understand the importance of protecting natural resources, ecosystems for future generations and pollution causes due to the day-to-day activities of human life
- To save earth from the inventions by the engine

UNTI-I:

Multidisciplinary Nature of Environmental Studies: – Definition, Scope and Importance – Need for Public Awareness.

Natural Resources: Renewable and non-renewable resources – Natural resources and associated problems – Forest resources – Use and over – exploitation, deforestation, case studies – Timber extraction – Mining, dams and other effects on forest and tribal people – Water resources – Use and over utilization of surface and ground water – Floods, drought, conflicts over water, dams – benefits and problems.

Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies

Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies. – Energy resources:

UNTI-II:

Ecosystems: Concept of an ecosystem. – Structure and function of an ecosystem – Producers, consumers and decomposers – Energy flow in the ecosystem – Ecological succession – Food chains, food webs and ecological pyramids – Introduction, types, characteristic features, structure and function of the following ecosystem:

a. Forest ecosystem.

b. Grassland ecosystem

c. Desert ecosystem

d. Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)

Biodiversity and Its Conservation : Introduction and Definition: genetic, species and ecosystem diversity – Bio-geographical classification of India – Value of biodiversity: consumptive use, Productive use, social, ethical, aesthetic and option values – Biodiversity at global, National and local levels – India as a mega-diversity nation – Hot-sports of biodiversity – Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts – Endangered and endemic species of India – Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.

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UNTI-III:

Environmental Pollution: Definition, Cause, effects and control measures of:

a. Air Pollution

b. Water pollution

c. Soil pollution

d. Marine pollution

e. Noise pollution

f. Thermal pollution

g. Nuclear hazards

Solid Waste Management: Causes, effects and control measures of urban and industrial wastes – Role of an individual in prevention of pollution – Pollution case studies – Disaster management: floods, earthquake, cyclone and landslides.

UNTI-IV:

Social Issues and the Environment: From Unsustainable to Sustainable development – Urban problems related to energy – Water conservation, rain water harvesting, watershed management – Resettlement and rehabilitation of people; its problems and concerns. Case studies – Environmental ethics: Issues and possible solutions – Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case Studies – Wasteland reclamation. – Consumerism and waste products. – Environment Protection Act. – Air (Prevention and Control of Pollution) Act. – Water (Prevention and control of Pollution) Act – Wildlife Protection Act – Forest Conservation Act – Issues involved in enforcement of environmental legislation – Public awareness.

UNTI-V:

Human Population and The Environment: Population growth, variation among nations. Population explosion – Family Welfare Programmes. – Environment and human health – Human Rights – Value Education – HIV/AIDS – Women and Child Welfare – Role of information Technology in Environment and human health – Case studies.

Field Work: Visit to a local area to document environmental assets River/forest grassland/hill/mountain – Visit to a local polluted site-Urban/Rural/Industrial /Agricultural Study of common plants, insects, and birds – river, hill slopes, etc.

Textbooks:

1. Erach Bharucha,Text book of Environmental Studies for Undergraduate Courses,Universities Press (India) Private Limited, 2019.
2. Palaniswamy, Environmental Studies, 2/e, Pearson education, 2014.
3. S.Azeem Unnisa, Environmental Studies, Academic Publishing Company, 2021.

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4. K.Raghavan Nambiar, "Text book of Environmental Studies for Undergraduate Courses as per UGC model syllabus", SciTech Publications (India), Pvt. Ltd, 2010.

Reference Books:

1. Deeksha Dave and E.Sai Baba Reddy, Textbook of Environmental Science, 2/e, Cengage Publications, 2012.
2. M.Anji Reddy, "Textbook of Environmental Sciences and Technology", BS Publication, 2014.
3. J.P. Sharma, Comprehensive Environmental studies, Laxmi publications, 2006.
4. J. Glynn Henry and Gary W. Heinke, Environmental Sciences and Engineering, Prentice Hall of India Private limited, 1988.
5. G.R. Chatwal, A Text Book of Environmental Studies, Himalaya Publishing House, 2018.
6. Gilbert M. Masters and Wendell P. Ela, Introduction to Environmental Engineering and Science, 1/e, Prentice Hall of India Private limited, 1991.

Online Learning Resources:

- https://onlinecourses.nptel.ac.in/noc23_hs155/preview
- https://www.edx.org/learn/environmental-science/rice-university-ap-r-environmental-science-part-3-pollution-and-resources?index=product&objectID=course-3a6da9f2-d84c-4773-8388-1b2f8f6a75f2&webview=false&campaign=AP%C2%AE+Environmental+Science
- http://ecoursesonline.iasri.res.in/Courses/Environmental%20Science-I/Data%20Files/pdf/lec07.pdf
- https://www.youtube.com/watch?v=5QxxaVfgQ3k

COs	Statements	Blooms Level
CO1	Grasp multi-disciplinary nature of environmental studies and various renewable and non-renewable resources.	L2
CO2	Understand flow and bio-geo- chemical cycles and ecological pyramids.	L2
CO3	Understand various causes of pollution and solid waste management and related preventive measures.	L2
CO4	Understand the rainwater harvesting, watershed management, ozone layer depletion and waste land reclamation.	L2
CO5	Illustrate the causes of population explosion, value education and welfare programmes.	L3

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B. Tech – II Year II Semester

S. No	Category	Course Code	Title	L	T	P	Credits
1	Management Course- I	23HM22T01	Managerial Economic and Financial Analysis	2	0	0	2
2	Engineering Science/ Basic Science	23BS22T03	Statistical methods for Data science	3	0	0	3
3	Professional Core	23AD22T01	Artificial Intelligence	3	0	0	3
4	Professional Core	23AD22T02	Introduction to Data Science	3	0	0	3
5	Professional Core	23AM22T01	Digital Logic & Computer Organization	3	0	0	3
6	Professional Core	23AD22L01	Artificial Intelligence Lab	0	0	3	1.5
7	Professional Core	23AD22L02	Data Science using Python Lab	0	0	3	1.5
8	Skill Enhancement course	23AD22S01	Full Stack Development-1	0	1	2	2
9	BS&H	23BS22L01	Design Thinking & Innovation	1	0	2	2
Total				**15**	**1**	**10**	**21**
Mandatory Community Service Project Internship of 08 weeks duration during summer vacation							

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Department of Artificial Intelligence and Data Science

II Year II Semester

L	T	P	C
3	0	0	3

ARTIFICIAL INTELLIGENCE

Pre-requisite:

1. Knowledge in Computer Programming.
2. A course on "Mathematical Foundations of Computer Science".
3. Background in linear algebra, data structures and algorithms, and probability.

Course Objectives:

1. The student should be made to study the concepts of Artificial Intelligence.
2. The student should be made to learn the methods of solving problems using Artificial Intelligence.
3. The student should be made to introduce the concepts of Expert Systems.
4. To understand the applications of AI, namely game playing, theorem proving, and machine learning.
5. To learn different knowledge representation techniques

UNIT – I:

Introduction: AI problems, foundation of AI and history of AI intelligent agents: Agents and Environments, the concept of rationality, the nature of environments, structure of agents, problem solving agents, problem formulation.

UNIT – II:

Searching- Searching for solutions, uniformed search strategies – Breadth first search, depth first Search. Search with partial information (Heuristic search) Hill climbing, A* ,AO* Algorithms, Problem reduction, Game Playing-Adversial search, Games, mini-max algorithm, optimal decisions in multiplayer games, Problem in Game playing, Alpha-Beta pruning, Evaluation functions

UNIT – III:

Representation of Knowledge: Knowledge representation issues, predicate logic-logic programming, semantic nets- frames and inheritance, constraint propagation, representing knowledge using rules, rules based deduction systems. Reasoning under uncertainty, review of probability, Bayes' probabilistic interferences and dempstershafer theory

UNIT – IV:

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Logic concepts: First order logic. Inference in first order logic, propositional vs. first order inference, unification & lifts forward chaining, Backward chaining, Resolution, Learning from observation Inductive learning, Decision trees, Explanation based learning, Statistical Learning methods, Reinforcement Learning.

UNIT – V:

Expert Systems: Architecture of expert systems, Roles of expert systems – Knowledge Acquisition Meta knowledge Heuristics. Typical expert systems – MYCIN, DART, XCON: Expert systems shells.

Textbooks:

1. S. Russel and P. Norvig, "Artificial Intelligence – A Modern Approach", SecondEdition, Pearson Education.
2. Kevin Night and Elaine Rich, Nair B., "Artificial Intelligence (SIE)", Mc Graw Hill

Reference Books:

1. David Poole, Alan Mackworth, Randy Goebel,"Computational Intelligence: a logicalapproach", Oxford University Press.
2. G. Luger, "Artificial Intelligence: Structures and Strategies for complex problem solving", Fourth Edition, Pearson Education.
3. J. Nilsson, "Artificial Intelligence: A new Synthesis", Elsevier Publishers.
4. Artificial Intelligence, SarojKaushik, CENGAGE Learning.

Online Learning Resources:

1. https://ai.google/
2. https://swayam.gov.in/nd1_noc19_me71/preview

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II Year II Semester

L	T	P	C
3	0	0	3

INTRODUCTION TO DATA SCIENCE

COURSE OBJECTIVES: From the course the student will learn

1. Knowledge and expertise to become a data scientist.
2. Essential concepts of statistics and machine learning that are vital for data science;
3. Significance of exploratory data analysis (EDA) in data science.
4. Critically evaluate data visualizations presented on the dashboards
5. Suitability and limitations of tools and techniques related to data science process

UNIT I:

Introduction to Data science, benefits and uses, facets of data, data science process in brief, big data ecosystem and data science

Data Science process: Overview, defining goals and creating project charter, retrieving data, cleansing, integrating and transforming data, exploratory analysis, model building, presenting findings and building applications on top of them

Unit II:

Applications of machine learning in Data science, role of ML in DS, Python tools like sklearn, modelling process for feature engineering, model selection, validation and prediction, types of ML, semi-supervised learning

Handling large data: problems and general techniques for handling large data, programming tips for dealing large data, case studies on DS projects for predicting malicious URLs, for building recommender systems

UNIT III:

NoSQL movement for handling Bigdata: Distributing data storage and processing with Hadoop framework, case study on risk assessment for loan sanctioning, ACID principle of relational databases, CAP theorem, base principle of NoSQL databases, types of NoSQL databases, case study on disease diagnosis and profiling

UNIT IV:

Tools and Applications of Data Science: Introducing **Neo4j** for dealing with graph databases, graph query language **Cypher**, Applications graph databases, Python libraries like nltk and SQLite for handling Text mining and analytics, case study on classifying Reddit posts

UNIT V:

Data Visualization and Prototype Application Development: Data Visualization options, Crossfilter, the JavaScript MapReduce library, Creating an interactive dashboard with dc.js, Dashboard development tools.

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Department of Artificial Intelligence and Data Science

Applying the Data Science process for real world problem solving scenarios as a detailed case study

Textbook:

1. Davy Cielen, Arno D.B.Meysman, and Mohamed Ali, "Introducing to Data Scienceusing Python tools", Manning Publications Co, Dreamtech press, 2016
2. Prateek Gupta, "Data Science with Jupyter" BPB publishers, 2019 for basics

Reference Books:

1. Joel Grus, "Data Science From Scratch", OReilly, 2019
2. Doing Data Science: Straight Talk From The Frontline, 1 st Edition, Cathy O'Neil and Rachel Schutt, O'Reilly, 2013

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Department of Artificial Intelligence and Data Science

II Year II Semester

L	T	P	C
3	0	0	3

DIGITAL LOGIC & COMPUTER ORGANIZATION

Course Objectives:

The main objectives of the course is to

- provide students with a comprehensive understanding of digital logic design principles and computer organization fundamentals
- Describe memory hierarchy concepts
- Explain input/output (I/O) systems and their interaction with the CPU, memory, and peripheral devices

UNIT – I:

Data Representation: Binary Numbers Fixed Point Representation. Floating Point Representation, Number base conversions, Octal and Hexadecimal Numbers, components, Signed binary numbers, Binary codes

Digital Logic Circuits-I: Basic Logic Functions, Logic gates, universal logic gates, Minimization of Logic expressions. K-Map Simplification, Combinational Circuits, Decoders, Multiplexers

UNIT – II:

Digital Logic Circuits-II: Sequential Circuits, Flip-Flops, Binary counters, Registers, Shift Registers, Ripple counters

Basic Structure of Computers: Computer Types, Functional units, Basic operational concepts, Bus structures, Software, Performance, multiprocessors and multi computers, Computer Generations, Von- Neumann Architecture

UNIT – III:

Computer Arithmetic : Addition and Subtraction of Signed Numbers, Design of Fast Adders, Multiplication of Positive Numbers, Signed-operand Multiplication, Fast Multiplication, Integer Division, Floating-Point Numbers and Operations

Processor Organization: Fundamental Concepts, Execution of a Complete Instruction, Multiple-Bus Organization, Hardwired Control and Multi programmed Control

UNIT – IV:

The Memory Organization: Basic Concepts, Semiconductor RAM Memories, Read-Only Memories, Speed, Size and Cost, Cache Memories, Performance Considerations, Virtual Memories, Memory Management Requirements, Secondary Storage

UNIT – V:

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Input/output Organization: Accessing I/O Devices, Interrupts, Processor Examples, Direct Memory Access, Buses, Interface Circuits, Standard I/O Interfaces

Textbooks:

1. Computer Organization, Carl Hamacher, Zvonko Vranesic, Safwat Zaky, 6th edition, McGraw Hill, 2023.
2. Digital Design, 6th Edition, M. Morris Mano, Pearson Education, 2018.
3. Computer Organization and Architecture, William Stallings, 11thEdition, Pearson, 2022.

Reference Books:

1. Computer Systems Architecture, M. Moris Mano, 3rd Edition, Pearson, 2017
2. Computer Organization and Design, David A. Paterson, John L. Hennessy, Elsevier, 2004.
3. Fundamentals of Logic Design, Roth, 5thEdition, Thomson, 2003

Online Learning Resources:
https://nptel.ac.in/courses/106/103/106103068/

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Department of Artificial Intelligence and Data Science

II Year II Semester

L	T	P	C
0	0	3	1.5

ARTIFICIAL INTELLIGENCE LAB

Pre-requisite:

1. Knowledge in Computer Programming.
2. Background in linear algebra, data structures and algorithms, and probability

Course Objectives:

1. The student should be made to study the concepts of Artificial Intelligence.
2. The student should be made to learn the methods of solving problems using Artificial Intelligence.
3. The student should be made to introduce the concepts of Expert Systems and machine learning.

List of Experiments:

1. Pandas Library
   a) Write a python program to implement Pandas Series with labels.
   b) Create a Pandas Series from a dictionary.
   c) Creating a Pandas Data Frame.
   d) Write a program which makes use of the following Pandas methods
      i)describe () ii) head () iii) tail () iv) info ()
2. Pandas Library: Visualization
   a) Write a program which use pandas inbuilt visualization to plot following graphs:
      i. Bar plots ii. Histograms iii) Line plots iv) Scatter plots
3. Write a Program to Implement Breadth First Search using Python.
4. Write a program to implement Best First Searching Algorithm
5. Write a Program to Implement Depth First Search using Python.
6. Write a program to implement the Heuristic Search
7. Write a python program to implement A* and AO* algorithm. (Ex: find the shortest path)
8. Write a Program to Implement Water-Jug problem using Python.
9. Write a Program to Implement Alpha-Beta Pruning using Python.
10. Write a Program to implement 8-Queens Problem using Python.

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11. Write a program to schedule a meeting among a 5 busy people using Default Reasoning the output should give the time, place and day of the meeting.
12. Write a program to implement the Unification algorithm
13. Develop a knowledge base system consisting of facts and rules about some specialized knowledge domain
14. Write a program to implement 8 puzzle programs using different heuristics. Using it play the game Tic-Tac-Toe at the end the game the program should display the no. of nodes generated, cutoff values at each stage in the form of a table.

Textbooks:

1. Prateek Joshi, Artificial Intelligence with Python, Packt Publishing, 2017.
2. Xiao, Perry. Artificial intelligence programming with Python: from zero to hero. JohnWiley & Sons, 2022.

Reference Books:

1. Stuart J. Russell and Peter Norvig, Artificial Intelligence A Modern Approach, Fourth Edition, Pearson, 2020
2. Martin C. Brown (Author), "Python: The Complete Reference" McGraw Hill Education, Fourth edition, 2018
3. R. Nageswara Rao , "Core Python Programming" Dreamtech Press India Pvt Ltd 2018.

Online Learning Resources:

1. https://onlinecourses.nptel.ac.in/noc19_cs40/preview
2. https://onlinecourses.nptel.ac.in/noc19_cs41/preview

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B. TECH - ARTIFICIAL INTELLIGENCE & DATA SCIENCE (MR23-IInd YEAR COURSE STRUCTURE & SYLLABUS)

B. Tech - II Year I Semester

S. No	Category	Course Code	Title	L	T	P	Credits
1	BS&H	23BS21T01	Discrete Mathematics & Graph Theory	3	0	0	3
2	BS&H	23HM21T01	Universal human values – understanding harmony and Ethical human conduct	2	1	0	3
3	Engineering Science	23ES21T04	Database Management Systems	3	0	0	3
4	Professional Core	23CS21T01	Advanced Data Structures & Algorithms Analysis	3	0	0	3
5	Professional Core	23CS21T02	Object Oriented Programming Through Java	3	0	0	3
6	Professional Core	23CS21L01	Advanced Data Structures and Algorithms Analysis Lab	0	0	3	1.5
7	Professional Core	23CS21L02	Object Oriented Programming Through Java Lab	0	0	3	1.5
8	Skill Enhancement course	23CS21S01	Python Programming Lab	0	1	2	2
9	Audit Course	23BS21T01	Environmental Science	2	0	0	-
Total				**16**	**2**	**8**	**20**

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B. Tech – II Year II Semester

S. No	Category	Course Code	Title	L	T	P	Credits
1	Management Course- I	23HM22T01	Managerial Economic and Financial Analysis	2	0	0	2
2	Engineering Science/ Basic Science	23BS22T03	Statistical methods for Data science	3	0	0	3
3	Professional Core	23AD22T01	Artificial Intelligence	3	0	0	3
4	Professional Core	23AD22T02	Introduction to Data Science	3	0	0	3
5	Professional Core	23AM22T01	Digital Logic & Computer Organization	3	0	0	3
6	Professional Core	23AD22L01	Artificial Intelligence Lab	0	0	3	1.5
7	Professional Core	23AD22L02	Data Science using Python Lab	0	0	3	1.5
8	Skill Enhancement course	23AD22S01	Full Stack Development-1	0	1	2	2
9	BS&H	23BS22L01	Design Thinking & Innovation	1	0	2	2
Total				**15**	**1**	**10**	**21**
Mandatory Community Service Project Internship of 08 weeks duration during summer vacation							

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Department of Artificial Intelligence and Data Science

II Year I Semester

L	T	P	C
3	0	0	3

DATABASE MANAGEMENT SYSTEMS

Course Objectives:

The main objectives of the course is to

- Introduce database management systems and to give a good formal foundation on the relational model of data and usage of Relational Algebra
- Introduce the concepts of basic SQL as a universal Database language
- Demonstrate the principles behind systematic database design approaches by covering conceptual design, logical design through normalization
- Provide an overview of physical design of a database system, by discussing Database indexing techniques and storage techniques

UNIT I:

Introduction: Database system, Characteristics (Database Vs File System), Database Users, Advantages of Database systems, Database applications. Brief introduction of different Data Models; Concepts of Schema, Instance and data independence; Three tier schema architecture for data independence; Database system structure, environment, Centralized and Client Server architecture for the database.

Entity Relationship Model: Introduction, Representation of entities, attributes, entity set, relationship, relationship set, constraints, sub classes, super class, inheritance, specialization, generalization using ER Diagrams.

Unit II:

Relational Model: Introduction to relational model, concepts of domain, attribute, tuple, relation, importance of null values, constraints (Domain, Key constraints, integrity constraints) and their importance, Relational Algebra, Relational Calculus. BASIC SQL:Simple Database schema, data types, table definitions (create, alter), different DML operations (insert, delete, update).

UNIT III:

SQL: Basic SQL querying (select and project) using where clause, arithmetic & logical operations, SQL functions(Date and Time, Numeric, String conversion).Creating tables with relationship, implementation of key and integrity constraints, nested queries, sub queries, grouping, aggregation, ordering, implementation of different types of joins, view(updatable and non-updatable), relational set operations.

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UNIT IV:

Schema Refinement (Normalization): Purpose of Normalization or schema refinement, concept of functional dependency, normal forms based on functional dependency Lossless join and dependency preserving decomposition, (1NF, 2NF and 3 NF), concept of surrogate key, Boyce-Codd normal form(BCNF), MVD, Fourth normal form(4NF), Fifth Normal Form (5NF).

UNIT V:

Transaction Concept: Transaction State, ACID properties, Concurrent Executions, Serializability, Recoverability, Implementation of Isolation, Testing for Serializability, lock based, time stamp based, optimistic, concurrency protocols, Deadlocks, Failure Classification, Storage, Recovery and Atomicity, Recovery algorithm.

Introduction to Indexing Techniques: B+ Trees, operations on B+Trees, Hash Based Indexing:

Text Books:

1. Database Management Systems, 3rd edition, Raghurama Krishnan, Johannes Gehrke, TMH (For Chapters 2, 3, 4)
2. Database System Concepts, 5th edition, Silberschatz, Korth, Sudarsan, TMH (For Chapter 1 and Chapter 5)

Reference Books:

1. Introduction to Database Systems, 8thedition, C J Date, Pearson.
2. Database Management System, 6th edition, RamezElmasri, Shamkant B. Navathe, Pearson
3. Database Principles Fundamentals of Design Implementation and Management, Corlos Coronel, Steven Morris, Peter Robb, Cengage Learning.

Web-Resources:

1. https://nptel.ac.in/courses/106/105/106105175/

2.https://infyspringboard.onwingspan.com/web/en/app/toc/lex_auth_01275806667282022456_shared/overview

MR23

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Department of Artificial Intelligence and Data Science

II Year I Semester

L	T	P	C
3	0	0	3

ADVANCED DATA STRUCTURES & ALGORITHM ANALYSIS

Course Objectives:

The main objectives of the course is to

- provide knowledge on advance data structures frequently used in Computer Science domain
- Develop skills in algorithm design techniques popularly used
- Understand the use of various data structures in the algorithm design

UNIT – I:

Introduction to Algorithm Analysis, Space and Time Complexity analysis, Asymptotic Notations

AVL Trees – Creation, Insertion, Deletion operations and Applications B-Trees – Creation, Insertion, Deletion operations and Applications

UNIT – II:

Heap Trees (Priority Queues) – Min and Max Heaps, Operations and Applications

Graphs – Terminology, Representations, Basic Search and Traversals, Connected Components and Biconnected Components, applications

Divide and Conquer: The General Method, Quick Sort, Merge Sort, Strassen's matrixmultiplication, Convex Hull

UNIT – III:

Greedy Method: General Method, Job Sequencing with deadlines, Knapsack Problem, Minimum cost spanning trees, Single Source Shortest Paths

Dynamic Programming: General Method, All pairs shortest paths, Single Source Shortest Paths – General Weights (Bellman Ford Algorithm), Optimal Binary Search Trees, 0/1 Knapsack, String Editing, Travelling Salesperson problem

UNIT – IV:

Backtracking: General Method, 8-Queens Problem, Sum of Subsets problem, Graph Coloring, 0/1 Knapsack Problem

Branch and Bound: The General Method, 0/1 Knapsack Problem, Travelling Salesperson problem

UNIT – V:

NP Hard and NP Complete Problems: Basic Concepts, Cook's theorem

NP Hard Graph Problems: Clique Decision Problem (CDP), Chromatic Number Decision Problem (CNDP), Traveling Salesperson Decision Problem (TSP)

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NP Hard Scheduling Problems: Scheduling Identical Processors, Job Shop Scheduling

Textbooks:

1. Fundamentals of Data Structures in C++, Horowitz, Ellis; Sahni, Sartaj; Mehta, Dinesh 2nd Edition Universities Press
2. Computer Algorithms/C++ Ellis Horowitz, Sartaj Sahni, Sanguthevar Rajasekaran2nd Edition University Press

Reference Books:

1. Data Structures and program design in C, Robert Kruse, Pearson Education Asia
2. An introduction to Data Structures with applications, Trembley & Sorenson, McGraw Hill
3. The Art of Computer Programming, Vol.1: Fundamental Algorithms, Donald E Knuth, Addison-Wesley, 1997.
4. Data Structures using C & C++: Langsam, Augenstein & Tanenbaum, Pearson, 1995
5. Algorithms + Data Structures & Programs:, N.Wirth, PHI
6. Fundamentals of Data Structures in C++: Horowitz Sahni & Mehta, Galgottia Pub.
7. Data structures in Java:, Thomas Standish, Pearson Education Asia

Online Learning Resources:

1. https://www.tutorialspoint.com/advanced_data_structures/index.asp
2. http://peterindia.net/Algorithms.html
3. Abdul Bari, 1. Introduction to Algorithms (youtube.com)

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II Year I Semester

L	T	P	C
3	0	0	3

OBJECT-ORIENTED PROGRAMMING THROUGH JAVA

Course Objectives:

The learning objectives of this course are to:

- Identify Java language components and how they work together in applications
- Learn the fundamentals of object-oriented programming in Java, including defining classes, invoking methods, using class libraries.
- Learn how to extend Java classes with inheritance and dynamic binding and how to use exception handling in Java applications
- Understand how to design applications with threads in Java
- Understand how to use Java APIs for program development

UNIT I:

Object Oriented Programming: Basic concepts, Principles, Program Structure in Java: Introduction, Writing Simple Java Programs, Elements or Tokens in Java Programs, Java Statements, Command Line Arguments, User Input to Programs, Escape Sequences Comments, Programming Style.

Data Types, Variables, and Operators: Introduction, Data Types in Java, Declaration of Variables, Data Types, Type Casting, Scope of Variable Identifier, Literal Constants, Symbolic Constants, Formatted Output with printf() Method, Static Variables and Methods, Attribute Final, Introduction to Operators, Precedence and Associativity of Operators, Assignment Operator (=), Basic Arithmetic Operators, Increment (++) and Decrement (- -) Operators, Ternary Operator, Relational Operators, Boolean Logical Operators, Bitwise Logical Operators.

Control Statements: Introduction, if Expression, Nested if Expressions, if–else Expressions, Ternary Operator?:, Switch Statement, Iteration Statements, while Expression, do–while Loop, for Loop, Nested for Loop, For–Each for Loop, Break Statement, Continue Statement.

UNIT II:

Classes and Objects: Introduction, Class Declaration and Modifiers, Class Members, Declaration of Class Objects, Assigning One Object to Another, Access Control for Class Members, Accessing Private Members of Class, Constructor Methods for Class, Overloaded Constructor Methods, Nested Classes, Final Class and Methods, Passing Arguments by Value and by Reference, Keyword this.

Methods: Introduction, Defining Methods, Overloaded Methods, Overloaded Constructor Methods, Class Objects as Parameters in Methods, Access Control,

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Recursive Methods, Nesting of Methods, Overriding Methods, Attributes Final and Static.

UNIT III:

Arrays: Introduction, Declaration and Initialization of Arrays, Storage of Array in Computer Memory, Accessing Elements of Arrays, Operations on Array Elements, Assigning Array to Another Array, Dynamic Change of Array Size, Sorting of Arrays, Search for

Values in Arrays, Class Arrays, Two-dimensional Arrays, Arrays of Varying Lengths, Three- dimensional Arrays, Arrays as Vectors

Inheritance: Introduction, Process of Inheritance, Types of Inheritances, Universal Super Class-Object Class, Inhibiting Inheritance of Class Using Final, Access Control and Inheritance, Multilevel Inheritance, Application of Keyword Super, Constructor Method and Inheritance, Method Overriding, Dynamic Method Dispatch, Abstract Classes, Interfaces and Inheritance.

Interfaces: Introduction, Declaration of Interface, Implementation of Interface, Multiple Interfaces, Nested Interfaces, Inheritance of Interfaces, Default Methods in Interfaces, Static Methods in Interface, Functional Interfaces, Annotations.

UNIT IV:

Packages and Java Library: Introduction, Defining Package, Importing Packages and Classes into Programs, Path and Class Path, Access Control, Packages in Java SE, Java.lang Package and its Classes, Class Object, Enumeration, class Math, Wrapper Classes, Auto-boxing and Auto-unboxing, Java util Classes and Interfaces, Formatter Class, Random Class, Time Package, Class Instant (java.time.Instant), Formatting for Date/Time in Java, Temporal Adjusters Class, Temporal Adjusters Class.

Exception Handling: Introduction, Hierarchy of Standard Exception Classes, Keywords throws and throw, try, catch, and finally Blocks, Multiple Catch Clauses, Class Throwable, Unchecked Exceptions, Checked Exceptions.

Java I/O and File: Java I/O API, standard I/O streams, types, Byte streams, Character streams, Scanner class, Files in Java(Text Book 2)

UNIT V:

String Handling in Java: Introduction, Interface Char Sequence, Class String, Methods for Extracting Characters from Strings, Comparison, Modifying, Searching; Class String Buffer.

Multithreaded Programming: Introduction, Need for Multiple Threads Multithreaded Programming for Multi-core Processor, Thread Class, Main Thread-Creation of New Threads, Thread States, Thread Priority-Synchronization, Deadlock and Race Situations, Inter-thread Communication - Suspending, Resuming, and Stopping of Threads.

Java Database Connectivity: Introduction, JDBC Architecture, Installing MySQL

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and MySQL Connector/J, JDBC Environment Setup, Establishing JDBC Database Connections, ResultSet Interface

Java FX GUI: Java FX Scene Builder, Java FX App Window Structure, displaying text and image, event handling, laying out nodes in scene graph, mouse events (Text Book 3)

Text Books:

1. JAVA one step ahead, Anitha Seth, B.L.Juneja, Oxford.
2. Joy with JAVA, Fundamentals of Object Oriented Programming, Debasis Samanta, Monalisa Sarma, Cambridge, 2023.
3. JAVA 9 for Programmers, Paul Deitel, Harvey Deitel, 4th Edition, Pearson.

References Books:

1. The complete Reference Java, 11thedition, Herbert Schildt,TMH
2. Introduction to Java programming, 7th Edition, Y Daniel Liang, Pearson

Online Resources:

1. https://nptel.ac.in/courses/106/105/106105191/
2. https://infyspringboard.onwingspan.com/web/en/app/toc/lex_auth_012880464547618816347_shared/overview

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II Year I Semester

L	T	P	C
0	0	3	1.5

ADVANCED DATA STRUCTURES & ALGORITHM ANALYSIS LAB

Course Objectives:

The objectives of the course is to

- acquire practical skills in constructing and managing Data structures
- apply the popular algorithm design methods in problem-solving scenarios

Experiments covering the Topics:

- Operations on AVL trees, B-Trees, Heap Trees
- Graph Traversals
- Sorting techniques
- Minimum cost spanning trees
- Shortest path algorithms
- 0/1 Knapsack Problem
- Travelling Salesperson problem
- Optimal Binary Search Trees
- N-Queens Problem
- Job Sequencing

Sample Programs:

1. Construct an AVL tree for a given set of elements which are stored in a file. And implement insert and delete operation on the constructed tree. Write contents of tree into a new file using in-order.
2. Construct B-Tree an order of 5 with a set of 100 random elements stored in array. Implement searching, insertion and deletion operations.
3. Construct Min and Max Heap using arrays, delete any element and display the contentof the Heap.
4. Implement BFT and DFT for given graph, when graph is represented by
   a) Adjacency Matrix b) Adjacency Lists
5. Write a program for finding the bi-connected components in a given graph.
6. Implement Quick sort and Merge sort and observe the execution time for various input sizes (Average, Worst and Best cases).
7. Compare the performance of Single Source Shortest Paths using Greedy

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method when the graph is represented by adjacency matrix and adjacency lists.

8. Implement Job sequencing with deadlines using Greedy strategy.
9. Write a program to solve 0/1 Knapsack problem Using Dynamic Programming.
10. Implement N-Queens Problem Using Backtracking.
11. Use Backtracking strategy to solve 0/1 Knapsack problem.
12. Implement Travelling Sales Person problem using Branch and Bound approach.

Reference Books:

1. Fundamentals of Data Structures in C++, Horowitz Ellis, Sahni Sartaj, Mehta, Dinesh, 2ndEdition, Universities Press
2. Computer Algorithms/C++ Ellis Horowitz, Sartaj Sahni, Sanguthevar Rajasekaran, 2ndEdition, University Press
3. Data Structures and program design in C, Robert Kruse, Pearson Education Asia
4. An introduction to Data Structures with applications, Trembley& Sorenson, McGrawHill

Online Learning Resources:

1. http://cse01-iiith.vlabs.ac.in/
2. http://peterindia.net/Algorithms.html

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II Year I Semester

L	T	P	C
0	0	3	1.5

OBJECT-ORIENTED PROGRAMMING THROUGH JAVA LAB

Course Objectives:

The aim of this course is to

- Practice object-oriented programming in the Java programming language
- Implement, Classes, Objects, Methods, Inheritance, Exception, Runtime Polymorphism, User defined Exception handling mechanism
- Illustrate inheritance, Exception handling mechanism, JDBC connectivity
- Construct Threads, Event Handling, implement packages, Java FX GUI

Experiments covering the Topics:

- Object Oriented Programming fundamentals- data types, control structures
- Classes, methods, objects, Inheritance, polymorphism,
- Exception handling, Threads, Packages, Interfaces
- Files, I/O streams, JavaFX GUI

Sample Experiments:

Exercise – 1:

a) Write a JAVA program to display default value of all primitive data type of JAVA

b) Write a java program that display the roots of a quadratic equation $ax^2+bx=0$. Calculate the discriminate D and basing on value of D, describe the nature of root.

Exercise - 2

a) Write a JAVA program to search for an element in a given list of elements using binary search mechanism.

b) Write a JAVA program to sort for an element in a given list of elements using bubble sort

c) Write a JAVA program using StringBuffer to delete, remove character.

Exercise - 3

a) Write a JAVA program to implement class mechanism. Create a class, methods and invoke them inside main method.

b) Write a JAVA program implements method overloading.

c) Write a JAVA program to implement constructor.

d) Write a JAVA program to implement constructor overloading.

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Exercise - 4

a) Write a JAVA program to implement Single Inheritance

b) Write a JAVA program to implement multi-level Inheritance

c) Write a JAVA program for abstract class to find areas of different shapes

Exercise - 5

a) Write a JAVA program give example for "super" keyword.

b) Write a JAVA program to implement Interface. What kind of Inheritance can be achieved?

c) Write a JAVA program that implements Runtime polymorphism

Exercise - 6

a) Write a JAVA program that describes exception handling mechanism

b) Write a JAVA program Illustrating Multiple catch clauses

- Write a JAVA program for creation of Java Built-in Exceptions
- Write a JAVA program for creation of User Defined Exception

Exercise - 7

a) Write a JAVA program that creates threads by extending Thread class. First thread display "Good Morning "every 1 sec, the second thread displays "Hello "every 2 seconds and the third display "Welcome" every 3 seconds, (Repeat the same by implementing Runnable)

b) Write a program illustrating **is Alive** and **join ()**

c) Write a Program illustrating Daemon Threads.

d) Write a JAVA program Producer Consumer Problem

Exercise – 8

1. Write a JAVA program that import and use the user defined packages
2. Without writing any code, build a GUI that display text in label and image in anImageView (use JavaFX)
3. Build a Tip Calculator app using several JavaFX components and learn how to respond touser interactions with the GUI

Exercise – 9

1. Write a java program that connects to a database using JDBC
2. Write a java program to connect to a database using JDBC and insert values into it.
3. Write a java program to connect to a database using JDBC and delete values from it

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Reference Book(s)

1. Java: A Beginner's Guide by Herbert Schildt
2. Head First Java by Kathy Sierra and Bert Bates
3. JAVA -The Complete Reference Java - Hebert Schildt, 9th Edition, Mc Graw Hill Education

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II Year I Semester

L	T	P	C
0	1	2	2

PYTHON PROGRAMMING

(Skill Enhancement Course)

Course Objectives:
The main objectives of the course are to

- Introduce core programming concepts of Python programming language.
- Demonstrate about Python data structures like Lists, Tuples, Sets and dictionaries
- Implement Functions, Modules and Regular Expressions in Python Programmingand to create practical and contemporary applications using these

UNTI-I:
History of Python Programming Language, Thrust Areas of Python, Installing Anaconda Python Distribution, Installing and Using Jupiter Notebook

Parts of Python Programming Language: Identifiers, Keywords, Statements and Expressions, Variables, Operators, Precedence and Associativity, Data Types, Indentation, Comments, Reading Input, Print Output, Type Conversions, the type () Function and Is Operator, Dynamic and Strongly Typed Language.

Control Flow Statements: if statement, if-else statement, if...elif...else, Nested if statement, while Loop, for Loop, continue and break Statements, Catching Exceptions Using try and except Statement.

Sample Experiments:

1. Write a program to find the largest element among three Numbers.
2. Write a Program to display all prime numbers within an interval
3. Write a program to swap two numbers without using a temporary variable.
4. Demonstrate the following Operators in Python with suitable examples.

   i) Arithmetic Operators ii) Relational Operators iii) Assignment Operators
   iv) LogicalOperators v) Bit wise Operators vi) Ternary Operator
   vii) Membership Operators viii) Identity Operators
5. Write a program to add and multiply complex numbers
6. Write a program to print multiplication table of a given number.

UNIT-II:
Functions: Built-In Functions, Commonly Used Modules, Function Definition and

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Calling the function, return Statement and void Function, Scope and Lifetime of Variables, Default Parameters, Keyword Arguments, *args and **kwargs, Command Line Arguments.

Strings: Creating and Storing Strings, Basic String Operations, Accessing Characters in String by Index Number, String Slicing and Joining, String Methods, Formatting Strings.

Lists: Creating Lists, Basic List Operations, Indexing and Slicing in Lists, Built-In Functions Used on Lists, List Methods, del Statement.

Sample Experiments:

1. Write a program to define a function with multiple return values.
2. Write a program to define a function using default arguments.
3. Write a program to find the length of the string without using any library functions.
4. Write a program to check if the substring is present in a given string or not.
5. Write a program to perform the given operations on a list:
   i) Additionii ii) Insertion iii) slicing
6. Write a program to perform any 5 built-in functions by taking any list.

UNIT-III:

Dictionaries: Creating Dictionary, Accessing and Modifying key:value Pairs in Dictionaries, Built-In Functions Used on Dictionaries, Dictionary Methods, del Statement.

Tuples and Sets: Creating Tuples, Basic Tuple Operations, tuple() Function, Indexing and Slicing in Tuples, Built-In Functions Used on Tuples, Relation between Tuples and Lists, Relation between Tuples and Dictionaries, Using zip() Function, Sets, Set Methods, Frozenset.

Sample Experiments:

1. Write a program to create tuples (name, age, address, college) for at least two members and concatenate the tuples and print the concatenated tuples.
2. Write a program to count the number of vowels in a string (No control flow allowed).
3. Write a program to check if a given key exists in a dictionary or not.
4. Write a program to add a new key-value pair to an existing dictionary.
5. Write a program to sum all the items in a given dictionary.

UNIT-IV:

Files: Types of Files, Creating and Reading Text Data, File Methods to Read and Write

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Data, Reading and Writing Binary Files, Pickle Module, Reading and Writing CSV Files, Python os and os.path Modules.

Object-Oriented Programming: Classes and Objects, Creating Classes in Python, Creating Objects in Python, Constructor Method, Classes with Multiple Objects, Class Attributes Vs Data Attributes, Encapsulation, Inheritance, Polymorphism.

Sample Experiments:

1. Write a program to sort words in a file and put them in another file. The output file should have only lower-case words, so any upper-case words from source must be lowered.
2. Python program to print each line of a file in reverse order.
3. Python program to compute the number of characters, words and lines in a file.
4. Write a program to create, display, append, insert and reverse the order of the items in the array.
5. Write a program to add, transpose and multiply two matrices.
6. Write a Python program to create a class that represents a shape. Include methods to calculate its area and perimeter. Implement subclasses for different shapes like circle, triangle, and square.

UNIT-V:

Introduction to Data Science: Functional Programming, JSON and XML in Python, NumPy with Python, Pandas.

Sample Experiments:

1. Python program to check whether a JSON string contains complex object or not.
2. Python Program to demonstrate NumPy arrays creation using array () function.
3. Python program to demonstrate use of ndim, shape, size, dtype.
4. Python program to demonstrate basic slicing, integer and Boolean indexing.
5. Python program to find min, max, sum, cumulative sum of array
6. Create a dictionary with at least five keys and each key represent value as a list where this list contains at least ten values and convert this dictionary as a pandas data frame and explore the data through the data frame as follows:
   a) Apply head () function to the pandas data frame
   b) Perform various data selection operations on Data Frame
7. Select any two columns from the above data frame, and observe the change in one attribute with respect to other attribute with scatter and plot operations in matplotlib

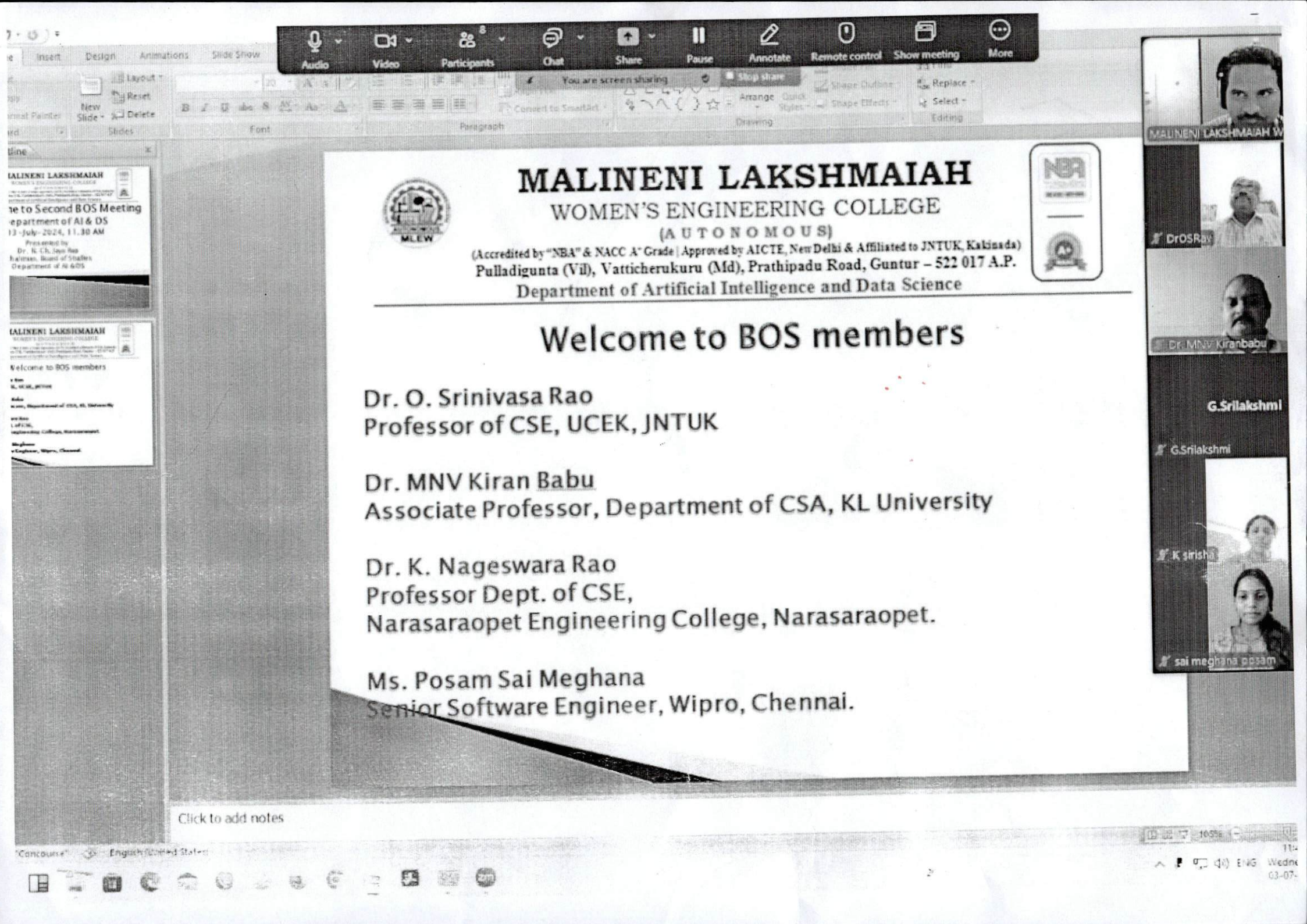
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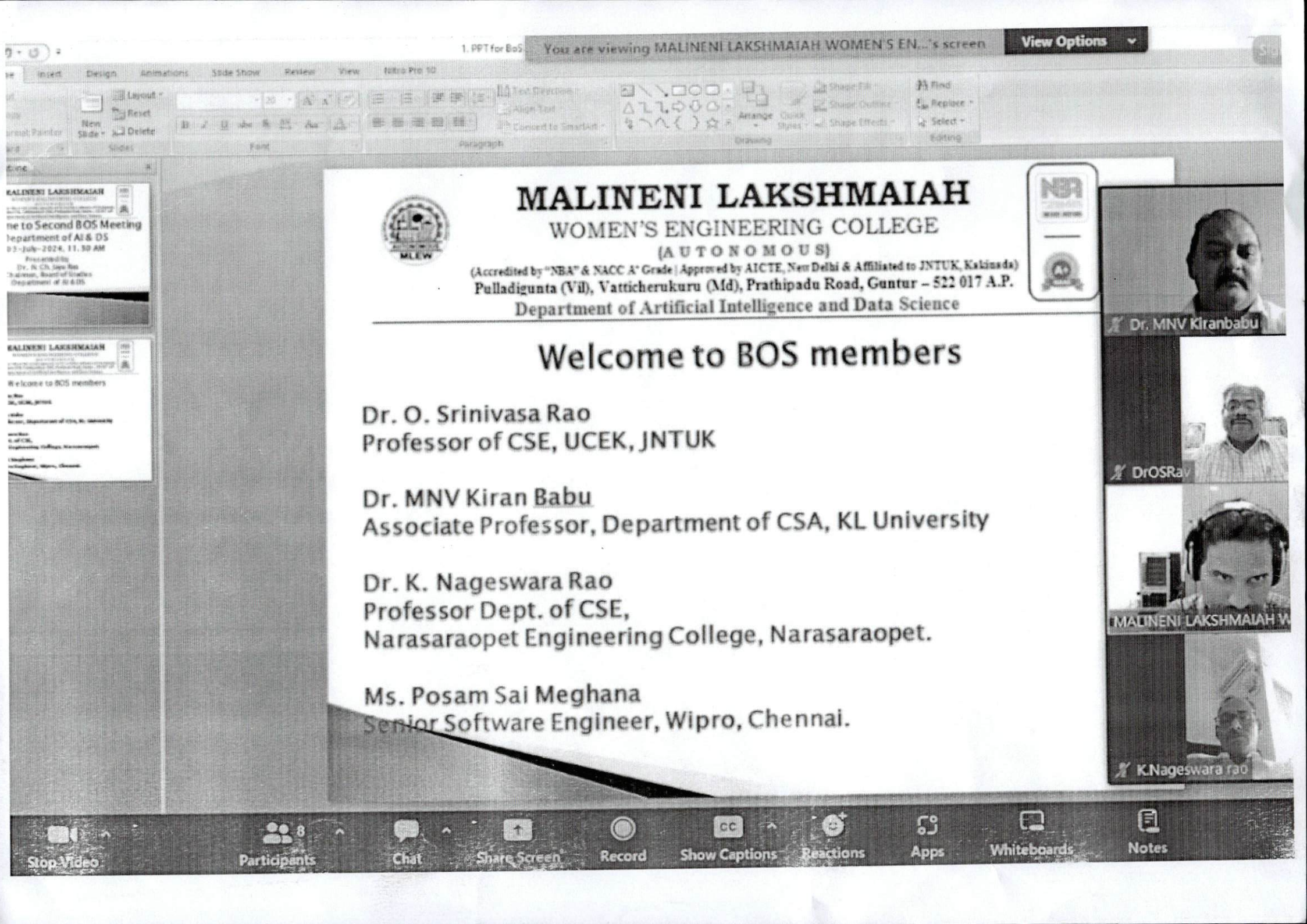
Reference Books:

1. Gowri Shankar S, Veena A., Introduction to Python Programming, CRC Press.
2. Python Programming, S Sridhar, J Indumathi, V M Hariharan, 2ndEdition, Pearson, 2024
3. Introduction to Programming Using Python, Y. Daniel Liang, Pearson.

Online Learning Resources/Virtual Labs:

1. https://www.coursera.org/learn/python-for-applied-data-science-ai
2. https://www.coursera.org/learn/python?specialization=python#syllabus


Audio
Video
Participants
Chat
Share
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WOMEN'S ENGINEERING COLLEGE
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Pulladigunta (Vil), Vatticherukuru (Md), Prathipadu Road, Guntur – 522 017 A.P.
Department of Artificial Intelligence and Data Science
Welcome to BOS members
Dr. O. Srinivasa Rao
Professor of CSE, UCEK, JNTUK
Dr. MNV Kiran Babu
Associate Professor, Department of CSA, KL University
Dr. K. Nageswara Rao
Professor Dept. of CSE,
Narasaraopet Engineering College, Narasaraopet.
Ms. Posam Sai Meghana
Senior Software Engineer, Wipro, Chennai.
MALINENI LAKSHMAIAH W
DrOSRao
Dr. MNV Kiranbabu
G.Srilakshmi
K srisha
sai meghana posam
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Dr. MNV Kiranbabu
DrOSRav
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DEPARTMENT OF ELECTRONICS ENGINEERING (VLSI DESIGN & TECHNOLOGY)

Date: 18-07-2024

Minutes of the First Board of Studies Committee Meeting-1

I. AGENDA

1. Composition of BoS.
2. Discuss the Guidelines of Autonomous Colleges
3. Discuss the curriculum structure of First Year B.Tech UG Programme.
4. Discuss the Syllabus of First Year B.Tech UG Programme.
5. Any other point by the permission of Chair

II. LIST OF MEMBERS ATTENDED

The first Board of Studies Committee for the EE (VLSI Design & Technology) Department at MLEW, Guntur, has been established with effect from July 12th, 2024, with a term of three years. The committee consists of the following members:

1. **Dr.K. Padma Priya**, Professor, ECE, JNTUK, **University Nominee**
2. **Dr. Guntha Karthik**, Associate Professor, ECE, Deputy Director, Stanley College of Engineering and Technology for Women, Abids, Hyderabad, Subject Expert **(Outside ParentUniversity)**
3. **Dr. Budati Anil Kumar**, Associate Professor, KL University of Hyderabad, Subject Expert **(Outside Parent University)**
4. **Mr. Kasuboyuna Naresh Babu,** MTS Silicon Design Engineer, AMD India Private Limited, Hyderabad, **Industry Expert**
5. **Ms. Maddiputla Pavn Priyanka,** ASIC Physical Design Engineer, MosChip, Hyderabad, **Alumni**
6. Mr. K.Ravi Kumar, Associate Professor, Faculty Member
7. Ms. K.Rajitha, Assistant Professor, Faculty Member
8. Mrs. N.N.Raja Kumari, Assistant Professor, Faculty Member
9. Mrs. M.Chandana, Assistant Professor, Faculty Member

The first meeting of the Board of Studies (BoS) Committee for the Electronics Engineering (VLSI Design & Technology) Department was held online via Zoom on July 17, 2024, at 11:00 a.m.

III. Minutes of the First BoS Meeting of Electronic Engineering (VLSI Design & Technology) Department:

1. Dr.Ch.Ramesh, BoS Chairperson, extended a cordial welcome to all the members of the BoS for ECE, for the I BoS Meeting of ECE Department (after attaining the UGC Autonomous Status in June,2023) and introduced all the members.
2. The Chairperson explained the Course Compilation, the Course Structure of the UG (B.Tech) program and the percentage (%) deviation of various course classifications with reference to AICTE recommendations.
3. The Chairperson explained the Course Structure and syllabus of the **Basic Electrical & Electronics Engineering** allotted for Electronics Engineering (VLSI Design & Technology) ECE, AIML,AIDS,DS in the First Year First Semester(I-I) and for CSE & IT in the First Year Second Semester(I-II).
4. The Chairperson explained the Lab Structure and syllabus of the **Basic Electrical & Electronics Engineering Lab** allotted for for Electronics Engineering (VLSI Design & Technology), ECE, AIML,AIDS,DS in the First Year First Semester(I-I) and for CSE & IT in the First Year Second Semester(I-II).
5. The Chairperson explained the Course and Lab Structure and syllabus of **Network Analysis** in the First Year Second Semester(I-II).
6. The BOS Committee made constructive suggestions regarding the UG (B.Tech) Course Structure & Syllabus.
7. After lengthy deliberations and progressive discussions, all the Members of the BoS for Electronic Engineering (VLSI Design & Technology) have unanimously approved:
   a) The Four Year 8 Semester UG Degree Course Structure for B.Tech. Programme in Electronics Engineering (VLSI Design & Technology) Department, with a total of 160 Credits.
   b) The Course Contents and Syllabus of the **Basic Electrical Engineering Course and Lab** for ECE, AIML, AIDS, DS in the First Year First Semester(I-I) and for CSE & IT in the First Year Second Semester(I-II).
   c) The Course Contents and Syllabus of the **Network Analysis Course and Lab** for ECE in the First Year Second Semester(I-II).



d) The BoS Committee formally authorized the BoS Chair of Electronics Engineering (VLSI Design & Technology) Department, to include any minor modifications or corrections needed for the UG Course Structures and Syllabus at later dates, if approved by the Academic Council.

IV. Signatures of Members Present:

The following are the members present for Board of Studies (BoS) meeting -1 held on 17-07-2024 through Zoom at 11.00 AM

S.No.	Name of the Member	Designation and Address	Position	Signature
1	Dr.Ch. Ramesh	Professor	Chairperson	
2	Dr. K. Padma Priya	Professor, ECE JNTUK, Kakinada	University Nominee	
3	Dr. Budati Anil Kumar	Professor, ECE KL University, Hyderabad	Subject expert (Outside the Parent University)	
4	Dr. Guntha Karthik	Assoc. Professor, ECE Deputy Director(Academics), Stanley College of Engineering and Technology for Women(Autonomous), Hyderabad	Subject expert (Outside the Parent University)	
5	Dr. Kasuboyuna NareshBabu	MTS Silicon Design Engineer, AMD India Private Ltd, Hyderabad	Industry Expert	
6	Ms. Maddipatla PavanPriyanka	ASIC Physical Design Engineer, MosChip, Hyderabad	Alumni	
7	Mr. K.Ravi Kumar	Associate Professor	Internal Faculty Member	
8	Ms.K.Rajitha	Assistant Professor	Internal Faculty Member	

9	Mrs.N.N.RajaKumari	Assistant Professor	Internal Faculty Member	
10	Mrs. M.Chandana	Assistant Professor	Internal Faculty Member	M. Chandana

Chairperson – BoS
Dept of EE(VLSID&T)

MALINENI LAKSHMAIAH WOMEN'S ENGINEERING COLLEGE
(AUTONOMOUS)
Guntur - 522 017, Andhra Pradesh.
DEPARTMENT OF ELECTRONICS ENGINEERING (VLSI Design & Tech.)

SEMESTER-WISE COURSE STRUCTURE (Group-B)

Academic Year: 2024-25 For B.Tech. Electronics Engineering (VLSI Design & Technology) Year – I , Semester – I

S.No.	Category	Course Code	Title	L/D	T	P	Credits
1.	BS	23BS11T03	Engineering Physics	3	0	0	3
2.	BS	23BS11T02	Linear Algebra & Calculus	3	0	0	3
3.	ES	23ES11T03	Basic Electrical & Electronics Engineering	3	0	0	3
4.	ES	23ES11D01	Engineering Graphics	1	0	4	3
5.	ES	23ES11T02	Introduction to Programming	3	0	0	3
6.	ES	23ES11L04	IT Workshop	0	0	2	1
7.	BS	23BS11L03	Engineering Physical Lab	0	0	2	1
8.	ES	23ES11L03	Electrical & Electronics Engineering Workshop	0	0	3	1.5
9.	ES	23ES11L02	Computer Programming Lab	0	0	3	1.5
10.	HM	23HM11L03	NSS/NCC/Scouts & Guides/Community Service	-	-	1	0.5
Total				**13**	**0**	**15**	**20.5**

Category		Credits
HM	Humanities & Management	0.5
BS	Basic Sciences	7
ES	Engineering Science	13
Total Credits		**20.5**

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(AUTONOMOUS)
Guntur - 522 017, Andhra Pradesh.
DEPARTMENT OF ELECTRONICS ENGINEERING (VLSI Design & Tech.)

SEMESTER-WISE COURSE STRUCTURE (Group-B)

Academic Year: 2024-25 For B.Tech. Electronics Engineering (VLSI Design & Technology) Year – I , Semester – II

S.No.	Category	Course Code	Title	L/D	T	P	Credits
1.	HM	23HM12T01	Communicative English	2	0	0	2
2.	BS	23BS12T01	Chemistry	3	0	0	3
3.	BS	23BS12T04	Differential Equations & Vector Calculus	3	0	0	3
4.	ES	23ES12T01	Basic Civil & Mechanical Engineering	3	0	0	3
5.	ES	23ES12T06	Network Analysis	3	0	0	3
6.	HM	23HM12L01	Communicative English Lab	0	0	2	1
7.	BS	23BS12L01	Chemistry Lab	0	0	2	1
8.	ES	23ES12L01	Engineering Workshop	0	0	3	1.5
9.	ES	23ES12L06	Network Analysis and Simulation Lab	0	0	3	1.5
10.	HM	23HM12L02	Health and Wellness, Yoga and Sports	-	-	1	0.5
			Total	**14**	**0**	**11**	**19.5**

Category		Credits
HM	Humanities & Management	3.5
BS	Basic Sciences	7
ES	Engineering Science	9.0
Total Credits		**19.5**

MALINENI LAKSHMAIAH
WOMEN'S ENGINEERING COLLEGE
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Pulladigunta (Vil), Vatticherukuru (Md), Prathipadu Road, Guntur – 522 017 A.P.



Hearty Welcome



to

The Members of Board of Studies (BoS)

Department of Electronics Engineering (VLSI Design & Technology)

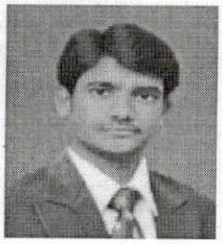
17th July 2024

BoS Meeting - 1

MEMBERS OF BOARD OF STUDIES (BoS) – Dept. of EE(VLSID&T)



Dr. K. Padma Priya
Professor, ECE,
Director, Green Initiatives,
JNTUK, Kakinada
University Nominee



Dr. G. Karthik
Associate Professor, ECE
Stanley College of Engineering & Technology for Women, Hyderabad
Subject Expert
(Outside Parent University)



Dr. B. Anil Kumar
Associate Professor, ECE
KL University, Hyderabad
Subject Expert
(Outside Parent University)

MEMBERS OF BOARD OF STUDIES (BoS) – Dept. of EE(VLSID&T)

Dr. K Naresh Babu
MTS Silicon
Design Engineer
AMD India Pvt Ltd
Industry Expert



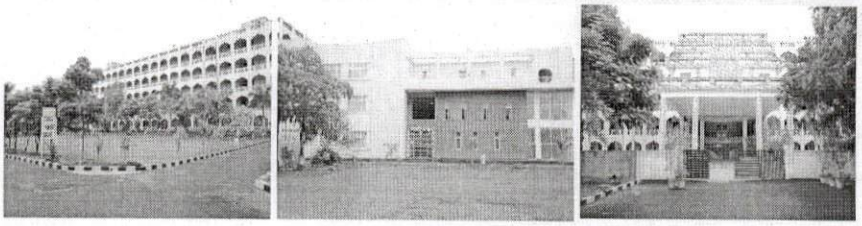
Ms. M. Pavan Priyanka
ASIC Physical Design Engineer
MosChip, Hyderabad
Alumni

Internal Department Subject Experts

S.No	Name of the member	Designation	Position
1	Mr. K.Ravi Kumar	Associate Professor	Faculty Member
2	Ms. K.Rajitha	Assistant Professor	Faculty Member
3	Mrs. N.N. Raja Kumari	Assistant Professor	Faculty member
4	Mrs. M. Chandana	Assistant Professor	Faculty Member

ABOUT THE COLLEGE

- Established in 2008 and sponsored by Malineni Perumallu Educational Society.
- Malineni Lakshmaiah Women's Engineering College visions to foster academic excellence in the field of technical education especially empowering girl students from rural areas.
- Self - Financing Institution.
- Approved by All India Council for Technical Education (AICTE), New Delhi.
- Affiliated to Jawaharlal Nehru Technological University(JNTU) Kakinada, Kakinada.
- Certified by ISO: 9001 – 2015



Recognitions

- Two UG Programmes (B. Tech.) viz. **ECE, CSE** were **accredited by NBA** in the year 2022 for a period of 3 years.
- Malineni Lakshmaiah Women's Engineering College, Guntur **accredited by National Assessment and Accreditation Council (NAAC) with CGPA of 3.43 on four-point scale at A+ grade** valid up to January 02, 2028.
- Malineni Lakshmaiah Women's Engineering College, Guntur has been included in the list of colleges prepared under **section 2(f) of the UGC Act, 1956**.
- University Grants Commission (UGC), New Delhi has **granted the conferment of Fresh Autonomous Status** to "Malineni Lakshmaiah Women's Engineering College, Guntur" for a period of Ten years from the Academic Year 2023-24 to 2032-33.

Administration

The College is sponsored by
Malineni Perumallu Educational Society.

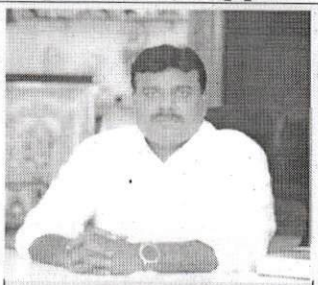
Founder Chairman : **Dr. Malineni Lakshmaiah**

Chairman : **Dr. Malineni Perumallu**

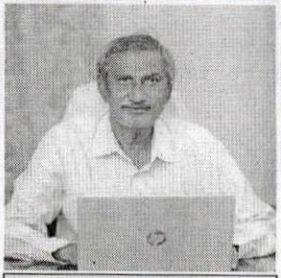
Principal : Dr. J. Appa Rao



Dr. Malineni Lakshmaiah
Founder Chairman



Dr. Malineni Perumallu
Chairman



Dr. J. Appa Rao
Principal

INSTITUTE VISION AND MISSION

VISION

- To be a pioneer institute in engineering education, fostering academic excellence and producing empowered women engineers, blended with ethics and values to serve the society.

MISSION

- To achieve academic excellence through innovative teaching-learning practices.
- To inculcate self-discipline, ethics, and values amongst the learners
- To bridge the gap between industry and academia through the industry-institute interface
- To promote higher education, research and inculcate entrepreneurial attitude amongst the learners

DEPARTMENT VISION AND MISSION

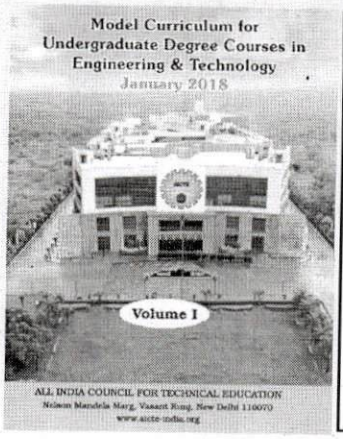
VISION

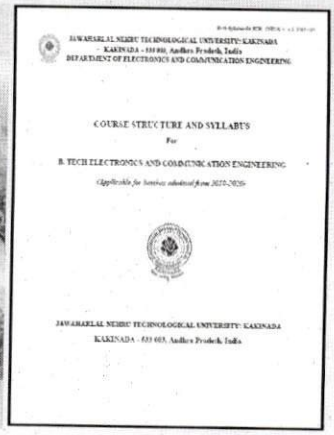
- To be a leading Centre of Excellence in Electronics Engineering, delivering superior education and cultivating skilled women engineers to tackle the global challenges of society.

MISSION

- To foster professional excellence and promote a research-oriented culture through active interaction between industry and academia.
- To instill a strong desire for lifelong learning through the application of practical teaching and learning methods.
- To enhance professional and soft skills through both co-curricular and extra-curricular activities.
- To cultivate ethical and socio-economic values among learners through a supportive learning environment..

Proposed B.Tech Course Structure for U.G. – EE(VLSI &D), MLEW REGULATION - R23





R23- COURSE STRUCTURE CATEGORY

All the courses offered for the B.Tech program are broadly classified as follows:

S. No	Category	Break up of Credits	Percentage of total credits	AICTE Recommendation
1	Basic Science & Humanities and social science including Management Courses	23	21%	20-25 %
2	Engineering Science Courses	23.5	14 %	10-18 %
3	Professional Core Courses	54.5	34 %	30-36 %
4	Open Elective Courses, Professional Elective Courses	33	21 %	19-23 %
5	Internship, Seminar, Project Work	16	10 %	8-11 %
6	Mandatory Courses	Non - credit		
	Total Credits	**160**		

R23- COURSE STRUCTURE CATEGORY

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5	Internship, Seminar, Project Work	16	10 %	8-11 %
6	Mandatory Courses	Non - credit		
	Total Credits	**160**		

R23- B.Tech. Electronics Engineering (VLSI Design& Technology) COURSE STRUCTURE CREDITS CATEGORY

S.No.	Category	Code	I	II	III	IV	V	VI	VII	VIII	Total
1	Basic Science courses & Humanities and social science including Management courses	HS	12	12.5	6						30.5
2	Engineering Science courses	ES	7.5	7	1.5	7.5					23.5
3	Professional Core Courses	PC			12	12	12	13.5	3		52.5
4	Open Elective Courses	OE					3	3	6		12
5	Professional Elective Courses	PE					3	3	9		15
6	Internship						1.5		3		4.5
7	Mandatory courses	MC									
8	Skill Oriented Courses	SC			2	2	2	2	2		10
9	Project	PROJ								12	12
Total Credits			**19.5**	**19.5**	**21.5**	**21.5**	**21.5**	**21.5**	**23**	**12**	**160**

SEMESTER - 1

S.No.	Category	Course Title	L	T	P	C
		THEORY				
1	BS&H	Engineering Physics	3	0	0	3
2	BS&H	Linear Algebra & Calculus	3	0	0	3
3	**Engineering Science**	**Basic Electrical & Electronics Engineering**	3	0	0	3
4	Engineering Science	Engineering Graphics	1	0	4	3
5	Engineering Science	Introduction to Programming	3	0	0	3
6	Engineering Science	IT Workshop	0	0	2	1
		PRACTICAL				
7	BS&H	Engineering Physics Lab	0	0	2	1
8	**Engineering Science**	**Electrical & Electronics Engineering Workshop**	0	0	3	1.5
9	Engineering Science	Computer Programming Lab	0	0	3	1.5
10	BS&H	NSS/NCC/Scouts & Guides/Community Service	-	-	1	0.5
		Total Credits				**20.5**

SEMESTER - 2

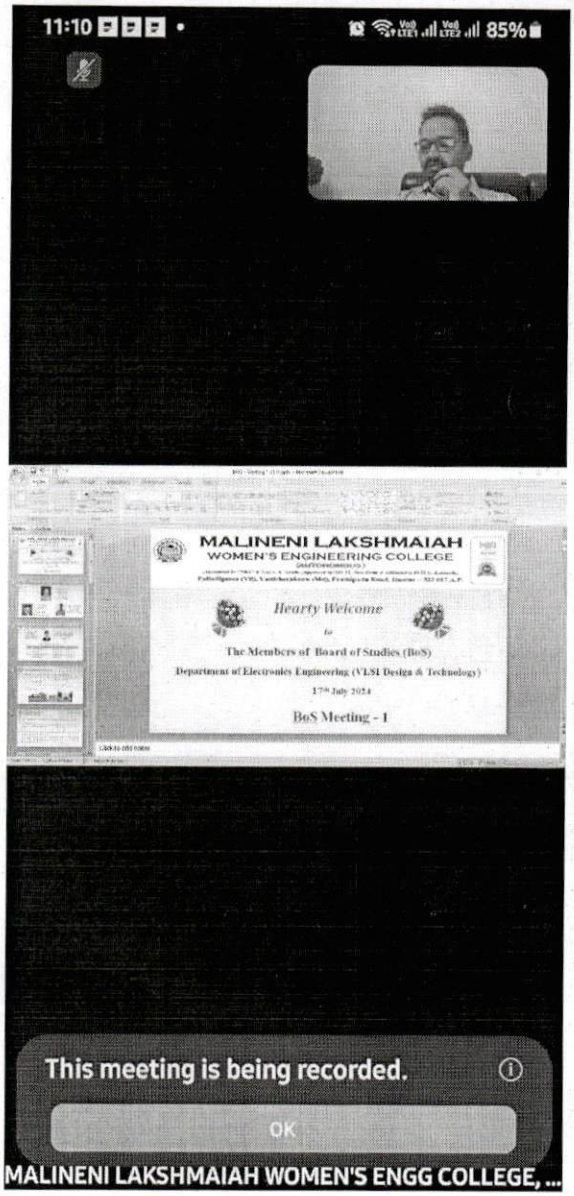
S.No.	Category	Course Title	L	T	P	C
		THEORY				
1	BS&H	Communicative English	3	0	0	2
2	BS&H	Engineering Chemistry / Chemistry / Fundamental Chemistry	3	0	0	3
3	Engineering Science	Differential Equations & Vector Calculus	1	0	4	3
4	Engineering Science	Basic Civil & Mechanical Engineering	3	0	0	3
5	**Professional Core**	**Network Analysis**	3	0	0	3
		PRACTICAL				
6	BS&H	Communicative English Lab	0	0	3	1
7	BS&H	Engineering Chemistry / Chemistry / Fundamental Chemistry Lab	0	0	3	1
8	Engineering Science	Engineering Workshop	0	0	3	1.5
9	**Professional Core**	**Network Analysis and Simulation Lab**	0	0	3	1.5
10		Health and wellness, Yoga and Sports	-	-	1	0.5
		Total Credits				**19.5**

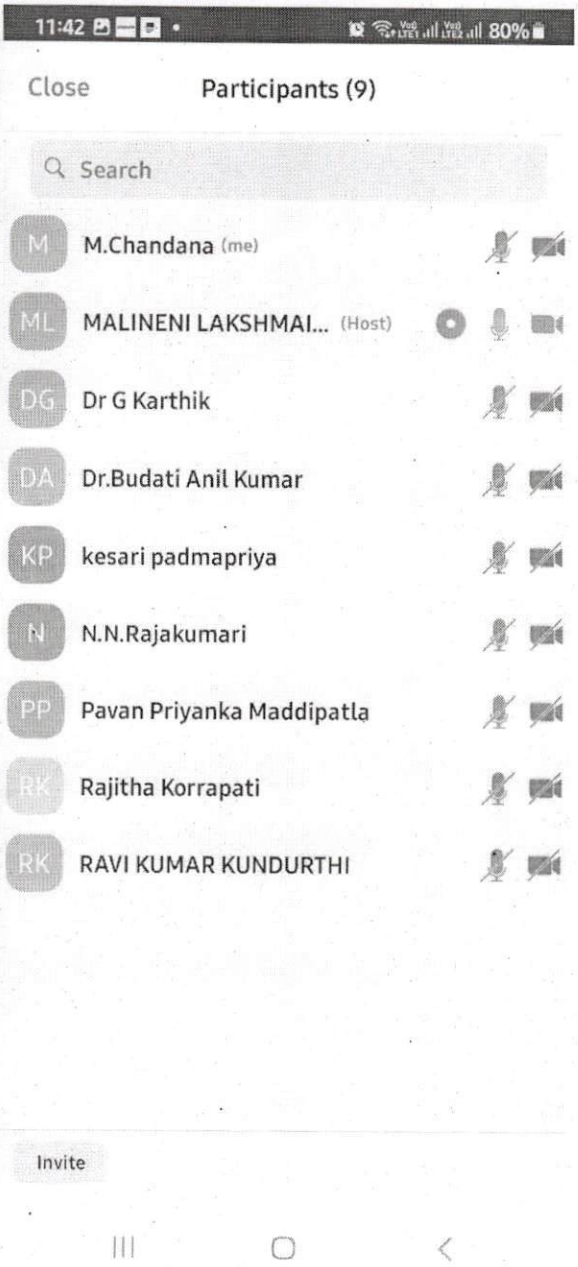
Credits covered till first year in various category

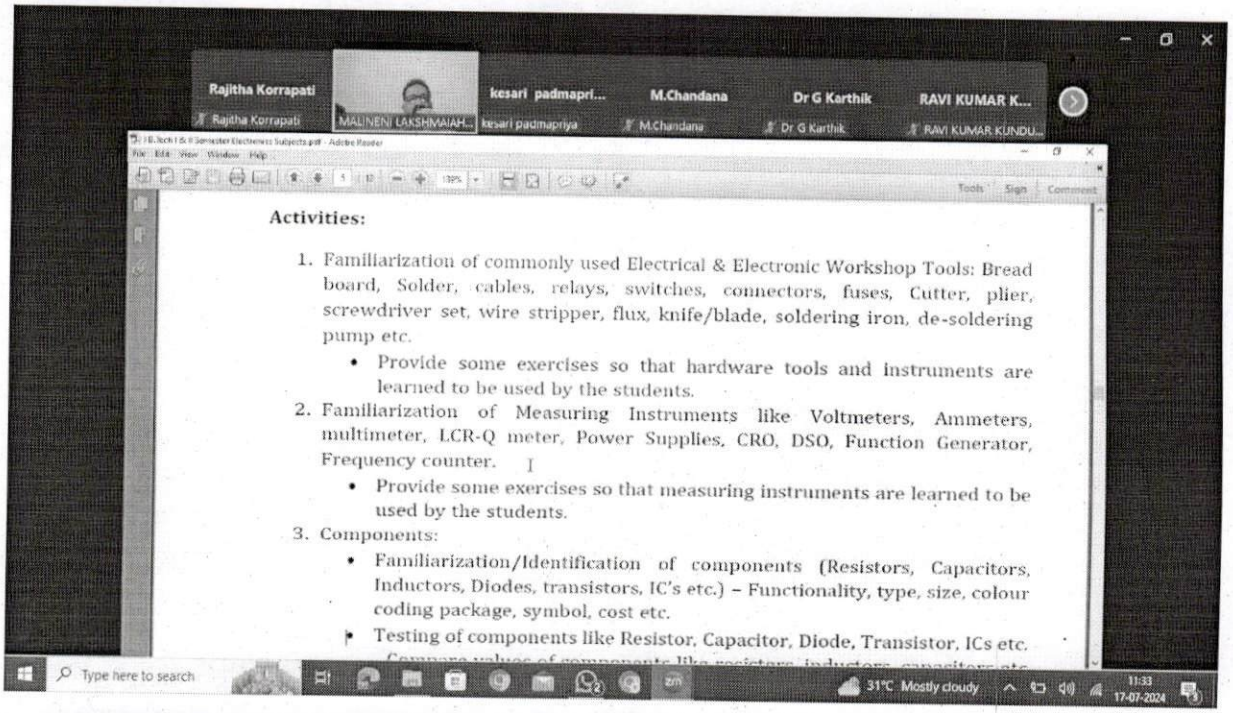
S.No	Category	1-1	1-2	Total Credits
1	Humanities and social science including Management courses	0.5	3.5	4
2	Basic Science Courses	7	7	14
3	Engineering science courses	13	9	22
	Total Credits in I year	**20.5**	**19.5**	**40**

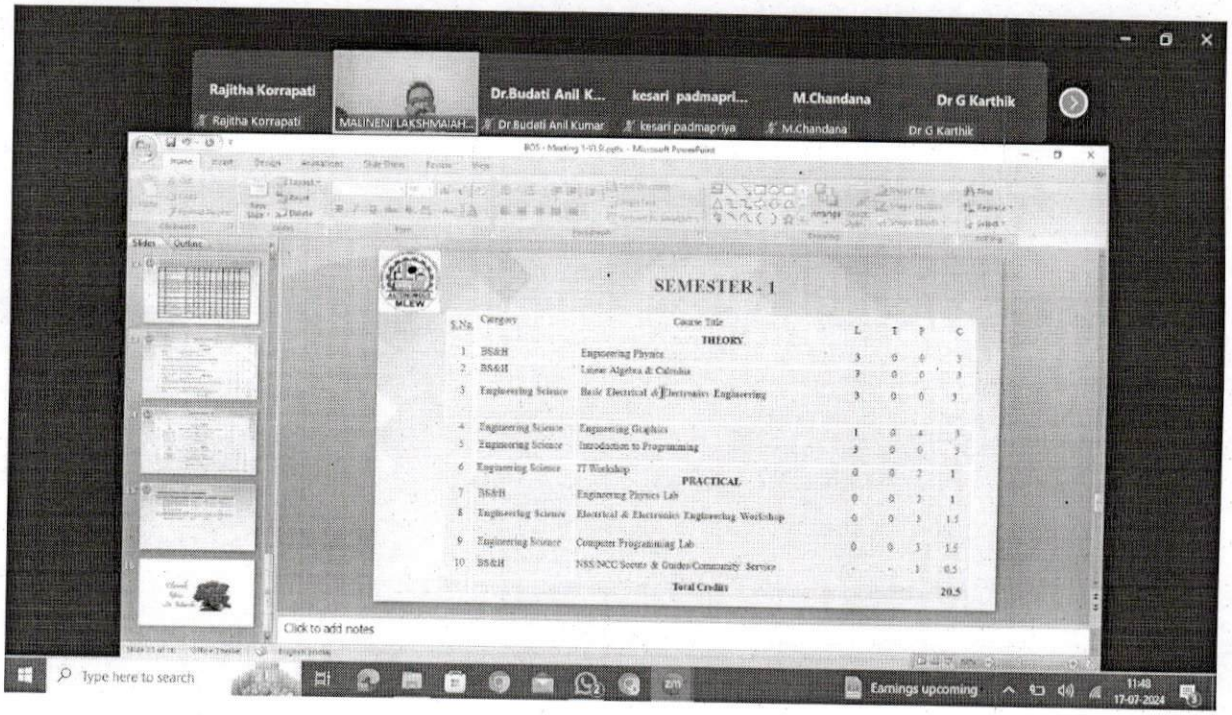
Thank You So Much

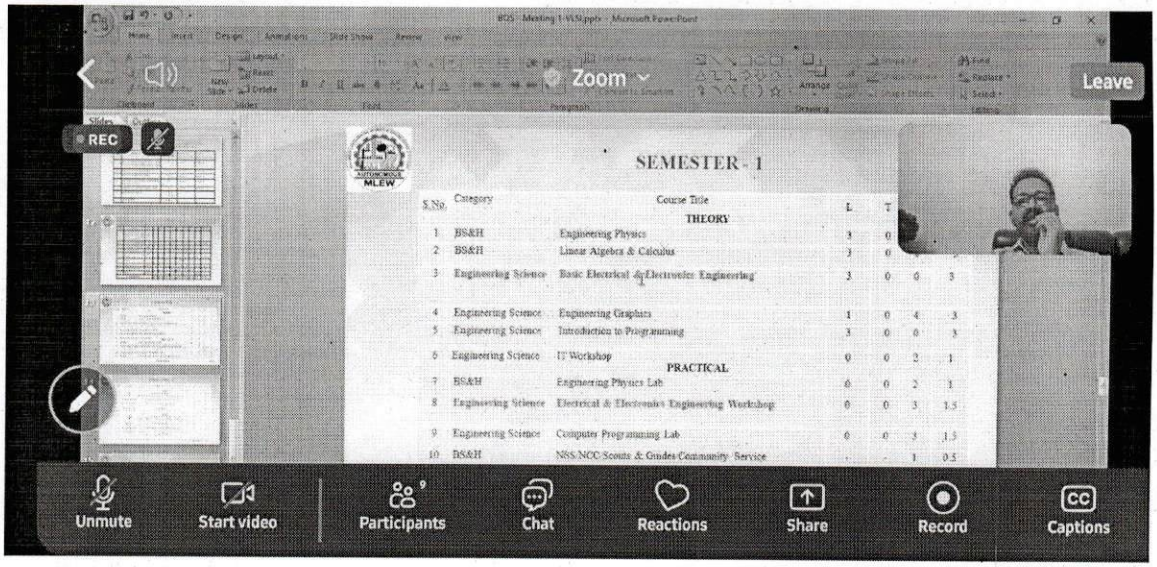



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MALINENI LAKSHMAIAH
WOMEN'S ENGINEERING COLLEGE
Hearty Welcome
to
The Members of Board of Studies (BoS)
Department of Electronics Engineering (VLSI Design & Technology)
BoS Meeting - I
This meeting is being recorded.
OK
MALINENI LAKSHMAIAH WOMEN'S ENGG COLLEGE, ...

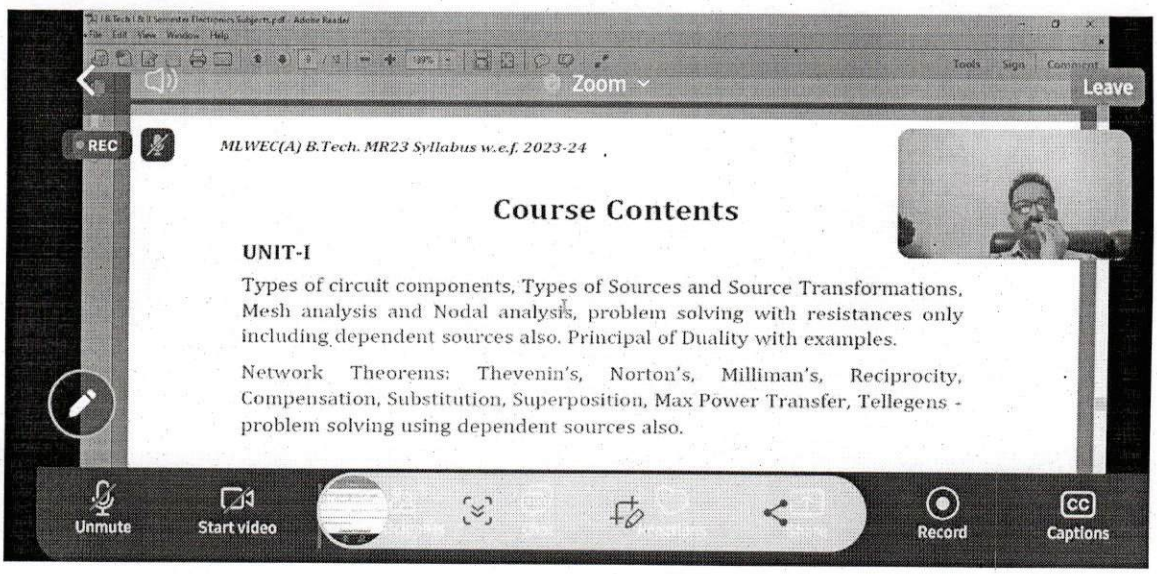

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Participants (9)
Search
M.Chandana (me)
MALINENI LAKSHMAI... (Host)
Dr G Karthik
Dr.Budati Anil Kumar
kesari padmapriya
N.N.Rajakumari
Pavan Priyanka Maddipatla
Rajitha Korrapati
RAVI KUMAR KUNDURTHI
Invite


Rajitha Korrapati
MALINENI LAKSHMAIAH...
kesari padmapri...
M.Chandana
Dr G Karthik
RAVI KUMAR K...
Activities:
1. Familiarization of commonly used Electrical & Electronic Workshop Tools: Bread board, Solder, cables, relays, switches, connectors, fuses, Cutter, plier, screwdriver set, wire stripper, flux, knife/blade, soldering iron, de-soldering pump etc.
• Provide some exercises so that hardware tools and instruments are learned to be used by the students.
2. Familiarization of Measuring Instruments like Voltmeters, Ammeters, multimeter, LCR-Q meter, Power Supplies, CRO, DSO, Function Generator, Frequency counter.
• Provide some exercises so that measuring instruments are learned to be used by the students.
3. Components:
• Familiarization/Identification of components (Resistors, Capacitors, Inductors, Diodes, transistors, IC's etc.) – Functionality, type, size, colour coding package, symbol, cost etc.
• Testing of components like Resistor, Capacitor, Diode, Transistor, ICs etc.
Type here to search
31°C Mostly cloudy
11:33
17-07-2024


Rajitha Korrapati
MALINENI LAKSHMAIAH...
Dr.Budati Anil K...
kesari padmapri...
M.Chandana
Dr G Karthik
SEMESTER - 1
S.No. Category Course Title L T P C
THEORY
1 BS&H Engineering Physics 3 0 0 3
2 BS&H Linear Algebra & Calculus 3 0 0 3
3 Engineering Science Basic Electrical & Electronics Engineering 3 0 0 3
4 Engineering Science Engineering Graphics 1 0 4 3
5 Engineering Science Introduction to Programming 3 0 0 3
6 Engineering Science IT Workshop 0 0 2 1
PRACTICAL
7 BS&H Engineering Physics Lab 0 0 2 1
8 Engineering Science Electrical & Electronics Engineering Workshop 0 0 3 1.5
9 Engineering Science Computer Programming Lab 0 0 3 1.5
10 BS&H NSS/NCC Scouts & Guides/Community Service - - 1 0.5
Total Credits 20.5
Click to add notes
Type here to search
Earnings upcoming
11:48
17-07-2024



S.No.	Category	Course Title	L	T	P	C
		THEORY				
1	BS&H	Engineering Physics	3	0		
2	BS&H	Linear Algebra & Calculus	3	0		
3	Engineering Science	Basic Electrical & Electronics Engineering	3	0	0	3
4	Engineering Science	Engineering Graphics	1	0	4	3
5	Engineering Science	Introduction to Programming	3	0	0	3
6	Engineering Science	IT Workshop	0	0	2	1
		PRACTICAL				
7	BS&H	Engineering Physics Lab	0	0	2	1
8	Engineering Science	Electrical & Electronics Engineering Workshop	0	0	3	1.5
9	Engineering Science	Computer Programming Lab	0	0	3	1.5
10	BS&H	NSS/NCC/Scouts & Guides/Community Service	-	-	1	0.5



23ES11T03 – BASIC ELECTRICAL AND ELECTRONICS ENGINEERING

Course category	**Engineering Sciences (ES)**	Credits	**3**
Course Type	**Theory**	L-T-P	**3-0-0**
Year	**I**	CIE Marks	**30**
Sem.	**I**	SEE Marks	**70**
		Total Marks	**100**

Course Objectives:

- To expose to the field of electrical & electronics engineering, laws and principles of electrical/electronic engineering and to acquire fundamental knowledge in the relevant field.

Course Outcomes:

Course Outcomes (COs)		**Bloom's Taxonomy Knowledge Level (KL)**
At the end of course, the student will be able to		
CO1	Describe fundamental laws, operating principles of motors/generators, MC/MI instruments	**L2**
CO2	Demonstrate the working of electrical machines, measuring instruments and power generation stations.	**L2**
CO3	Apply mathematical tools and fundamental concepts to derive various equations related to electrical circuits and machines.	**L3**
CO4	Understand the operation of PN junction diode and its application as a rectifier	**L2**
CO5	Understand the operation of transistor along with its characteristics and to analyse its application as amplifier	**L4**
CO6	Study the functionality of logic gates and apply it for the design of combinational and sequential circuits	**L3**

Note: *L1- Remember, L2-Understand, L3-Apply, L4-Analyze, L5-Evaluate, L6-Create*

COURSE CONTENTS

PART A: BASIC ELECTRICAL ENGINEERING

UNIT I DC & AC Circuits

DC Circuits: Electrical circuit elements (R, L and C), Ohm's Law and its limitations, KCL & KVL, series, parallel, series-parallel circuits, Super Position theorem, Simple numerical problems.

AC Circuits: A.C. Fundamentals: Equation of AC Voltage and current, waveform, time period, frequency, amplitude, phase, phase difference, average value, RMS value, form factor, peak factor, Voltage and current relationship with phasor diagrams in R, L, and C circuits, Concept of Impedance, Active power, reactive power and apparent power, Concept of power factor (Simple Numerical problems).

UNIT II Machines and Measuring Instruments

Machines: Construction, principle and operation of (i) DC Motor, (ii) DC Generator, (iii) Single Phase Transformer, (iv) Three Phase Induction Motor and (v) Alternator, Applications of electrical machines.

Measuring Instruments: Construction and working principle of Permanent Magnet Moving Coil (PMMC), Moving Iron (MI) Instruments and Wheat Stone bridge.

UNIT III Energy Resources, Electricity Bill & Safety Measures

Energy Resources: Conventional and non-conventional energy resources; Layout and operation of various Power Generation systems: Hydel, Nuclear, Solar & Wind power generation.

Electricity Bill: Power rating of household appliances including air conditioners, PCs, Laptops, Printers, etc. Definition of "unit" used for consumption of electrical energy, two-part electricity tariff, calculation of electricity bill for domestic consumers.

Equipment Safety Measures: Working principle of Fuse and Miniature circuit breaker (MCB), merits and demerits. Personal safety measures: Electric Shock, Earthing and its types, Safety Precautions to avoid shock.

Textbooks:

1. Basic Electrical Engineering, D. C. Kulshreshtha, Tata McGraw Hill, 2019, First Edition
2. Power System Engineering, P.V. Gupta, M.L. Soni, U.S. Bhatnagar and A. Chakrabarti, Dhanpat Rai & Co, 2013

3. Fundamentals of Electrical Engineering, Rajendra Prasad, PHI publishers, 2014, Third Edition

Reference Books:

1. Basic Electrical Engineering, D. P. Kothari and I. J. Nagrath, McGraw Hill, 2019, Fourth Edition
2. Principles of Power Systems, V.K. Mehtha, S.Chand Technical Publishers, 2020
3. Basic Electrical Engineering, T. K. Nagsarkar and M. S. Sukhija, Oxford University Press, 2017
4. Basic Electrical and Electronics Engineering, S. K. Bhatacharya, Person Publications, 2018, Second Edition.

PART B: BASIC ELECTRONICS ENGINEERING

Course Objectives:

- To teach the fundamentals of semiconductor devices and its applications, principles of digital electronics.

UNIT I SEMICONDUCTOR DEVICES

Introduction - Evolution of electronics – Vacuum tubes to nano electronics - Characteristics of PN Junction Diode — Zener Effect — Zener Diode and its Characteristics. Bipolar Junction Transistor — CB, CE, CC Configurations and Characteristics — Elementary Treatment of Small Signal CE Amplifier.

UNIT II BASIC ELECTRONIC CIRCUITS AND INSTRUMENTTAION

Rectifiers and power supplies: Block diagram description of a dc power supply, working of a full wave bridge rectifier, capacitor filter (no analysis), working of simple zener voltage regulator. Amplifiers: Block diagram of Public Address system, Circuit diagram and working of common emitter (RC coupled) amplifier with its frequency response. Electronic Instrumentation: Block diagram of an electronic instrumentation system.

UNIT III DIGITAL ELECTRONICS

Overview of Number Systems, Logic gates including Universal Gates, BCD codes, Excess-3 code, Gray code, Hamming code. Boolean Algebra, Basic Theorems and properties of Boolean Algebra, Truth Tables and Functionality of Logic Gates – NOT, OR, AND, NOR, NAND, XOR and XNOR. Simple combinational circuits–Half and Full Adders. Introduction to sequential circuits, Flip flops, Registers and counters (Elementary Treatment only).

Text Books:

1. R. L. Boylestad & Louis Nashlesky, Electronic Devices & Circuit Theory, Pearson Education, 2021.
2. R. P. Jain, Modern Digital Electronics, 4th Edition, Tata McGraw Hill, 2009

Reference Books:

1. R. S. Sedha, A Textbook of Electronic Devices and Circuits, S. Chand & Co, 2010.
2. Santiram Kal, Basic Electronics- Devices, Circuits and IT Fundamentals, Prentice Hall, India, 2002.
3. R. T. Paynter, Introductory Electronic Devices & Circuits – Conventional Flow Version, Pearson Education,2009.

Web Resources:

1. https://nptel.ac.in/courses/108105053
2. https://nptel.ac.in/courses/108108076

End examination pattern:

i) Question paper shall be in two parts viz., Part A and Part B with equal weightage of 35 marks each.

ii) In each part, question 1 shall contain 5 compulsory short answer questions for a total of 5 marks such that each question carries 1 mark.

iii) In each part, questions from 2 to 4, there shall be either/or type questions of 10 marks each. Student shall answer any one of them.

iv) The questions from 2 to 4 shall be set by covering one unit of the syllabus for each question.



23ES11L03 – ELECTRICAL AND ELECTRONICS ENGINEERING WORKSHOP

Course category	**Engineering Science (ES)**	Credits	**1.5**
Course Type	**Practicals**	L-T-P	**0-0-3**
Year	**I**	CIE Marks	**30**
Sem.	**I**	SEE Marks	**70**
		Total Marks	**100**

Course Objectives:

- To impart knowledge on the fundamental laws & theorems of electrical circuits, functions of electrical machines and energy calculations.
- To impart knowledge on the principles of digital electronics and fundamentals of electron devices & its applications.

Course Outcomes:

Course Outcomes (COs)		**Bloom's Taxonomy Knowledge Level (KL)**
At the end of course, the student will be able to		
CO1	Measure voltage, current and power in an electrical circuit	**L2**
CO2	Measure of Resistance using Wheat stone bridge (L4).	**L2**
CO3	Discover critical field resistance and critical speed of DC shunt generators.	**L4**
CO4	Investigate the effect of reactive power and power factor in electrical loads	**L3**
CO5	Identify & testing of various electronic components.	**L4**
CO6	Understand the usage of electronic measuring instruments.	**L4**
CO7	Plot and discuss the characteristics of various electron devices.	**L5**

Note: *L1- Remember, L2-Understand, L3-Apply, L4-Analyze, L5-Evaluate, L6-Create*

COURSE CONTENTS

Activities:

1. Components:
    - Familiarization/Identification of components (Resistors, Capacitors, Inductors, Diodes, transistors, IC's etc.) – Functionality, type, size, colour coding package, symbol, cost etc.
    - Testing of components like Resistor, Capacitor, Diode, Transistor, ICs etc. - Compare values of components like resistors, inductors, capacitors etc with the measured values by using instruments.
2. Familiarization of commonly used Electrical & Electronic Workshop Tools: Bread board, Solder, cables, relays, switches, connectors, fuses, Cutter, plier, screwdriver set, wire stripper, flux, knife/blade, soldering iron, de-soldering pump etc.
    - Provide some exercises so that hardware tools and instruments are learned to be used by the students.
3. Familiarization of Measuring Instruments like Voltmeters, Ammeters, multimeter, LCR-Q meter, Power Supplies, CRO, DSO, Function Generator, Frequency counter.
    - Provide some exercises so that measuring instruments are learned to be used by the students.

PART A: ELECTRICAL ENGINEERING LAB

List of experiments:

1. Verification of KCL and KVL
2. Verification of Superposition theorem
3. Measurement of Resistance using Wheat stone bridge
4. Magnetization Characteristics of DC shunt Generator
5. Measurement of Power and Power factor using Single-phase wattmeter
6. Measurement of Earth Resistance using Megger.
7. Calculation of Electrical Energy for Domestic Premises

Reference Books:

1. Basic Electrical Engineering, D. C. Kulshreshtha, Tata McGraw Hill, 2019, First Edition
2. Power System Engineering, P.V. Gupta, M.L. Soni, U.S. Bhatnagar and A. Chakrabarti, Dhanpat Rai & Co, 2013
3. Fundamentals of Electrical Engineering, Rajendra Prasad, PHI publishers, 2014, Third Edition

Note: Minimum Six Experiments to be performed.

PART B: ELECTRONICS ENGINEERING LAB

List of Experiments:

1. Plot V-I characteristics of PN Junction diode A) Forward bias B) Reverse bias.
2. Plot V – I characteristics of Zener Diode and its application as voltage Regulator.
3. Implementation of half wave and full wave rectifiers
4. Plot Input & Output characteristics of BJT in CE and CB configurations
5. Frequency response of CE amplifier.
6. Simulation of RC coupled amplifier with the design supplied
7. Verification of Truth Table of AND, OR, NOT, NAND, NOR, Ex-OR, Ex-NOR gates using ICs.
8. Verification of Truth Tables of S-R, J-K& D flip flops using respective ICs. Tools / Equipment Required: DC Power supplies, Multi meters, DC Ammeters, DC Voltmeters, AC Voltmeters, CROs, all the required active devices.

References:

1. R. L. Boylestad & Louis Nashlesky, Electronic Devices & Circuit Theory, Pearson Education, 2021.
2. R. P. Jain, Modern Digital Electronics, 4th Edition, Tata Mc Graw Hill, 2009
3. R. T. Paynter, Introductory Electronic Devices & Circuits – Conventional Flow Version, Pearson Education, 2009.

Note: Minimum Six Experiments to be performed. All the experiments shall be implemented using both Hardware and Software.



23ES12T06 - NETWORK ANALYSIS

Course category	**Engineering Sciences (ES)**	Credits	**3**
Course Type	**Theory**	L-T-P	**3-0-0**
Year	**I**	CIE Marks	**30**
Sem.	**II**	SEE Marks	**70**
		Total Marks	**100**

Course Objectives:

- To introduce basic laws, mesh & nodal analysis techniques for solving electrical circuits
- To impart knowledge on applying appropriate theorem for electrical circuit analysis
- To explain transient behavior of circuits in time and frequency domains
- To teach concepts of resonance
- To introduce open circuit, short circuit, transmission, hybrid parameters and their interrelationship.

Course Outcomes:

Course Outcomes (COs)		**Bloom's Taxonomy Knowledge Level (KL)**
At the end of this course students will demonstrate the ability to		
CO1	Understand basic electrical circuits with nodal and mesh analysis.	**L2**
CO2	Analyse the circuit using network simplification theorems.	**L4**
CO3	Find Transient response and Steady state response of a network.	**L3**
CO4	Analyse electrical networks in the Laplace domain.	**L4**
CO5	Compute the parameters of a two-port network.	**L3**

Note: *L1-Remember, L2-Understand, L3-Apply, L4-Analyze, L5-Evaluate, L6-Create*

COURSE CONTENTS

UNIT-I

Types of circuit components, Types of Sources and Source Transformations, Mesh analysis and Nodal analysis, problem solving with resistances only including dependent sources also. Principal of Duality with examples.

Network Theorems: Thevenin's, Norton's, Milliman's, Reciprocity, Compensation, Substitution, Superposition, Max Power Transfer, Tellegens - problem solving using dependent sources also.

UNIT-II

Transients: First order differential equations, Definition of time constants, R-L circuit, R-C circuit with DC excitation, evaluating initial conditions procedure, second order differential equations, homogeneous, non-homogenous, problem-solving using R-L-C elements with DC excitation and AC excitation, Response as related to s-plane rotation of roots.

Laplace transform: introduction, Laplace transformation, basic theorems, problem solving using Laplace transform, partial fraction expansion, Heaviside's expansions, problem solving using Laplace transform.

UNIT-III

Steady State Analysis of A.C Circuits: Impedance concept, phase angle, series R-L, R-C, R-LC circuits problem solving. Complex impedance and phasor notation for R-L, R-C, R-L-C problem solving using mesh and nodal analysis, Star-Delta conversion, problem solving using Laplace transforms also.

UNIT-IV

Resonance: Introduction, Definition of Q, Series resonance, Bandwidth of series resonance, Parallel resonance, general case-resistance present in both branches, anti-resonance at all frequencies.

Coupled Circuits: Coupled Circuits: Self-inductance, Mutual inductance, Coefficient of coupling, analysis of coupled circuits, Natural current, Dot rule of coupled circuits, conductively coupled equivalent circuits- problem solving.

UNIT-V

Two-port Networks: Relationship of two port networks, Z-parameters, Y-parameters, Transmission line parameters, h- parameters, Relationships Between parameter Sets, Parallel & series connection of two port networks, cascading of two port networks, problem solving using dependent sources also.

Image and iterative impedances. Image and iterative transfer constants. Insertion loss. Attenuators and pads. Lattice network and its parameters. Impedance matching networks.

Textbooks:

1. Network Analysis – ME Van Valkenburg, Prentice Hall of India, revised 3rd Edition, 2019.
2. Engineering Circuit Analysis by William H. Hayt, Jack Kemmerly, Jamie Phillips, Steven M. Durbin, 9th Edition 2020.
3. Network lines and Fields by John. D. Ryder 2nd Edition, PHI

Reference Books:

1. D. Roy Choudhury, Networks and Systems, New Age International Publications, 2013.
2. Joseph Edminister and Mahmood Nahvi, Electric Circuits, Schaum's Outline Series, 7 th Edition, Tata McGraw Hill Publishing Company, New Delhi, 2017
3. Fundamentals of Electric Circuits by Charles K. Alexander and Matthew N. O. Sadiku, McGraw-Hill Education



23ES12L06 –

NETWORK ANALYSIS AND SIMULATION LAB

Course category	**Engineering Sciences (ES)**	Credits	**1.5**
Course Type	**Practicals**	L-T-P	**0-0-3**
Year	**I**	CIE Marks	**30**
Sem.	**II**	SEE Marks	**70**
		Total Marks	**100**

Course Objectives:

- To gain hands on experience in verifying Kirchoff's laws and network theorems
- To analyze transient behavior of circuits
- To study resonance characteristics
- To determine 2-port network parameters

Course Outcomes:

Course Outcomes (COs)		**Bloom's Taxonomy Knowledge Level (KL)**
At the end of this course students will demonstrate the ability to		
CO1	Verify Kirchoff's laws and network theorems.	**L3**
CO2	Measure time constants of RL & RC circuits.	**L3**
CO3	Analyze behavior of RLC circuit for different cases.	**L4**
CO4	Design resonant circuit for given specifications.	**L3**
CO5	Characterize and model the network in terms of all network parameters.	**L3**

Note: *L1-Remember, L2-Understand, L3-Apply, L4-Analyze, L5-Evaluate, L6-Create*



COURSE CONTENTS

The following experiments need to be performed using both Hardware and simulation Software.

The experiments need to be simulated using software and the same need to be verified using the hardware.

1. Study of components of a circuit and Verification of KCL and KVL.
2. Verification of mesh and nodal analysis for AC circuits
3. Verification of Superposition, Thevenin's & Norton theorems for AC circuits
4. Verification of maximum power transfer theorem for AC circuits
5. Verification of Tellegen's theorem for two networks of the same topology.
6. Study of DC transients in RL, RC and RLC circuits
7. To study frequency response of various 1st order RL & RC networks
8. To study the transient and steady state response of a 2nd order circuit by varying its various parameters and studying their effects on responses
9. Find the Q Factor and Bandwidth of a Series and Parallel Resonance circuit.
10. Determination of open circuit (Z) and short circuit (Y) parameters
11. Determination of hybrid (H) and transmission (ABCD) parameters
12. To measure two port parameters of a twin-T network and study its frequency response.

Hardware Requirements:

Regulated Power supplies, Analog/Digital Function Generators, Digital Multimeters, Decade Resistance Boxes/Rheostats, Decade Capacitance Boxes, Ammeters (Analog or Digital), Voltmeters (Analog or Digital), Active & Passive Electronic Components

Software requirements:

Multisim/ Pspice/Equivalent simulation software tool, Computer Systems with required specifications

References:

1. Network Analysis – ME Van Valkenburg, Prentice Hall of India, revised 3rd Edition, 2019.
2. Engineering Circuit Analysis by William H. Hayt, Jack Kemmerly, Jamie Phillips, Steven M. Durbin, 9th Edition 2020.

MALINENI LAKSHMAIAH
WOMEN'S ENGINEERING COLLEGE
(AUTONOMOUS)
(Accredited by "NBA" & NACC A+ Grade | Approved by AICTE, New Delhi & Affiliated to JNTUK, Kakinada)
Pulladigunta (Vil), Vatticherukuru (Md), Prathipadu Road, Guntur – 522 017 A.P.

DEPARTMENT OF ELECTRONICSAND COMMUNICATION ENGINEERING

Minutes of the First Board of Studies Committee Meeting

I. AGENDA

1. Change of faculty in BoS.
2. To Discuss the curriculum structure of Second Year B.Tech UG Programme(MR23).
3. To Discuss the curriculum structure of Second Year M.Tech PG Programme (MR23).
4. Any other point by the permission of Chair

II. LISTOFMEMBERSATTENDED

The second Board of Studies Committee of the ECE Department, MLEW, Guntur, has been instituted with effect from 06-09-23 (for a period of 3 years), with thefollowing members.

1. **Dr.B.T.Krishna**, Professor& Head, ECE, JNTUK, **University Nominee**
2. **Dr.VakulaD**, Professor, ECE, NIT Warangal, Subject Expert **(OutsideParentUniversity)**
3. **Dr.K.SrinivasaRao**,Professor&HeadofMicroelectronicsResearch,KLUniversity Subject Expert **(Outside Parent University)**
4. **Dr.Sudha Rani Suram,** Scientist 'G', DLRL, Hyderabad, **Industry Expert**
5. **E.R.Rajeswari,** Hardware Developer, IBM, Bangalore, **Alumni**
6. Dr.Chiluka Ramesh, Professor, Faculty Member
7. Dr.K.Swetha, Professor, Faculty Member
8. Mr.B.T.Madhav, Associate Professor, Faculty Member
9. Mr.Ch.Rama Koteswara Rao, Associate Professor, Faculty Member
10. Mr.Y.BhaskaraRao, Associate Professor, Faculty Member
11. Mr.T.VenkataRao, Assistant Professor, Faculty Member
12. Ms.Sk.Gousya Begum, Assistant Professor, Faculty Member

The Second Meeting of the BoS Committee of the ECE Department was held on 6th July,24 through online mode via Zoom platform at 11:00 a.m.

III. Minutes of the Second BoS Meeting of ECE Department:

1. Dr.D.VijayaSaradhi, BoS Chair, extended a cordial welcome to all the members of the BoSfor ECE, for the II BoS Meeting of ECE Department and introduced all the members.
2. Dr.D.VijayaSaradhi, BoS Chair informed the change in member of BoS. Mr.Sk.zilani replaced with Mr.Ch.Rama koteswara Rao
3. Dr.D.Vijaya Saradhi explained the Course Structure and number of credits being covered invarious categories for IInd B.Tech Ist and IInd Semesters.
4. Dr.D.Vijaya Saradhi detailed about the following subjects under II-I semester

   Probability theory and stochastic process
   Signals and Systems
   Electronic Devices and Circuits
   Switching Theory and Logic Design

5. Dr.D.Vijaya Saradhi detailed about the following labs and list of experiments under II-I semester

   Electronic Devices and Circuits Lab
   Switching Theory and Logic Design Lab
   Data Structures using Python

6. Dr.D.Vijaya Saradhi explained the detailed syllabus unit wise for II-Year I Semester subjects PTSP, S&S, EDC and STLD
7. Dr.D.Vijaya Saradhi detailed about the following subjects under II-II semester

   Linear Control Systems
   Electromagnetic Waves and Transmission Lines
   Electronic Circuit Analysis
   Analog Communications
   Design Thinking and Innovation

8. Dr.D.VijayaSaradhi detailed about the following labs and the list of experiments under II-II semester

   Electronic Circuit
   Analysis lab Signals
   and Systems Lab

9. Dr.D.VijayaSaradhi explained the detailed syllabus unit wise for II-Year, II Semester subjectsLCS, EMTL, ECA, AC, Design Thinking and Innovation.
10. The course structure and detailed syllabus for IIyear M.Tech in VLSI System & Design were proposed to the BOS.
11. The BOS Committee made constructive suggestions regarding the UG (II-Year B.Tech) Course Structure & Syllabus.
12. The BOS Committee made constructive suggestions regarding the PG (M.Tech)Course Structure& Syllabus.

13. After lengthy deliberations and progressive discussions, all the Members of the BoS for ECE have unanimously approved:

a) The II Year First and Second Semester Course Structure for ECE.

b) The II Year First and Second Semester Course Structure for VLSI System Design,

c) The Course Contents and Syllabus of First Year for M.Tech. Programme in VLSI System Design.

d) The BoS Committee formally authorized the BoS Chair of ECE Department, to include any minor modifications or corrections needed for the UG and PG Course Structures and Syllabus at later dates, if approved by the Academic Council.

1. Signatures of Members Present:

S.No.	Name of the Member	Designation and Address	Position	Signature
1	Dr.D.Vijaya Saradhi	Professor	Chairperson	
2	Dr.B.T.Krishna	Professor, ECE UCET,JNTUK	University Nominee	B.T. Krishna
3	Dr.Vakula.D	Professor, ECE. NIT, Warangal	Subject expert (Outside the Parent University)	D. Vakula
4	Dr.K.Srinivasa Rao	Professor, ECE KL University, Guntur	Subject expert (Outside the Parent University)	
5	Dr.Sudha Rani Suram	Scientist-G DLRL,HYD	Industry Expert	
6	Ms.E Raja Rajeswari	VLSI Hardware Developer IBM, Bangalore	Alumni	E.Rajarajeswari
7	Dr.Chiluka Ramesh	Professor	Internal Faculty Member	
8	Dr.K.Swetha	Professor	Internal Faculty Member	
9	Mr.B.T.Madhav	Associate Professor	Internal Faculty Member	
10	Mr.Ch.Rama Koteswarar Rao	Associate Professor	Internal Faculty Member	
11	Mr.Y.Bhaskara Rao	Associate Professor	Internal Faculty Member	
12	Mr.T.Venkata Rao	Assistant Professor	Internal Faculty Member	T. Venkata
13	Ms.Sk.Gousya Begum	Assistant Professor	Internal Faculty Member	

Chairman – BoS
Dept of ECE

HOD
Department of
Electronics & Communication Engineering
Malineni Lakshmaiah Women's Engineering College
Pulladigunta, GUNTUR-522017

MALINENI LAKSHMAIAH
WOMEN'S ENGINEERING COLLEGE
(AUTONOMOUS)

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Department of Mathematics
Minutes of the Board of Studies (BoS) Meeting

The second BoS meeting of Mathematics Department was conducted on 05.07.2024 from 09:30am through virtual mode via Zoom Online Meeting Platform.

Members Present :

S.No	Members	Name & Designation	Status of Attendance	Signature
1	Chairperson	Dr. A. Sri Krishna Chaithanya, Professor & HOD	PRESENT	
2	University Nominee	Dr. G.V.S.R. Deekshitulu Professor Of Mathematics UCEK,JNTU Kakinada Ph:**9849214404** Email:**dixitgvsr@gmail.com**	PRESENT	
3	Subject expert from outside the parent University	1. Dr. A.J.V. Radhika Asst. Professor of Mathematics ANU COLLEGE OF ENGINEERING &TECHNOLOGY Ph: **9885804900** Email: **ajvradhika09@gmail.com**	PRESENT	
		2.Dr. G.Srinivasa Rao Assoc. Professor of Mathematics VFSTR Deemed to be University, Guntur Ph:**9493132621** Email: **gsrinulakshmi77@gmail.com**	PRESENT	
4	Representative from Industry	Mr.Madhu Parvathaneni Madblocks Technologies Pvt Ltd C.E.O Ph: 7893015625 Email: maddy@makeskilled.com	PRESENT	
5	Alumni Member	Ms. Narne Vijaya Lakshmi 12KE1A1235 Ph: 9885529626 Email: Viji1995m.tech@gmail.com	PRESENT	
6	Member	Dr. P. Sri Lakshmi, Professor , MLWEC	PRESENT	
7	Member	Dr. K. Ramanjaneyulu Prof, MLWEC	PRESENT	
8	Member	Mr. Y.Suresh Asst.Prof, MLWEC	PRESENT	
9	Member	Mr. M.V.L Narayana Asst.Prof, MLWEC	PRESENT	
10	Member	Mr. G.Suresh, Asst.Prof, MLWEC	PRESENT	

11	Member	Ms. J.Sirisha Asst.Prof, MLWEC	PRESENT	
12	Member	Mrs R.Naga Sai Lakshmi Asst.Prof, MLWEC	PRESENT	R.NSLakshmi

Meeting Agenda:

Item No: 1

Discussion on Academic Regulations MR-23

Item No: 2

Discussion on Proposed Course Structure of II-B.Tech I-Sem and II-sem.

Item No: 3

Discussion on Proposed Syllabus of Courses Offered by Department in II B.Tech I-Sem and II-Sem.

Item No: 4

Any Other Points raised by BOS Members with the permission of chair

Resolutions:

Item No:1 - Discussion on Academic Regulations MR-23

At the onset, the Chairperson of BOS, Dr. A. Sri Krishna Chaitanya, welcomed all the members and introduced internal BOS members to external BOS members. The meeting began with presentation of proposed Academic Regulation MR23, and all the members are agreed for the same.

ItemNo:2 - Discussion on Proposed Course Structure of II B.Tech I-Sem & II -Sem

Proposed Course Structure offered by the Department of Mathematics is presented before the BOS Members and asked for the modifications if any, and it is ratified by all the members.

Course Structure:

II-B.Tech - I Semester for B.Tech. (CSE(AI&ML))

S.No.	Category	Title	L	T	P	Credits
1	BS&H	**Discrete Mathematics & Graph Theory**	3	0	0	3
2	BS&H	Universal human values – understanding harmony and Ethical human conduct	2	1	0	3
3	Engineering Science	Artificial Intelligence	3	0	0	3
4	Professional Core	Advanced Data Structures & Algorithms Analysis	3	0	0	3
5	Professional Core	Object Oriented Programming Through Java	3	0	0	3
6	Professional Core	Advanced Data Structures and Algorithms Lab	0	0	3	1.5

7	Professional Core	Object Oriented Programming Through Java Lab	0	0	3	1.5
8	Skill Enhancement course	Python programming	0	1	2	2
9	Audit Course	Environmental Science	2	0	0	-
Total			**16**	**2**	**8**	**20**

II-B.Tech - I Semester for B.Tech. (IT)

S.No.	Category	Title	L	T	P	Credits
1	BS&H	**Discrete Mathematics & Graph Theory**	3	0	0	3
2	BS&H	Universal human values – understanding harmony and Ethical human conduct	2	1	0	3
3	Engineering Science	Digital Logic &Computer Organization	3	0	0	3
4	Professional Core	Advanced Data Structures & Algorithms	3	0	0	3
5	Professional Core	Object Oriented Programming Through Java	3	0	0	3
6	Professional Core	Advanced Data Structures Lab	0	0	3	1.5
7	Professional Core	Object Oriented Programming Through Java Lab	0	0	3	1.5
8	Skill Enhancementcourse	Python Programming	0	1	2	2
9	Audit Course	Environmental Science	2	0	0	-
Total			**16**	**2**	**8**	**20**

II-B.Tech - I Semester for B.Tech. (CSE)

S.No.	Category	Title	L	T	P	Credits
1	BS&H	**Discrete Mathematics & Graph Theory**	3	0	0	3
2	BS&H	Universal human values – understanding harmony and Ethical human conduct	2	1	0	3
3	Engineering Science	Digital Logic & Computer Organization	3	0	0	3
4	Professional Core	Advanced Data Structures& Algorithm Analysis	3	0	0	3

5	Professional Core	Object Oriented Programming Through Java	3	0	0	3
6	Professional Core	Advanced Data Structures and Algorithm Analysis Lab	0	0	3	1.5
7	Professional Core	Object Oriented Programming Through Java Lab	0	0	3	1.5
8	Skill Enhancement Course	Python Programming	0	1	2	2
9	Audit Course	Environmental Science	2	0	0	-
Total			**16**	**2**	**8**	**20**

II-B.Tech - I Semester for B.Tech. (CSE(DS))

S.No.	Category	Title	L	T	P	Credits
1	BS&H	**Discrete Mathematics & Graph Theory**	3	0	0	3
2	BS&H	Universal human values – understanding harmony and Ethical human conduct	2	1	0	3
3	Engineering Science	Introduction to Data Science	3	0	0	3
4	Professional Core	Advanced Data Structures &Algorithms Analysis	3	0	0	3
5	Professional Core	Object-Oriented Programming ThroughJAVA	3	0	0	3
6	Professional Core	Data Science Lab	0	0	3	1.5
7	Professional Core	Object-Oriented Programming Through JAVA Lab	0	0	3	1.5
8	Skill Enhancement course	Python programming	0	1	2	2
9	Audit Course	Environmental Science	2	0	0	-
Total			**15**	**2**	**10**	**20**

II-B.Tech - I Semester for B.Tech.(Artificial Intelligence and Data Science(AI&DS))

S.No.	Category	Title	L	T	P	Credits
1	BS&H	**Discrete Mathematics & Graph Theory**	3	0	0	3
2	BS&H	Universal human values – understanding harmony and Ethical human conduct	2	1	0	3
3	Engineering Science	Database Management Systems	3	0	0	3

4	Professional Core	Advanced Data Structures Algorithms Analysis	3	0	0	3
5	Professional Core	Object Oriented Programming Through Java	3	0	0	3
6	Professional Core	Advanced Data Structures and Algorithms Analysis Lab	0	0	3	1.5
7	Professional Core	Object Oriented Programming Through Java Lab	0	0	3	1.5
8	Skill Enhancement course	Python Programming Lab	0	1	2	2
9	Audit Course	Environmental Science	2	0	0	-
Total			**16**	**2**	**8**	**20**

II-B.Tech -II Semester for B.Tech. (CSE(AI&ML))

S.No.	Category	Title	L	T	P	Credits
1	Management Course- I	Optimization Techniques	2	0	0	2
2	Engineering Science/ Basic Science	**Probability & Statistics**	3	0	0	3
3	Professional Core	Machine Learning	3	0	0	3
4	Professional Core	Database Management Systems	3	0	0	3
5	Professional Core	Digital Logic & Computer Organization	3	0	0	3
6	Professional Core	Machine Learning Lab	0	0	3	1.5
7	Professional Core	Database Management Systems Lab	0	0	3	1.5
8	Skill Enhancement course	Full Stack development-1	0	1	2	2
9	BS&H	Design Thinking &Innovation	1	0	2	2
Total			**15**	**1**	**12**	**21**
Mandatory Community Service Project Internship of 08weeks duration during summer vacation						

II-B.Tech -II Semester for B.Tech. (IT)

S.No.	Category	Title	L	T	P	Credits
1	Management Course- I	Optimization Techniques	2	0	0	2
2	Engineering Science/Basic Science	**Probability & Statistics**	3	0	0	3
3	Professional Core	Operating Systems	3	0	0	3
4	Professional Core	Database Management Systems	3	0	0	3
5	Professional Core	Software Engineering	3	0	0	3

6	Professional Core	Operating Systems & Software Engineering Lab	0	0	3	1.5
7	Professional Core	Database Management Systems Lab	0	0	3	1.5
8	Skill EnhancementCourse	Python with DJango	0	1	2	2
9	BS&H	Design Thinking & Innovation	1	0	2	2
Total			**15**	**1**	**10**	**21**
Mandatory Community Service Project Internship of 08 weeks duration during summer vacation						

II-B.Tech -II Semester for B.Tech. (CSE)

S.No.	Category	Title	L	T	P	Credits
1	Management Course-I	Managerial Economics and Financial Analysis	2	0	0	2
2	Engineering Science/ Basic Science	**Probability &Statistics**	3	0	0	3
3	Professional Core	Operating Systems	3	0	0	3
4	Professional Core	Database Management Systems	3	0	0	3
5	Professional Core	Software Engineering	2	1	0	3
6	Professional Core	Operating Systems Lab	0	0	3	1.5
7	Professional Core	Data base Management Systems Lab	0	0	3	1.5
8	Skill Enhancement Course	Full Stack Development–I	0	1	2	2
9	BS&H	Design Thinking &Innovation	1	0	2	2
Total			**14**	**2**	**10**	**21**
Mandatory Community Service Project Internship of 08 weeks duration during Summer vacation						

II-B.Tech -II Semester for B.Tech. (CSE(DS))

S.No.	Category	Title	L	T	P	Credits
1	Management Course- I	Optimization Techniques	2	0	0	2
2	Engineering Science/ Basic Science	**Statistical methods for Data science**	3	0	0	3
3	Professional Core	Data Engineering	3	0	0	3
4	Professional Core	DBMS	3	0	0	3
5	Professional Core	Digital Logic and Computer Organization	3	0	0	3
7	Professional Core	Data Engineering Lab	0	0	3	1.5
8	Professional Core	DBMS Lab	0	0	3	1.5

9	Skill Enhancement course	Exploratory Data Analysis with Python	0	1	2	2
10	BS&H	Design Thinking &Innovation	1	0	2	2
Total			**15**	**1**	**10**	**21**
Mandatory Community Service Project Internship of 08 weeks duration during summer Vacation						

II-B.Tech -II Semester for B.Tech.(Artificial Intelligence and Data Science(AI&DS))

S.No.	Category	Title	L	T	P	Credits
1	Management Course- I	Managerial Economic and Financial Analysis	2	0	0	2
2	Engineering Science/ Basic Science	**Statistical methods forData science**	3	0	0	3
3	Professional Core	Artificial Intelligence	3	0	0	3
4	Professional Core	Introduction to Data Science	3	0	0	3
5	Professional Core	Digital Logic& Computer Organization	3	0	0	3
6	Professional Core	Artificial Intelligence Lab	0	0	3	1.5
7	Professional Core	Data Science using Python Lab	0	0	3	1.5
8	Skill Enhancement course	Full Stack Development-1	0	1	2	2
9	BS&H	Design Thinking& Innovation	1	0	2	2
Total			**15**	**1**	**10**	**21**
Mandatory Community Service Project Internship of 08 weeks duration during summer vacation						

ItemNo:3- Discussion on Proposed Syllabus of Courses Offered by Department in IInd B.Tech I Semester & II Semester

Chairman presented the proposed Syllabus of II B.Tech I Semester & II B.Tech II Semester subjects of **Discrete Mathematics & Graph Theory ,Probability & Statistics and Statistical methods forData science.** All the members are ratified the syllabus presented.

Suggestions on Course Syllabus by the BoS Members:

1. **Changes in Discrete Mathematics & Graph Theory:**
   - Modified the few spellings mistakes and punctuation marks .
   - In Unit -II the topic " Lattice and its properties" shifted to after the topic "Hasse Diagrams"

- In Unit – V the topic " BFS and DFS spanning trees" shifted to after the topic "spanning trees"

2. **Changes in Probability &Statistics:**
   - In Unit –IV the topic " Central limit Theorem" shifted to before the topic "Point and interval Estimation" and changed the topic name "Estimation Using" by "Introduction to"

3. **Changes in Statistical methods forData science:**
   - In Unit –I eliminated the topic "Principal Components Analysis"

   And the modified Course Syllabus is attached herewith.

Finally, Chairperson of BOS thanked all the members of their valuable inputs and active participation in the meeting.

Chairperson
(Dr.A.Sri Krishna Chaitanya)
BOS-MATHEMATICS, MLWEC

MR23

MALINENI LAKSHMAIAH WOMEN'S ENGINEERING COLLEGE
(AUTONOMOUS)
Guntur-522017, Andhra Pradesh.

DEPARTMENT OF MATHEMATICS

II Year – I Sem		L	T	P	C
		3	0	0	3
DISCRETE MATHEMATICS AND GRAPH THEORY (Common to CSE, IT, CSE(AI&ML), CSE(DS), Artificial Intelligence and Data Science (AI&DS))					

Course Objectives:

- To introduce the students to the topics and techniques of discrete methods and combinatorial reasoning.
- To introduce a wide variety of applications. The algorithmic approach to the solutionof problems is fundamental in discrete mathematics, and this approach reinforces the close ties between this discipline and the area of computer science.

Course Outcomes: At the end of the course students will be able to

1. Build skills in solving mathematical problems (L3)
2. Comprehend mathematical principles and logic (L4)
3. Demonstrate knowledge of mathematical modeling and proficiency in using mathematical software (L6)
4. Manipulate and analyze data numerically and/or graphically using appropriate Software(L3)
5. How to communicate effectively mathematical ideas/results verbally or in writing(L1)

UNIT–I: Mathematical Logic:

Propositional Calculus: Statements and Notations, Connectives, Well Formed Formulae, Truth Tables, Tautologies, Equivalence of Formulae, Duality Law, Tautological Implications, Normal Forms, Theory of Inference for Statement Calculus, Consistency of Premises, Indirect Method of Proof.

Predicate Calculus: Predicates, Predicative Logic, Statement Functions, Variables and Quantifiers, Free and Bound Variables, Inference Theory for Predicate Calculus.

UNIT-II: Set Theory:

Sets: Operations on Sets, Principle of Inclusion-Exclusion.

Relations: Properties, Operations, Partition and Covering, Transitive Closure, Equivalence, Compatibility and Partial Ordering, Hasse Diagrams, Lattice and its Properties.

Functions: Bijective, Composition, Inverse, Permutation, and Recursive Functions.

UNIT-III: Combinatorics and Recurrence Relations:

Basis of Counting, Permutations, Permutations with Repetitions, Circular and Restricted Permutations, Combinations, Restricted Combinations, Binomial and Multinomial Coefficients and Theorems.

Recurrence Relations: Generating Functions, Function of Sequences, Partial Fractions, Calculating Coefficient of Generating Functions, Recurrence Relations, Formulation as Recurrence Relations, Solving Recurrence Relations by Substitution and Generating Functions, Method of Characteristic Roots, Solving Inhomogeneous Recurrence Relations.

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UNIT-IV: Graph Theory:

Basic Concepts, Graph Theory and its Applications, Subgraphs.

Graph Representations: Adjacency and Incidence Matrices, Isomorphic Graphs, Paths and Circuits, Eulerian and Hamiltonian Graphs.

UNIT-V: Multi Graphs:

Multigraphs, Bipartite and Planar Graphs, Euler's Theorem, Graph Colouring and Covering, Chromatic Number, Spanning Trees, BFS and DFS Spanning Trees, Prim's and Kruskal's Algorithms.

TEXT BOOKS:

1. Discrete Mathematical Structures with Applications to Computer Science, J. P.Tremblay and P. Manohar, Tata McGraw Hill.
2. Elements of Discrete Mathematics-A Computer Oriented Approach, C. L.Liu and D. P. Mohapatra, 3rd Edition, Tata McGraw Hill.

REFERENCE BOOKS:

1. Discrete Mathematics for Computer Scientists and Mathematicians, J. L.Mott, A.Kandel and T. P. Baker, 2nd Edition, Prentice Hall of India.
2. Discrete Mathematical Structures, Bernand Kolman, Robert C. Busby and SharonCutler Ross, PHI.
3. Discrete Mathematics, S. K. Chakraborthy and B.K. Sarkar, Oxford, 2011.
4. Discrete Mathematics and its Applications with Combinatorics and Graph Theory, K. H. Rosen, 7th Edition, Tata McGraw Hill.

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MALINENI LAKSHMAIAH WOMEN'S ENGINEERING COLLEGE
(AUTONOMOUS)
Guntur-522017, Andhra Pradesh.

DEPARTMENT OF MATHEMATICS

II Year – II Sem		L	T	P	C
		3	0	0	3
PROBABILITY AND STATISTICS **(Common to CSE, IT, CSE(AI&ML))**					

Course Objectives:

- To familiarize the students with the foundations of probability and statistical methods
- To impart probability concepts and statistical methods in various applications Engineering

Course Outcomes: Upon successful completion of this course, the student should be able to

1. Classify the concepts of data science and its importance (L2)
2. Interpret the association of characteristics and through correlation and regression tool (L4)
3. Apply discrete and continuous probability distributions (L3)
4. Design the components of a classical hypothesis test (L6)
5. Infer the statistical inferential methods based on small and large sampling tests(L4)

Unit – I: Descriptive statistics and methods for data science:

Data science – Statistics Introduction – Population vs Sample – Collection of data – primary and secondary data.

Type of variable: dependent and independent Categorical and Continuous variables – Data visualization – Measures of Central tendency – Measures of Variability – Skewness – Kurtosis.

UNIT – II: Correlation and Regression:

Correlation – Correlation coefficient – Rank correlation.

Linear Regression: Straight line – Multiple Linear Regression - Regression coefficients and properties.

Curvilinear Regression: Parabola – Exponential – Power curves.

UNIT – III: Probability and Distributions:

Probability– Conditional probability and Baye's theorem – Random variables – Discrete and Continuous random variables – Distribution functions – Probability mass function, Probability density function and Cumulative distribution functions – Mathematical Expectation and Variance – Binomial, Poisson, Uniform and Normal distributions.

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UNIT – IV: Sampling Theory:

Introduction – Population and Samples – Sampling distribution of Means and Variance (definition only), Central limit theorem (without proof) – Point and Interval estimations – Maximum error of estimate -- Introduction to t, χ^2 and F-distributions.

UNIT – V: Tests of Hypothesis:

Introduction – Hypothesis – Null and Alternative Hypothesis – Type I and Type II errors – Level of significance – One tail and two - tail tests .

Test of significance for large samples and Small Samples: Single and difference means – Single and two proportions – Student's t- test, F-test, χ^2 - test.

Text Books:

- **Miller and Freund's**, Probability and Statistics for Engineers,7/e, Pearson, 2008.
- **S. C. Gupta and V.K. Kapoor**, Fundamentals of Mathematical Statistics, 11/e, Sultan Chand & Sons Publications, 2012.

Reference Books:

- **Shron L. Myers, Keying Ye, Ronald E Walpole,** Probability and Statistics Engineers and the Scientists,8th Edition, Pearson 2007.
- **Jay l. Devore,** Probability and Statistics for Engineering and the Sciences, 8th Edition, Cengage.
- **Sheldon M. Ross**, Introduction to probability and statistics Engineers and the Scientists, 4th Edition, Academic Foundation, 2011.
- **Johannes Ledolter and Robert V. Hogg**, Applied statistics for Engineers and Physical Scientists, 3rd Edition, Pearson, 2010.

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MALINENI LAKSHMAIAH WOMEN'S ENGINEERING COLLEGE
(AUTONOMOUS)
Guntur-522017, Andhra Pradesh.

DEPARTMENT OF MATHEMATICS

II Year – II Sem		L	T	P	C
		3	0	0	3
STATISTICAL METHODS FOR DATA SCIENCE (Common to CSE(DS))					

Course Objectives:

- To familiarize the students with the foundations of probability and statistical methods
- To impart probability concepts and statistical methods in various applications Engineering

Course Outcomes: Upon successful completion of this course, the student should be able to

1. Classify the concepts of data science and its importance (L2)
2. Interpret the association of characteristics and through correlation and regression tool (L4)
3. Apply discrete and continuous probability distributions (L3)
4. Design the components of a classical hypothesis test (L6)
5. Infer the statistical inferential methods based on small and large sampling tests(L4)

Unit – I: Descriptive statistics and methods for data science:
Data science – Statistics Introduction – Population vs Sample – Collection of data – primary and secondary data.

Type of variable: dependent and independent Categorical and Continuous variables – Data visualization – Measures of Central tendency – Measures of Variability – Skewness – Kurtosis.

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UNIT – IV: Sampling Theory:
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MALINENI LAKSHMAIAH WOMEN'S ENGINEERING COLLEGE
(AUTONOMOUS)

DEPARTMENT OF MATHEMATICS

II Year – II Sem		L	T	P	C
		3	0	0	3
STATISTICAL METHODS FOR DATA SCIENCE					
(Common To Artificial Intelligence and Data Science (AI&DS))					

Course Objectives:

- This course aims at providing knowledge on basic concepts of Statistics,Estimation and testing of hypothesis for large and small samples.

Course Outcomes: Student will be able to

1. Analyze data and draw conclusion about collection of data and fitting of distributions
2. Analyzing the testing of hypothesis for Large and Small samples.
3. Develop skills in problem solving of the regression analysis
4. Understanding the significance of Time Series data in various fields
5. Understanding the classification using Logistic Regression.

UNIT – I: Data Visualization and Distributions:

Data Visualization Techniques: Introduction to Statistical methods- Exploratory Data Analysis- Charts (Line, Pie, Bar), Plots (Bubble, Scatter), Maps (Heat, Dot Distribution), Diagrams (Trees and Matrices).

Introduction to Data Distributions - Probability Distributions – discrete (binomial, Poisson), Continuous Distributions (Normal, exponential).

UNIT – II: Hypothesis Testing:

Introduction to Parametric Estimation - Parametric Confidence Intervals
Choosing a Statistic - Hypothesis Testing - Parametric test: the T-test - Applications to Hypothesis Tests - Pair wise comparisons.

UNIT- III: Linear Regression and Multiple Regression:

Regression: Linear Regression, Curvilinear Regression, Exponential Regression- Polynomial Regression- Power Model.

Practical Examples - The nature of the 'relationship' - Multiple Linear Regression - Important measurements of the regression estimate - Multiple Regression with Categorical Explanatory Variables - Inference in Multiple Regression - Variable Selection.

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UNIT -IV: Time Series:

Time series: Significance of Time series analysis, Components of Time series, Secular trend, Graphic method, Semi - average method, Method of moving averages, Method of least squares, straight line and non - linear trends, Logarithmic methods – Exponential trends, Growth curves, Seasonal Variations: Method of simple averages, Ratio-to-trend method, ratio-to-moving average method, Link relative method.

UNIT-V: Logistic Regression:

The classification problem - Logistic Regression Setup - Interpreting the Results - Comparing Models – Classification Using Logistic Regression.

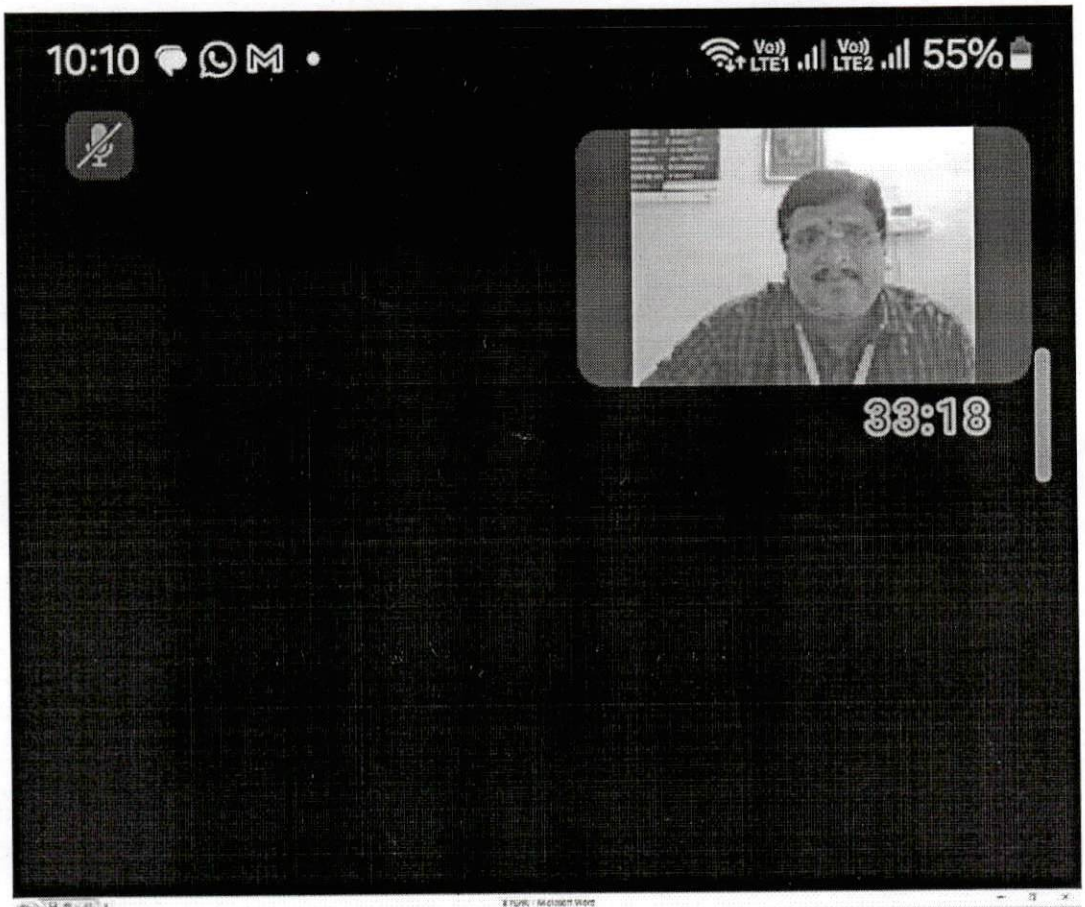
Textbooks:

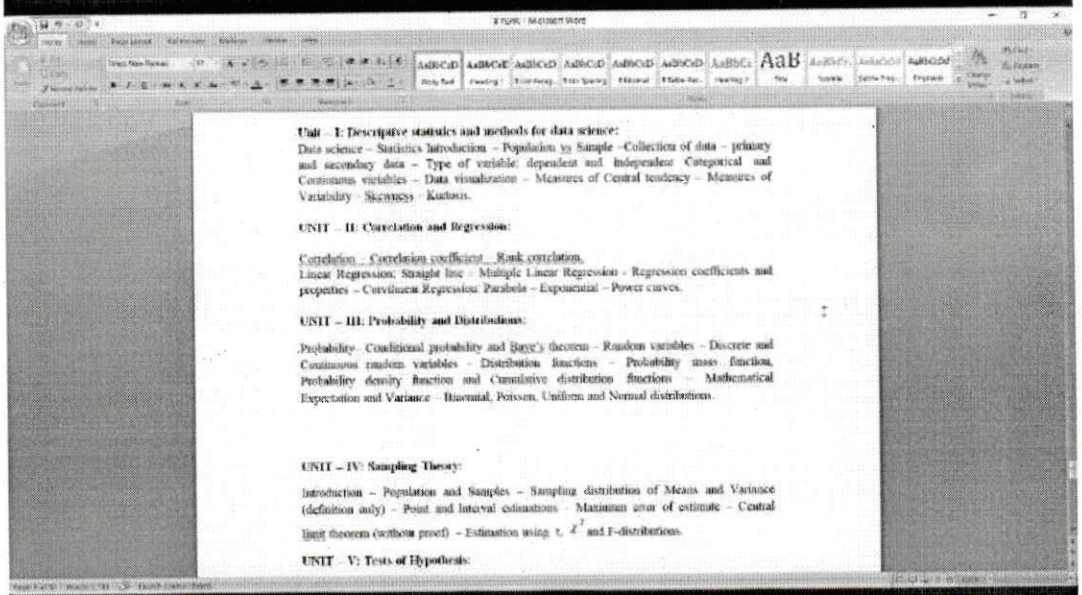
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2. K.Murugesan, P.Gurusamy , "Probability, Statistics and Random Processes"

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2. Robert V Hogg, Elliot A Tannis and Dale L.Zimmerman, Probability and StatisticalInference,9th edition, Pearson publishers,2013.
3. Chris Chatfield, "The analysis of time series an introduction," 5th edition, Chapman &Hall/CRC.
4. Peter J. Brockwell, Richard A.Davis, "Introduction to Time series and Forecasting,"Second edition, Springer.

Online Learning Resources: epurdom.github.io/Stat131A/Rsupport/index.html.





Unit – I: Descriptive statistics and methods for data science:
Data science – Statistics Introduction – Population vs Sample –Collection of data – primary and secondary data – Type of variable: dependent and Independent Categorical and Continuous variables – Data visualization – Measures of Central tendency – Measures of Variability – Skewness – Kurtosis.

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Correlation – Correlation coefficient – Rank correlation.
Linear Regression: Straight line – Multiple Linear Regression – Regression coefficients and properties – Curvilinear Regression: Parabola – Exponential – Power curves.

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Probability – Conditional probability and Bayes's theorem – Random variables – Discrete and Continuous random variables – Distribution functions – Probability mass function, Probability density function and Cumulative distribution functions – Mathematical Expectation and Variance – Binomial, Poisson, Uniform and Normal distributions.

UNIT – IV: Sampling Theory:

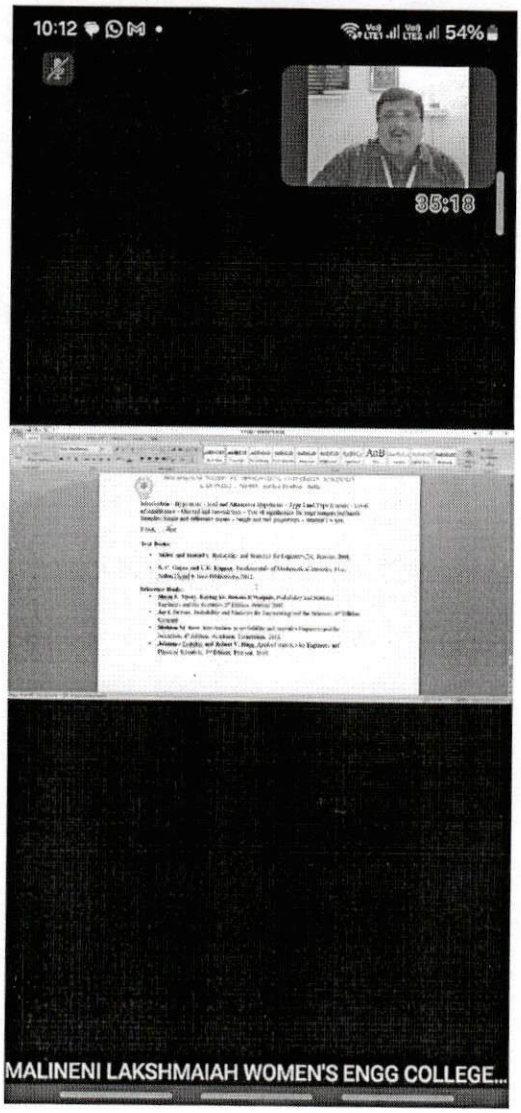
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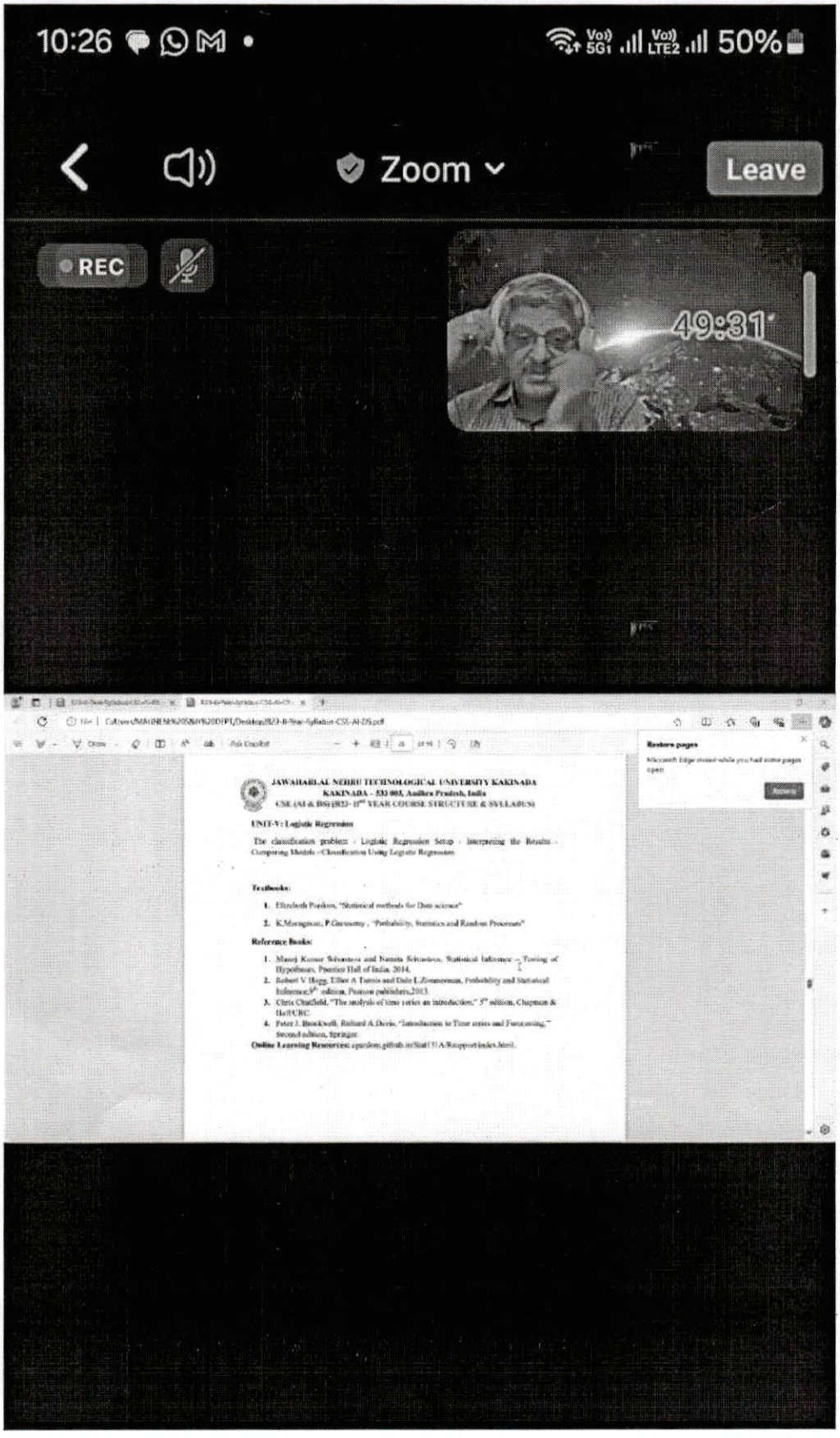
UNIT – V: Tests of Hypothesis:


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KAKINADA - 533 003, Andhra Pradesh, India
UNIT-V: Logistic Regression
The classification problem - Logistic Regression Setup - Interpreting the Results - Comparing Models - Classification Using Logistic Regression
Textbooks:
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2. K.Murugesan, P.Guruswamy , "Probability, Statistics and Random Processes"
Reference Books:
1. Manoj Kumar Srivastava and Namita Srivastava, Statistical Inference – Testing of Hypotheses, Prentice Hall of India, 2014.
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Online Learning Resources: cran.rstudio.github.io/Stat151A-Rsupport/index.html.

MALINENI LAKSHMAIAH
WOMEN'S ENGINEERING COLLEGE
(AUTONOMOUS)

(Accredited by "NBA" & NACC A+ Grade | Approved by AICTE, New Delhi & Affiliated to JNTUK, Kakinada)

Pulladigunta (Vil), Vatticherukuru (Md), Prathipadu Road, Guntur – 522 017 A.P.

Minutes of Board of Studies Meeting

Date: 23/07/2024

The first External Board of Studies Meeting of the Department of MBA was held online on 23.07.2024 at11:00AM in Zoom platform to finalize the syllabus for MBA III & IV and as well as B.Tech II/I &II semesters under R-23 regulations

The following members were present:

S.No.	Name of the BoS Member	Designation	Attendance	Signature
1	Mr P.KALYANA CHAKRAVARTHI	Chairman, Assoc Prof & HoD MBA	PRESENT	
2	DR A.Krishna Mohan	University Nominee and External BoS Member	PRESENT	
3	Dr.M.S.Narayana	Subject Expert and External BoS Member	PRESENT	
4	DrM.Siva Koti Reddy	Subject Expert and External BoS Member	PRESENT	
5	Mr P.Veeraiah	Assoc Prof, Member	PRESENT	
6	Mr G.Baji	Asst Prof, Member	PRESENT	
7	Mrs B.NagaSayamala	Asst Prof, Member	PRESENT	
8	Ms P.Kalayani	Asst Prof, Member	PRESENT	
9	Ms. J. Pravallika	Asst Prof, Member	PRESENT	
10	Mr.M.S.S Ganesh	Industry Expert and External BoS Member	PRESENT	
11	Mrs M.Bindu Priya	Member, Alumnus	ABSENT	

At the onset of the meeting, the Chairman of BoS, Assoc Prof P.Kalyan Chakravarthi, welcomed all the members and introduced members to the External Subject Experts. The meeting began with the presentation of curriculum by the chair for semesters II-I,II-II for P.G MBA and UG B.Tech II/I & II/II also,. He then presented the syllabus of all subjects of II-I and II-II semesters under R-19 regulations followed by presentation of syllabus of all subjects under R-19 regulations and for B.Tech II/I & II/II Semester Management Subjects

under R-23 regulations for approval, prepared by the internal BOS members.

Resolutions in Meeting

Agenda: To discuss and finalize the syllabus of the proposed P.G MBA II-I & II-II and also UG B.Tech II/I & II/II Semester courses of R-23 (Autonomous) regulations.

Resolutions: Syllabus of P.G MBA II-I & II-II and U.G B.Tech II/I & II/II Semester is approved by the Board of Studies Committee.

1. Encl: **Syllabus Copies for MBA II-I SEM & II-II SEM & B.Tech II/I & II/II Management subjects.**

General Comments

2. External BoS expert Pro A.Krishna Mohan enquired about internal and external evaluation procedures .Mr.P.Veeraiah explained the norms being followed at MLEW.
3. External BoS expert Dr.M.S. Narayana has asked to include year of publication and edition for the recommended text books in each subject.
4. External BoS expert Dr M.Siva Koti Reddy Suggested that students has to participate various Management activities to get more exposure regarding Industrial requirements and also to get real time experience.
5. The external BoS members expressed their satisfaction towards the contents for each subject prepared by the internal BoS members.
6. Chairman Mr P.Kalyan Chakravarthi informed the BoS members that the syllabus of core subjects is going to follow as per University Syllabus for PG MBA II/I & II/II and for U.G B.Tech II/I & II/II Management subjects.

Curriculum related Comments

Comments by Subject Expert and External BoS Member Prof A.Krishna Mohan:

1. Advised to conduct more activities and Intership for students exposure.
2. Suggested to conduct Webinars/Seminars for Students .
3. Suggested to do Online courses to acquire more Knowledge in their Subjects

Comments by Subject Expert and External BoS Member Dr.M.S. Narayana:

1. Opined to specify respective streams for Professional Electives mentioned in the curriculum.
2. Suggested to send students to More Industrial Visits.

MALINENI LAKSHMAIAH
WOMEN'S ENGINEERING COLLEGE
(AUTONOMOUS)

(Accredited by "NBA" & NACC A+ Grade | Approved by AICTE, New Delhi & Affiliated to JNTUK, Kakinada)

Pulladigunta (Vil), Vatticherukuru (Md), Prathipadu Road, Guntur – 522 017 A.P.

Sl.No	Course	Year	Sem	Name of the Subject	Branch
01	MBA	II	III & IV	All Subjects	MBA
02	B.Tech	II	I	Universal Human Values – Understanding Harmony and Ethical Human Conduct	All Branches
03	B.Tech	II	II	Managerail Economics and Financial Analysis	All Branches Except IT & CS(DS)
04	B.Tech	II	II	Optimization Techniques	IT & CS(DS)
05	B.Tech	II	II	Soft Skills	ECE

Signature of External Member 1

Signature of External Member 2

Signature Industry Expert

Signature Of University Nominee

(Mr P.KALYANA CHAKRAVARTHI)

Chairman, BoS

Comments by Industry Expert and External BoS Member Mr.M.S.S.Ganesh:

1. Mr.M.S.S Ganesh suggested that Students has to learn some additional Courses mandatory Like SAP,HCM, etc in view of the importance of this course in Placements.
2. Mr.M.S.S Ganesh also suggested that Students has to Improve Communication Skills and Soft Skills.

According to the comments made by the Subject Experts and Industry Expert, the Chairman Mr P.Kalyan Chakravarthi decided to implement the following

1. To Conduct More activity oriented Sessions to Improve students Creative Skills and Innovative thinking.
2. To conduct more Internship Programs, to get Industrial Exposure.
3. To conduct Guest Lectures with Industrial Experts to know about opportunities in various sectors and their requirements.
4. As subject codes will be assigned by the Examination Cell, the Chairman decided to follow those subject codes in the course structure, as decided by the exam cell as per autonomous regulations.
5. Domain names shall be included for each pool of Professional Electives.
6. Students has to participate in Internships programs to get exposure for MBA students.
7. As per R-23 JNTU Kakinada curriculum & Course structure for P.G Final Year(III & IV Semester) & U.G Subjects for B.Tech II/I & II Semester Subjects has been approved Without any Changes in this BoS meeting. B.Tech Subjects are as follows

II YEAR III SEMESTER							
S.No	Course Code	Courses	Marks	L	T	P	C
1	C-301	Strategic Management	100	4	0	0	4
2	C -302	Operations Research	100	4	0	0	4
3	E -301	Elective – 1	100	4	0	0	3
4	E-302	Elective – 2	100	4	0	0	3
5	E-303	Elective – 3	100	4	0	0	3
6	E-304	Elective – 4	100	4	0	0	3
7	C-304	Industrial Project based on Summer Internship	150	4	0	0	4
		Total	**750**	**28**	**0**	**0**	**24**

II YEAR IV SEMESTER							
S.No	Course Code	Courses	Marks	L	T	P	C
1	C -401	Supply Chain Management and Analytics	100	4	0	0	4
2	C-402	Innovation and Entrepreneurship	100	4	0	0	4
3	E-401	Elective – 5	100	4	0	0	3
4	E-402	Elective – 6	100	4	0	0	3
5	E-403	Elective – 7	100	4	0	0	3
6	E-404	Elective – 8	100	4	0	0	3
7	C-403	Comprehensive Viva- voce	50	0	0	0	2
		Total Marks / Credits	**650**	**28**	**0**	**0**	**22**
			2800				**102**

*The project work documentation shall be checked with anti plagiarism software (Turnitin). Thepermissible similarity shall be less than 30%.

*Comprehensive Viva is to verify the student knowledge as a whole from which he was studied during the twoyear course work.

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III-SEMESTER

Human Resource Management

S. no	Course Code	SUBJECT TITLE
1	EH-301	Leadership and Change Management
2	EH-302	Performance Evaluation and Compensation Management
3	EH-303	Human Resource Metrics and Analytics
4	EH-304	Human Capital Management
5	EH-305	Manpower Planning, Recruitment, and Selection

IV-SEMESTER

Human Resource Management

S. no	Course Code	SUBJECT TITLE
1	EH-401	Labor Welfare and employment laws
2	EH-402	International HRM
3	EH-403	Employee Relations and Engagement
4	EH-404	Human Resources Development
5	EH-405	Strategic HRM

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III - SEMESTER FINANCE

S. no	Course Code	SUBJECT TITLE
1	EF-301	Investment Analysis and Portfolio Management
2	EF-302	Managing Banks and Financial Institutions
3	EF-303	Financial Markets and Services
4	EF-304	Mergers, Acquisitions and Corporate Restructuring
5	EF-305	Taxation

IV - SEMESTER FINANCE

S. no	Cours eCode	SUBJECT TITLE
1	EF-401	Financial Derivatives
2	EF-402	Global Financial Management
3	EF-403	Financial Risk Management
4	EF-404	Strategic Financial Management
5	EF-405	Behavioral Finance

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B.Tech II- Year/I - Semester

Sl.No:	Name of the Subject	L	T	P	C
01	Universal human values – Understanding Harmony and Ethical Human Conduct	2	1	0	3

B.Tech II- Year/II - Semester

Sl.No:	Name of the Subject	L	T	P	C
01	Managerial Economic and Financial Analysis	2	0	0	2
02	Optimization Techniques	2	0	0	2
03	Soft Skills	0	1	2	2

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C- 402	INNOVATION AND ENTREPRENEURSHIP	100	4	0	0	4

UNIT I

Entrepreneurship: Definition of Entrepreneur, Entrepreneurial motivation and barriers; Internal and external factors; Types of entrepreneurs; Theories of entrepreneurship; Classification of entrepreneurship. Creativity and Innovation: Creative Problems Solving, Creative Thinking, Lateral Thinking, Views of De Bono, Khandwalaand others, Creative Performance in terms of motivation and skills.

UNIT II

Creativity and Entrepreneurial Plan: Idea Generation, Screening and Project Identification, Creative Performance, Feasibility Analysis: Economic, Marketing, Financial and Technical; Project Planning, Evaluation, Monitoring and Control, segmentation, Targeting and positioning of Product, Role of SIDBI in Project Management.

UNIT III

Operation problems: Incubation and Take-off, Problems encountered Structural, Financial and Managerial Problems, Types of Uncertainty. Institutional support for new ventures: Supporting organizations; Incentives and facilities; Financial Institutions and Small-scale Industries, Govt. Policies for SSIs.

UNIT IV

Family and non-family entrepreneurs: Role of Professionals, Professionalism vs. family entrepreneurs, Role of Woman entrepreneur, Sick industries, Reasons for Sickness, Remedies for Sickness, Role of BIFR in revival, Bank Syndications.

Unit V

Introduction to Innovation management, Managing Innovation within Firms, Business strategy & organization Knowledge, New Product Strategy & Managing New Product Development, Role of Technology in Management of innovation, Managing for Intellectual Property Right.

References:

1) Couger, C-Creativity and Innovation (IPP, 1999)
2) Nina Jacob, -Creativity in Organisations (Wheeler, 1998)
3) Jonne&Ceserani-Innovation & Creativity(Crest) 2001.
4) BridgeSetal-Understanding Enterprise: Entrepreneurship and Small Business (Palgrave,2003)
5) Holt-Entrepreneurship: New Venture Creation (Prentice-Hall) 1998.
6) Singh P&Bhanderkar A-Winning the Corporate Olympiad:TheRenaissan cearadigm(Vikas)
7) Dollinger M J-Entrepreneurship (Prentice-Hall, 1999).
8) Tushman, M.L. & Lawrence, P.R. (1997)-Managing Strategic Innovation & Change Oxford .
9) Jones T. (2003)-Innovating at the Edge: How Organizations Evolve and Embed Innovation Capability.Butterwork Heinemann, U. K.
10) Amidon, D. M.(1997)-Innovation Strategy for the Knowledge Economy:The Kanawakening. Butterwork-Heinemann, New Delhi, India.

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IV SEMESTER CORE PAPERS

C-401	SUPPLY CHAIN MANAGEMENT AND ANALYTICS	100	4	0	0	4

UNIT - I

Basics of Supply Chain Management: Introduction to Supply Chain Management – Evolution- Different views of Supply Chain – Supply Chain Strategy – Supply Chain Drivers – Developing Supply Chain Strategy- Strategic fit in Supply Chain. Analytics in Supply Chain Management.

UNIT – II

Supply Chain Analysis - Types of Supply Chains - Advanced Planning - Structure of Advanced -Planning Systems-Strategic Network Planning - Demand Planning - Master Planning - Demand Fulfilment and ATP - Production Planning and Scheduling Purchasing and Material Requirements Planning Distribution and Transport – Planning - Coordination and Integration - Collaborative Planning.

UNIT – III

Set covering and Set Partitioning Problems, Travelling Salesman Algorithms, Advanced Vehicle Routing Problem Heuristics, Scheduling Algorithms-Deficit function Approach and Linking Algorithms.

UNIT- IV

Fuzzy Logic and Techniques-Application in SCM - Recent issues in SCM: Role of computer/IT in supply chain management, CRM Vs SCM, Benchmarking concept, features and implementation, outsourcing –basic concepts, value addition in SCM – concept of demand chain management.

UNIT- V

Inventory Management in Supply Chain- Network Design in Supply Chain- Alternative Channels of Distribution- Location Decisions in Supply Chain-Implementing Advanced Planning Systems - The Definition of a Supply - Chain Project -The Implementation Process- SCM in a Pharmaceutical – Company Food and Beverages - Computer Assembly Semiconductor
– Manufacturing.

Suggested Readings:

1. Mohanty R.P, S.G Deshmuki -Supply Chain Managementl Biztantra, New Delhi
2. Sunil Chopra, Peter Meindl, Supply Chain Management ,Pearson Education, India.

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IV - SEMESTER ELECTIVE PAPERS
Human Resource Management

EH-402	INTERNATIONAL HUMAN RESOURCE MANAGEMENT	100	4	0	0	3

UNIT I

Introduction: A Global HR Perspective in New Economy-Challenges of Globalization - Implications of Managing People and Leveraging Human Resource - Strategic Role of International HRM – Distinction between Domestic and International HRM – HR Challenges atInternational Level.

UNIT II

Managing International Assignments: Significance -Global HR Planning – Staffing policy – Training and development – performance appraisal –International Labour relations – Industrial democracy - Positioning Expatriate – Repatriate – factors of consideration - Strategies - Legal content of Global HRM- International assignments for Women - Problems.

UNIT III

Cross Culture Management: Importance – Concepts and issues – Understanding Diversity – Managing Diversity Cross- Cultural Theories – Hofstede's Model – Kluchkohn - Strodthbeck Model – Andre-Laurent' Theory – Cultural Issues. considerations - Problems – Skill building methods – Cross Culture Communication and Negotiation – Cross Culture Teams. Talent crunch – Indian MNCs and Challenges.

UNIT IV

Compensation Management: Objectives -Importance – Concepts- Trends - Issues – Methods – Factors of Consideration – Models – incentive methods – Approaches of Compensation in Global Assignments - global compensation implications on Indian systems - PerformanceManagement.

UNIT V

Global Strategic Advantages through HRD: Measures for creating global HRD Climate – Strategic Frame Work of HRD and Challenges - Globalization and Quality of Working Life and Productivity – Challenges in Creation of New Jobs through Globalization- New Corporate Culture.

Relevant cases have to be discussed in each unit and in examination case is compulsory from any unit.

References:

1. Subba Rao P: -International Human Resource Management‖, Himalaya Publishing House, Hyderabad, 2011
2. NilanjanSen Gupta: -International Human Resource Management Text and cases‖ Excel Books, New Delhi.
3. Tony Edwards :—International Human Resource Management‖, Pearson Education, New Delhi, 2012
4. Aswathappa K, Sadhana Dash: -International Human Resource Management, TMH, New Delhi,
5. Monir H Tayeb: -International Human Resource Management‖, Oxford Universities Press, Hyderabad, 2012.

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EH-403	EMPLOYEE RELATIONS AND ENGAGEMENT	100	4	0	0	3

UNIT I :

Industrial Relations Management: Concept-meaning and scope of IR-system frame work-Theoretical perspective- Evaluation –Background of industrial Relations in India- Influencing factors of IR in enterprise and the consequences. Globalization and IR- Recent Trends in Industrial Relations.

UNIT II:

Trade Unions: Introduction-Definition and objectives-growth of Trade Unions in India -Union recognition-Union Problems-Employees Association- Collective Bargaining –Characteristics-Importance-Principles-The process of CB-Participation in the bargaining process-Essential conditions for the success of collective bargaining –Negotiating techniques and skills.

UNIT III:

Employee Grievances: Causes of Grievances – Grievances Redressal Machinery – Discipline in Industry _ Measures for dealing with Indiscipline–Standing Orders- Code Discipline.

UNIT IV:

Industrial Disputes: Meaning, nature and scope of industrial disputes - Cases and Consequences of Industrial Disputes –Prevention and Settlement of industrial disputes in India.

UNIT V :

Employee Engagement : Concept-Definition-Elements- Factors- Levels - Driers of Employee Engagement-Measurement-Strategies- The role of managers in engaging the employees.

Relevant cases have to be discussed in each unit and in examination case is compulsory from any unit.

References

1. C.S Venkataratnam: -Industrial Relations , Oxford University Press, New Delhi, 2011
2. Sinha: -Industrial Relations, Trade Unions and Labour Legislation , Pearson Education, New Delhi, 2013
3. Mamoria: —Dynamics of Industrial Relations , Himalaya Publishing House, New Delhi, 2010
4. B.D.Singh: -Industrial Relations Excel Books, New Delhi, 2010
5. Arun Monappa: -Industrial Relations , TMH, New Delhi. 2012
6. Prof. N.Sambasiva Rao and Dr. Nirmal Kumar: -Human Resource Management and Industrial Relations , Himalaya Publishing House, Mumbai
7. Ratna Sen: -Industrial Relations , MacMillon Publishers, New Delhi, 2011

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EH-404	HUMAN RESOURCES DEVELOPMENT	100	4	0	0

UNIT-I:

Concept of HRD-objectives-Structure-Need-Scope- HRD in selected industrial organisations-significance-HRD functions-Framework-Techniques-Attributes of a HRD manager.

UNIT – II:

HRD Strategies:- An Overview - Strategies - Training and Development - Methods - Evaluation of training programmes. HRD Process Model: Methods of Implantation, Evaluation of HRD programmes. Identification of HRD needs and Design and development of HRD programmes.

UNIT – III:

HRD interventions: Mentoring for employee development: Concepts of Mentoring-Perspectives-Mentoring relationship-Outcomes of Mentoring programmes-Design and implementation of formal-mentoring programmes-Barriers to mentoring-Role of mentoring in development, understanding the role and responsibilities of mentor, mentee-Special issues in Mentoring.

UNIT – IV:

Employee counselling for HRD: Overview of counselling programmes, employee assistance programme, stress management, employee wellness and health promotion. Career Planning, management, and development: Career development stages and activities, role of individual and organization in career planning, Issues in career management.

UNIT-V :

The future of HRD and HRD Ethics: Research, practice and education of HRD for innovation and talent development and management, Role of HRD in developing ethical attitude and behaviour and development, Ethical problems with HRD roles. Applications of HRD: HRD Climate, HRD for managing organizational change, HRD for Workers (blue collar employees), HRD Audit.

Relevant cases have to be discussed in each unit and in examination case is compulsoryfrom any unit.

References:

1. Arun Monappa; Personnel Management;
2. Rudrabasava Raj M.N. : Dynamic Personnel Administration Management of HumanResources;
3. Udai Pareek, Human Resource Development;
4. S. Ravishankar & R.K. Mishra (Ed). : Management of Human Resources in PublicEnterprises;
5. Haribson F, Educational Planning and Human Resources Development, International Institute for Education, UNESCO, Paris;
6. Bell DJ, Planning Corporate' Manpower, Longman; 7,
Walker James W'. Human Resource Planning, MGH.

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EH-405	STRATEGIC HUMAN RESOURCE MANAGEMENT	100	4	0	0	3

UNIT-I

Human Resource Strategy: Introduction to Strategic Human Resource Management - Evaluationobjectives and Importance of Human Resources Strategy- Strategic fit – A conceptual framework -Human Resources contribution to strategy - Strategy driven role behaviours and practices – Theoretical Perspectives on SHRM approaches - Linking business strategies to HR strategies.

UNIT-II

Strategic Human Resource Planning: Objectives, benefits, levels of strategic planning -Activitiesrelated to strategic HR Planning-Basic overview of various strategic planning models-Strategic HR Planning model-Components of the strategic plan.

UNIT-III

Strategy Implementation: Strategy implementation as a social issue-The role of Human Resource-Work force utilization and employment practices-Resourcing and Retention strategies-Reward and Performance management strategies.

UNIT-IV

Strategic Human Resource Development: Concept of Strategic Planning for HRD Levels in Strategic HRD planning-Training and Development Strategies-HRD effectiveness.

UNIT-V

Human Resource Evaluation: Overview of evaluation - Approaches to evaluation, Evaluation Strategic contributions of Traditional Areas - Evaluating Strategic Contribution of Emerging Areas-HR as a Profit centre and HR outsourcing strategy.

Relevant cases have to be discussed in each unit and in examination case is compulsory from any unit.

References:

1. Charles R. Greer: –Strategic Human Resource Management‖ - A General Manager Approach - Pearson Education, Asia
2. Fombrum Charles & Tichy: –Strategic Human Resource Management‖ - John Wiley Sons, 1984
3. Dr. Anjali Ghanekar –Strategic Human Resource Management‖ Everest Publishing House, Pune 2009
4. Tanuja Agarwala –Strategic Human Resource Management‖ Oxford University Press, New Delhi 2014 www.universityupdates.in || www.android.universityupdates.in || www.ios.universityupdates.in www.universityupdates.in || www.android.universityupdates.in || www.ios.universityupdates.in University Updates
5. Srinivas R Kandula –Strategic Human Resource Development‖ PHI Learning PVT Limited, New Delhi 2009
6. Dreher, Dougherty –Human Resource Strategy‖ Tata Mc Graw Hill Publishing Company Limited, New Delhi 2008

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EF-303	FINANCIAL MARKETS AND SERVICES	100	4	0	0	3

Objective: To enlighten the students with the Concepts and Practical dynamics of Financial Markets and Financial Services

UNIT – I : Structure of Financial System – role of Financial System in Economic Development – Financial Markets and Financial Instruments – Capital Markets – Money Markets – Primary Market Operations – Role of SEBI – Secondary Market Operations – Regulation – Functions of Stock Exchanges – Listing – Formalities – Financial Services Sector Problems and Reforms.

UNIT – II : Financial Services: Concept, Nature and Scope of Financial Services – Regulatory Frame Work of Financial Services – Growth of Financial Services in India – Merchant Banking – Meaning-Types – Responsibilities of Merchant Bankers – Role of Merchant Bankers in Issue Management – Regulation of Merchant Banking in India. Leasing – types of Leases – Evaluation of Leasing Option Vs. Borrowing.

UNIT – III : Venture Capital – Growth of Venture Capital in India – Financing Pattern under Venture Capital – Legal Aspects and Guidelines for Venture Capital. Factoring, Forfeiting and Bill Discounting – Types of Factoring Arrangements – Factoring in the Indian Context.

UNIT – IV : Credit Rating – Meaning, Functions – Debt Rating System of CRISIL, ICRA and CARE. Mutual Funds – Concept and Objectives, Functions and Portfolio Classification, Organization and Management, Guidelines for Mutual Funds. Working of Public and Private Mutual Funds in India. Debt Securitization – Concept and Application – De-mat Services-need and Operations-role of NSDL and CSDL.

UNIT – V : Microfinance: Over view of Microfinance, Indian Rural financial system,introduction to Microfinance, Microfinance concepts, products, (savings, credit, insurance, pension, equity, leasing, hire-purchase service, Microfinance in kind, Micro-remittances, MicroSecuritization. Microfinance models: Generic models viz. SHG, Grameen, and Co- operative, variants SHG NABARD model, SIDBI model, SGSY model, Grameen Bangladesh model, credit unions. Poverty and Need of Microfinance. Gender issues in Microfinance

Suggested Readings:

1. Bhole & Mahakud, Financial Institutions and Market, TMH, New Delhi
2. V.A.Avadhani, Marketing of Financial Services, Himalayas Publishers, Mumbai
3. DK Murthy, and Venugopal, Indian Financial System, IK Int Pub House
4. Anthony Saunders and MM Cornett, Fin Markets & Institutions,TMH,
5. Edminister R.D., Financial Institution, Markets and Management.
7. Punithavathy Pandian, Financial Markets and Services, Vikas, New Delhi

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EF-302	MANAGING BANKS AND FINANCIAL INSTITUTIONS	100	4	0	0	3

Unit – I: Financial System in India: Introduction - Evolution of Banking - Phases of development - RBI and the Financial System - Committees on Banking Sector Reforms - Prudential Banking -- RBI Guidelines and directions.

Unit – II: Organization, Structure and Functions of RBI and Commercial Banks: Introduction - Origination, Structure and Functions of RBI and Commercial Banks - Role of RBI and Commercial Banks - Lending and Operation policies - Banks as Intermediaries - NBFCs - Growth of NBFCs - FDI in Banking Sector - Banking Regulations - Law and Practice.

Unit – III: Risk Management in Banks : Introduction - Asset/Liability Management Practices - Credit Risk Management - Credit Risk Models - Country Risk Management - Insurance Regulations and Development Authority (IRDA).

Unit – IV: Financial Institutions and Development Banking : Introduction - Origin, Growth and Lending Policies of Terms lending Institutions - Working of IDBI - IFCI - STCs - SIDBI - LIC - GIC - UTI - Role of Financial Institutions in Capital Market.

Unit – V: New Financial Instruments and Institutions : Private Banks - Old generation and New generation private banks - Foreign Banks - NSE - Depositories - DFHI - New Equity and Debt Instruments - SEBI and RBI guidelines.

Suggested Readings:

1. Koch W Timothy and Scott S Macdonald, "Bank Management" Thomson (South-Western), Bangalore 2005 (Text Book)
2. Khan M Y., "Indian Financial System", Tata Mc Graw Hill, New Delhi, 2004
3. Srivastava, RM ., "Management of Indian Financial Institutions", Himalaya Publishing House, Mumbai, 2005
4. Avadhani V A., "Investments and Securities Markets in India", Himalaya Publishing House, Mumbai, 2004
5. Srinivasan NP and Saravanavel, P., "Development Banking in India and Abroad", Kalyani Publications, Ludhiyana, 2001

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III. SEMESTER ELECTIVES FINANCE
MBA III SEMESTER

EF-301	INVESTMENT ANALYSIS AND PORTFOLIO MANAGEMENT	100	4	0	0	3

Objective: To enlighten the students with the Concepts and Practical applications of Security Analysis and Portfolio Management

Unit-I: Concept of Investment, Investment Vs Speculation, and Security Investment Vs Non- security Forms of Investment-Investment Environment in India. Investment Process - Sources of Investment Information, Security Markets – Primary and Secondary – Types of securities in Indian Capital Market, Market Indices. Calculation of SENSEX and NIFTY.

Unit-II: Return and Risk – Meaning and Measurement of Security Returns. Meaning and Types of Security Risks: Systematic Vs Non-systematic Risk. Measurement of Total Risk - Intrinsic Value Approach to Valuation of Bonds - Preference Shares and Equity Shares.

Unit-III: Fundamental Analysis – Economy, Industry and Company Analysis, Technical Analysis – Concept and Tools and Techniques Analysis – Technical Analysis Vs Fundamental Analysis - Efficient Market Hypothesis; Concept and Forms of Market Efficiency.

Unit-IV: Elements of Portfolio Management, Portfolio Models – Markowitz Model, Efficient Frontier and Selection of Optimal Portfolio. Sharpe Single Index Model and Capital Asset Pricing Model, Arbitrage Pricing Theory.

Unit-V: Performance Evaluation of Portfolios; Sharpe Model – Jensen's Model for PF Evaluation, Evaluation of Mutual Fund.

Suggested Readings:

1. Fisher DE and Jordon RJ, Security Analysis and Portfolio Management,PHI, New Delhi
2. Ambika Prsasad Dash, Security Analysis and Portfolio Management,IK Int Pub House, NewDelhi
3. Hirt and Block, Fundamentals of Investment Management, TataMcGrawHill, New Delhi
4. Reily Frank K, Investment Analysis and Portfolio Management,Cengage, New Delhi
5. Bodie,Kane,Marcus and Mohanty, Investments, TataMcGraw Hill, New Delhi
6. Peter Lynch, One Up on Wall Street, Simon & Schuster Paperbacks, New York
7. Sharppe W, Alexander,GJ., & Baily JV., Investments, TMH, New Delhi

8. Avadhani, VA, SAPM, Himalaya Publishers.

9. Bhalla, VK Investment Management, S.Chand., New Delhi

10. Preeti Singh, Investment Management, Himalaya Publishers.

11. Timothy Vick, How to Pick Stocks like Warren Buffett, TMH, New Delhi

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EH-305	MANPOWER PLANNING, RECRUITMENT, AND SELECTION	100	4	0	0	3

Unit I

Basics of Human Resource Planning: Macro Level Scenario of Human Resource Planning-Factors affecting HRP -Concepts and Process of Human Resource Planning - Methods and Techniques of Demand Forecasting - Methods and Techniques of Supply Forecasting - Micro Level Planning.

Unit II

Manpower Planning, Human Resource Planning and Business Environment; Defining and Drawing Manpower Systems- Stocks and Flows; Human Resource Distribution Mapping and Identifying Surplus; Downsizing Strategies- Legal and voluntary framework.

Unit III

Analysis, design and evaluation of job: nature of job analysis, process, methods of collecting job data, potential problems with job analysis-job design-contemporary issues-job evaluation – process-methods.

Unit IV

Recruiting and selecting the right talent: recruitment and selection needs-recruitment process-alternative to recruitment-selection process-evaluation-barriers to effective selection-making the selection effective.

Unit V

Training and Development: Overview of training and development systems, organizing training department, training and development policies, linking training and development to company's strategy, Requisites of Effective Training, Training Needs Assessment (TNA) Designing Training and Development Programs Evaluation of Training and Development.

Relevant cases have to be discussed in each unit and in examination case is compulsory from any unit.

References:

1. Prior, John, Handbook of Training and Development, Jaico Publishing House, Bombay.
2. Trvelove, Steve, Handbook of Training and Development, Blackwell Business.
3. Warren, M.W. Training for Results, Massachusetts, Addison-Wesley.
4. Craig, Robert L., Training and Development Handbook, McGraw Hill.
5. Garner, James, Training Interventions in Job Skill Development, Addison-Wesley.
6. Mathis, Jackson,Tripathy:—Human Resource Management:Asouth-Asin Perspectivel, Cengage Learning, New Delhi, 2013
7. Subba Rao P: –Personnel and Human Resource Management-Text and Cases‖, Himalaya Publications, Mumbai, 2013.

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EH-303	HUMAN RESOURCE METRICS AND ANALYTICS	100	4	0	0	3

Objective of the Course: Objective of the course is to provide knowledge in developing right HR metrics and analytics based on the organizational requirements. This will lay foundation in pruning HR metrics into Analytics for effective management decisions.

Unit 1

HR Metrics Overview--Concepts, Objectives-- Historical evolution of HR metrics.--Explain howand why metrics are used in an organization--Deciding what metrics are important to your business--HR metrics design principles--Approaches for designing HR metrics--The Inside-Out Approach--The Outside-In Approach-- Align HR metrics with business strategy, goals andobjectives--Link HR to the strategy map--

Unit II

Creating levels of metrics measures—HR Effeciency measures—HR Effectiveness measures-- HR value / impact measures. Building HR functions metrics-- Workforce Planning Metrics-- Recruitment Metrics -- Training & Development Metrics-- Compensation & Benefits Metrics -- Employee relations & Retention Metrics

Unit III

HR Analytics Overview -- What HR Analytics. -- Importance of HR Analytics. -- Translating HR metrics results into actionable business decisions for upper management (Using Excel Application exercises, HR dashboards)-- HR information systems and data sources-- HR Metricsand HR Analytics-- Intuition versus analytical thinking-- HRMS/HRIS and data sources-- Analytics frameworks like LAMP-- HCM:21(r) Model.

Unit IV

Diversity Analysis-- Equality, diversity and inclusion, measuring diversity and inclusion, Testing the impact of diversity, Workforce segmentation and search for critical job roles..Recruitment and Selection Analytics--Evaluating Reliability and validity of selection models, Finding out selection bias.Predicting the performance and turnover. Performance Analysis-- Predicting employee performance, Training requirements, evaluating training and development.

UNIT V:

Optimizing selection and promotion decisions. Monitoring impact of Interventions-- Tracking impact interventions-- Evaluating stress levels and value-change-- Formulating evidence based practices and responsible investment-- Evaluation mediation process, moderation and interaction analysis.

References

1. Edwards Martin R, Edwards Kirsten (2016),-Predictive HR Analytics: Mastering the HR Metric‖,Kogan Page Publishers, ISBN-0749473924
2. Fitz-enz Jac (2010), -The new HR analytics: predicting the economic value of your company's human capital investments‖, AMACOM, ISBN-13: 978-0-8144-1643-3
3. Fitz-enz Jac, Mattox II John (2014), -Predictive Analytics for Human Resources‖, Wiley, ISBN-1118940709
4. Bernard Marr(2018), Data Driven HR:How to use Analytics and metrics to data driven performance,Kindle Edition.

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EH-302	PERFORMANCE EVALUATION AND COMPENSATFION MANAGEMENT	100	4	0	0	3

Unit- I:

Introduction: –Definition –concerns-scope-Historical developments in performance management-Over view of performance management-Process for managing performance- Importance –Linkage of PM to other HR processes-Performance Audit.

Unit- II:

Performance Management Planning: Introduction-Need-Importance-Approaches-The Planning Process—Planning Individual Performance- Strategic Planning –Linkages to strategic planning- Barriers to performance planning-Competency Mapping-steps-Methods.

Unit-III:

Management System: objectives – Functions- Phases of Performance Management System- Competency, Reward and Electronic Performance Management Systems-Performance Monitoring and Counselling: Supervision- Objectives and Principles of Monitoring- Monitoring Process- Periodic reviews- Problem solving- engendering trust-Role efficiency- Coaching- Counselling and Monitoring- Concepts and Skills .

UNIT -IV:

Compensation: concept and definition – objectives and dimensions of compensation program – factors influencing compensation –Role of compensation and Reward in Modern organizations Compensation as a Retention strategy- aligning compensation strategy with business strategy - Managing Compensation: Designing a compensation system – internal and external equity– pay determinants - frame work of compensation policy - influence of pay on employee attitude and behaviour - the new trends in compensation management at national and international level.

UNIT V:

Compensation Structure: Compensation Structure -History and past practices, elements of ,management compensation –Types of compensation system-Performance based and Pay based structures-Designing pay structures-comparison in evaluation of different types of pay structures-Significance of factors affecting-Tax Planning –Concept of Tax planning-Role of tax planning in compensation benefits-Tax efficient compensation package-Fixation of tax liability salary restructuring.

Relevant cases have to be discussed in each unit and in examination case is compulsory from anyunit.

References

1. Prem Chadha: —Performance Management‖, Macmillan India, New Delhi, 2008.
2. Michael Armstrong & Angela Baron, -Performance Management‖: The New Realities, Jaico Publishing House, New Delhi, 2010.
3. T.V.Rao, -Appraising and Developing Managerial Performance‖, Excel Books, 2003.
4. David Wade and Ronad Recardo, -Corporate Performance Management‖, Butter Heinemann, New Delhi, 2002.
5. Dewakar Goel: -Performance Appraisal and Compensation Management‖, PHI Leaarning, New Delhi, 2009
6. A.M. Sarma -Performance Management Systems‖ Himalaya Publishing House, New Delhi, 2010.

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C-302	OPERATIONS RESEARCH	100	4	0	0	4

Unit – I:

Importance-The History of OR-Definition-Features-Scope of Operations Research –Linear Programming: Introduction-Advantages of using LP-Application areas of LP- Formation of mathematical modelling, Graphical method, the Simplex Method; Justification, interpretation of Significance of All Elements In the Simplex Tableau, Artificial variable techniques: Big M method.

UNIT II:

Transportation, Assignment Models: Definition and application of the transportation model, methods for finding initial solution-tests for optimality-variations in transportation problem, the Assignment Model, Travelling Salesman Problem.

Unit – III:

Dynamic Programming – Applications of D.P. (Capital Budgeting, Production Planning, Solving Linear Programming Problem) – Integer Programming -- Branch and Bound Method.

Unit – IV :– Game Theory: Introduction – Two Person Zero-Sum Games, Pure Strategies, Games with Saddle Point, Mixed strategies, Rules of Dominance, Solution Methods of Games without Saddle point – Algebraic, matrix and arithmetic methods. Simulation – Simulation Inventory and Waiting Lines.

Unit – V:

P.E.R.T. & C.P.M. and Replacement Model: Drawing networks – identifying critical path –probability of completing the project within given time- project crashing – optimum cost andoptimum duration. Replacement models comprising single replacement and group replacement. **Relevant cases have to be discussed in each unit and in examination case is compulsoryfrom any unit.**

References:

1. Winston, Operations Research, Cengage, ND
2. Anand Sharma, Operations Research, Himalaya Publishing House, 3. Kalavarthy, S. Operations Research, Vikas Publishers House Pvt Ltd.,
4. Mcleavey & Mojena, Principles of Operations Research for Management, AITBS publishers,
5. V.K.Kapoor, Operation Research Techniques for Management, Sultan Chand & Sons,
6. Richard Bronson & Govindasami Naadimuthu, SCHAUM'S OUTLINE OF THEORY & PROBLEMS OF Operations Research, 2nd Ed., Tata Mc Graw-Hill Edition,
7. JK Sharma Operation Research – Theory and Applications, MacMillan.

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III SEMESTER CORE PAPERS C- 301. STRATEGIC MANAGEMENT

C-301	STRATEGIC MANAGEMENT	100	4	0	0	4

UNIT-I

Introduction: Concepts in Strategic Management, Strategic Management as a process – Developing a strategic vision, Mission, Objectives, Policies – Factors that shape a company's strategy – Crafting a strategy.

UNIT-II

Environmental Scanning: Industry and Competitive Analysis -Evaluating company resources and competitive capabilities – SWOT Analysis – Strategies and competitive advantages in diversified companies and its evaluation. Tools and techniques- Porter's Five Force Model, BCG Matrix, GE Model,

UNIT-III

Strategy Formulation : Strategy Framework For Analyzing Competition, Porter's Value Chain Analysis, Competitive Advantage of a Firm, Exit and Entry Barriers - Formulation of strategy at corporate, business and functional levels. Types of Strategies

UNIT-IV

Strategy Implementation : Strategy and Structure, Strategy and Leadership, Strategy and culture connection - Operationalising and institutionalizing strategy- Organizational Values and Their Impact on Strategy – Resource Allocation – Planning systems for implementation.

UNIT-V

Strategy Evaluation and control – Establishing strategic controls - Measuring performance – appropriate measures- Role of the strategist – using qualitative and quantitative benchmarking to evaluate performance - strategic information systems – problems in measuring performance – Strategic surveillance -strategic audit

References

1. P.Subba Rao: Business Policy and Strategic Management, Himalaya Publishing House, New Delhi, 2010
2. Kazmi: Strategic Management and Business Policy, Tata McGraw Hill, 2009
3. R.Srinivasn: Strategic Management, PHI Learning, New Delhi, 2009
4. Adrian Haberberg & Alison: Strategic Management, Oxford University Press, New Delhi, 2009

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III - SEMESTERELECTIVES (HUMAN RESOURCE MANAGEMENT)

EH-301	LEADERSHIP AND CHANGE MANAGEMENT	100	4	0	0	3

Unit I:

Organisational Leadership: Definition, Components and evaluation of leadership, factors of leadership, Situational Leadership Behaviour: Meaning, Fiedler Contingency Model, Path Goal and Normative Models - Emerging Leadership Behaviour: Transformational, Transactional and Visionary Leadership - Leadership for the new Millennium Organisations - Leadership in Indian Organisations. Leadership Effectiveness: Meaning, Reddins' 3-D Model, Hersey and Blanchard Situational Model, Driving Leadership Effectiveness, Leadership for Organisational Building.

Unit II:

Leadership Motivation, Culture: Motivation Theories for Leadership- Emerging Challenges in Motivating Employees. Motivation, Satisfaction, Performance.Organisational Culture: Meaning, Definitions, Significance, Dimensions, Managing Organisational Culture, Changing organisational Cultural.Leadership Development: Leadership development: Significance – Continuous Learning: Principles of learning to develop effective leadership – Vision and Goals for organisation: significance of goals for leaders – Charting vision and goals of Indian leaders and abroad.

Unit III:

Strategic Leadership: Leader Self management: significance - Developing self esteem and balancing emotions – Interpersonal Leadership Skills: Praise – Criticise – Communicate – Leadership Assertiveness: Circle of influence and circle of concern – Leadership with Edification: Tools of edification – Leadership and creativity: Developing creative thinking – Leadership and Team Building: Principles of team building, individual versus Group versus Teams – Leadership and Integrity: Developing character and values.

UNIT IV:

Basics of Change Management: Meaning, nature and Types of Change – change programmes – change levers – change as transformation – change as turnaround – value based change.

UNIT V:

Mapping change: The role of diagramming in system investigation – A review of basic flow diagramming techniques –systems relationships – systems diagramming and mapping, influence charts, multiple cause diagrams- a multidisciplinary approach -Systems approach to change: systems autonomy and behavior – the intervention strategy model – total project management model (TPMM). Organization Development (OD): Meaning, Nature and scope of OD - Dynamics of planned change – Person-focused and role-focused OD interventions –Planning OD Strategy – OD interventions in Indian Organizations – Challenges to OD Practioners

Relevant cases have to be discussed in each unit and in examination case is compulsory from any unit.

Reference Books:

1. Peter G. Northouse, Leadership, 2010, Sage. Publication.
2. Richard L. Daft -Leadership‖ Cengage Learning 2005.
3. Uday Kumar Haldar -Leadership and Team Building‖ Oxford Higher Education 2010
4. Richard L Hughes, Robert C Ginnett, Gordon J Curphy -Leadrship‖ Tata Mc Graw Hill Education Private Limited 2012.
5. Peter Lornge, Thought leadership Meets Business, 1st edition, 2009, Cambridge.
6. Cummings: -Theory of Organisation Development and Change‖, Cengage Learning, New Delhi, 2013.
7. Robert A Paton: Change Management, Sage Publications, New Delhi, 2011. 3. NilanjanSengupta: Managing Changing Organisations, PHI Learning, New Delhi, 2009

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EF-305	TAXATION	100	4	0	0	3

Objective: To acquaint the students with the theoretical and practical aspects of direct taxes including wealth taxes.

Unit –I: General Principles of Tax – Direct and Indirect Taxes – State Power to Levy Tax – Tax System – Provisions of Income Tax Act 1961 – Finance Act – Basic Concepts.

Unit- II: Income Tax – Deductions, Computation, Payment and Accounting- deductions from Gross Total Income, Rebates and Reliefs and Computation of Taxable Income and Tax Payable, Filing of Income Tax Returns – Provisions, Forms and Due Dates, Notices and Assessments.

Unit III: Tax Planning for Firms, HUFs and AOPs- partnership firm under Income Tax Law, tax deductions available to firms, Provisions relating to interest and remuneration paid to partner, Computation of partnership firms' book profit, Set-off and carry-forward of losses of Firms and taxation of HUFs and Associations of Persons (AOPs).

Unit IV: Corporate Taxation- Computation of taxable income, Carry-forward and set-off of losses for companies, Minimum Alternative Tax (MAT), Set-off and Carry-forward of Amalgamation Losses, Tax Planning for Amalgamation, Merger and Demerger of Companies, Tax Provisions for Venture Capital Funds

Unit V: Tax Audit and Accounting for Income Tax - Tax Audit, Qualities and Qualifications Required in Tax Auditors, Forms, Reports and Returns and Tax Reporting and Disclosure in Financial Statements

Suggested Readings:

1. Dr. V.K. Singhania & Dr. Kapil Singhania, Direct Taxes Law and Practice, Taxman Publications Pvt. Ltd., New Delhi.

2. Bhagavati Prasad, Direct Taxes Law and Practice, Wishwa Prakashan, New Delhi.

3. Dinkar Pagare, Income Tax and Practice, Sultan Chand and Sons, New Delhi.

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FINANCE

MBA IV SEMESTER

EF-401	FINANCIAL DERIVATIES	100	4	0	0	3

Objective: To enlighten the students with the concepts and practical applications of derivatives in the security markets.

Unit - I: Introduction to Financial Derivatives – Meaning and Need – Growth of Financial Derivatives in India – Derivative Markets – Participants- Functions – Types of Derivatives – Forwards – Futures – Options-Swaps – The Regulatory Framework of Derivatives Trading in India.

Unit - II: Features of Futures –Differences Between Forwards and Futures – Financial Futures – Trading – Currency Futures – Interest Rate Futures – Pricing of Future Contracts- Value at Risk (VaR)-Hedging Strategies – Hedging with Stock Index Futures – Types of Members and Margining System in India – Futures Trading on BSE & NSE.

Unit - III: Options Market – Meaning & Need – Options Vs Futures -Types of Options Contracts – Call Options – Put Options- Trading Strategies Involving Options – Basic Option Positions – Margins – Options on Stock Indices – Option Markets in India on NSE and BSE.

Unit - IV: Option Pricing – Intrinsic Value and Time Value- Pricing at Expiration – Factors Affecting Options pricing- Put-Call Parity Pricing Relationship- Pricing Models - Introduction to Binominal Option Pricing Model – Black Scholes Option Pricing Model.

Unit – V: Swaps – Meaning – Overview – The Structure of Swaps – Interest Rate Swaps – Currency Swaps – Commodity Swaps – Swap Variant – Swap Dealer Role –Equity Swaps – Economic Functions of Swap Transactions - FRAs and Swaps.

Suggested Readings:

1. Hull C. John, –Options, Futures and Other Derivatives‖, Pearson Educations Publishers,
2. David Thomas. W & Dubofsky Miller. Jr., Derivatives valuation and Risk Management, Oxford University, Indian Edition.
3. ND Vohra & BR Baghi, Futures and Options, Tata McGraw-Hill Publishing Company Ltd.
4. Red Head: Financial Derivatives: An Introduction to Futures, Forward, Options‖ Prentice Hallof India.
5. David A. Dubofsky, Thomas W. Miller, Jr.: Derivatives: Valuation and Risk Management, Oxford University Press.
6. Sunil K.Parameswaran, –Futures Markets: Theory and Practice‖ Tata-McGraw-Hill Publishing Company Ltd.
7. D.C. Patwari, Financial Futures and Options, Jaico Publishing House.
8. T.V. Somanathan, Derivatives, Tata McGraw-Hill Publishing Company Ltd.
9. NSE Manual of Indian Futures & Options & www. Sebi.com
10. S.C. Gupta, Financial Derivatives: Theory, Concepts and Problems, Prentice Hall of India.

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EF-402	GLOBAL FINANCIAL MANAGEMENT	100	4	0	0	3

Objective: to enlighten the students with the Concepts and Practical applications of Gobal Financial Management.

Unit I : International Monetary and Financial System: Evolution; Breton Woods Conference and Other Exchange Rate Regimes; European Monetary System, South East Asia Crisis and Current Trends.

Unit II : Foreign Exchange Risk: Transaction Exposure; Accounting Exposure and Operating Exposure – Management of Exposures – Internal Techniques, Management of Risk in Foreign Exchange Markets: Forex Derivatives – Swaps, futures and Options and Forward Contracts.

Unit III : Features of Different International Markets: Euro Loans, CPs, Floating Rate Instruments, Loan Syndication, Euro Deposits, International Bonds, Euro Bonds and Process of Issue of GDRs and ADRs.

Unit IV : Foreign Investment Decisions : Corporate Strategy and Foreign Direct Investment; Multinational Capital Budgeting; International Acquisition and Valuation, Adjusting for Risk in Foreign Investment.

Unit V: International Accounting and Reporting; Foreign Currency Transactions, MultinationalTransfer Pricing and Performance Measurement; Consolidated Financial Reporting.

Suggested Readings:

1. Buckley Adrin, Multinational Finance, 3rd Edition, Engle Wood Cliffs, Prentice Hall of India.
2. S.P.Srinivasan, B.Janakiram, International Financial Management, Wiley India, New Delhi.
3. Clark, International Financial Management, Cengage, ND
4. V.Sharan, International Financial Management, 3rd Edition, Prentice Hall of India.
5. A.K.Seth, International Financial Management, Galgothia Publishing Company.
6. P.G.Apte, International Financial Management, Tata McGrw Hill, 3rd Edition.
7. Bhalla, V.K., International Financial Management, 2nd Edition, New Delhi, Anmol, 2001.
8. V.A.Avadhani, International Financial Management, Himalaya Publishing House.
9. Bhalla, V.K., Managing International Investment and Finance, New Delhi, Anmol, 1997.

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EF-403	FINANCIAL RISK MANAGEMENT	100	4	0	0	3

Objective: To equip the students with adequate knowledge and Skill to understand and manage the risk and uncertainties to which financial institutions are exposed to.

Unit – I: Introduction The concept of Risk, Nature, Need and scope of risk. Source, measurement, identification and evaluation of Risk. Types of risk–Product market risk andcapital market risk. Possible Risk events, Risk Indicators, Risk Management Process–pre- requisites and fundamentals. Misconceptions of Risk. An integrated approach to Corporate Risk Management. Risk management approaches and methods. A comprehensive view of Risk in Financial Institutions. Risk reporting process–internal and external.

Unit – II: Measurement and Management of Risk: Value at risk (VaR): The concept, computation, stresses testing, back testing. Cash flow at risk (CaR): VaR and CaR to make investment decisions. Managing risk when risk is measured by VaR or CaR Non-Insurance methods of Risk Management-Risk Avoidance, Loss Control, Risk Retention and Risk Transfer. Asset-Liability Management (ALM): evolution & concept, RBI guidelines. Capital Adequacy. Management of interest rate risk, liquidity risk, credit risk and exchange rate risk.

Unit – III: Techniques and Tools of Risk Management: Forward contracts and Futures contracts The concept of Derivatives and types of Derivatives. The role of Derivative securities to manage risk and to exploit opportunities to enhance returns. Individuals, speculators, hedgers, arbitrageurs and other participants in Derivatives Market. Forward contracts: Definition, featuresand pay-off profile of Forward contract. Valuation of forward contracts. Forward Contracts to manage Commodity price risk, Interest rate risk and exchange rate risk. Limitations of Forward contract. Futures contracts: Definition. Clearing house, margin requirements, marking to the market. Basis and convergence of future price to spot price. Valuation of Futures contract. Differences between forward contracts and futures contracts. Risk management with Futures contracts–the hedge ratio and the portfolio approach to a risk–minimizing hedge.

Unit – IV: Techniques and Tools of Risk Management: SWAPS Definition, types of swaps. Interest rate swaps, Currency swaps. Interest rate Swaps: Mechanics of Interest rate swaps
.Using Interest rate Swaps to lower borrowing costs, hedge against risk of rising and falling interest rates. Valuation of interest rate Swaps. Pricing of Interest rate swaps at origination and valuing of Interest rate swaps after origination. Currency Swaps: Types of Currency Swaps. Valuation of currency swaps. Using Currency Swaps to lower borrowing costs in foreign country, to hedge against risk of a decline in Revenue, to hedge against risk of an increase in Cost, to hedge against risk of a decline in the value of an asset, to hedge against risk of a rise in the value of a liability. Pricing of currency swap at origination and valuing of currency swap after origination.

Unit – V: Techniques and Tools of Risk Management: Options Definition of an option. Types ofoptions: call option, put option, American option and European option. Options in the money, at the money and out of the money. Option premium, intrinsic value and time value of options. Pricing of call and put options at expiration and before expiration. Options on stock indices and currencies. The Binominal option pricing model (BOPM): assumptions - single and two period models. The Black & Scholes option pricing model (BSOPM): assumptions.

Suggested Readings:

1. Dun and Bradstreet, –Financial Risk Management‖, 2007, TMH, Delhi.
2. Paul Hopkins, Kogan Page, –Fundamentals of Risk Management‖, 2010, Institute of Risk Management.
3. Ravi Kumar, –Asset Liability Management‖, Vision Books Pvt. Ltd.
4. David. A. Dubofsky & Thomas. W. Miller, Jr., –Derivatives Valuation and Risk Management‖, 2003, Oxford University Press.
5. Jean-Philippe Bouchaud and Mark Potters, –Theory of Financial Risk and Derivative Pricing‖, 2009, 2nd Ed. Cambridge press
6. John C. Hull & Sankarshan Basu, –Options, Futures and Other Derivatives‖, 7th Ed, Pearson Education.
7. –Theory and Practice of Treasury and Risk Management in Banks‖, Indian Institute of Banking and Finance, March 2006, Taxmann
8. Peter S. Rose & Sylvia C. Hudgins, –Bank Management & Financial Services‖, 7th Ed, Tata McGraw-Hill
9. Rene. M. Stulz, –Risk Management & Derivatives‖, 2003, Thomson Southwestern.
10. Jayanth Rama Varma, –Derivatives and Risk Management‖, TMH.

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EF-404	STRATEGIC FINANCIAL MANAGEMENT	100	4	0	0	3

Objective: To enlighten the students with the Concepts and Practical applications of Strategic Financial Management., with particular reference to the financial strategy and value of the enterprise.

Unit-1: Financial Goals and Strategy – Shareholder Value Creation (SCV): Market Value Added(MVA) – Market-to-Book Value (M/BV) – Economic Value Added (EVA) – Managerial Implications of Shareholder Value Creation.

Unit-II: Financial Strategy for Capital Structure: Leverage Effect and Shareholders' Risk – Capital Structure Planning and Policy – Financial Options and Value of the Firm – Dividend Policy and Value of the Firm.

Unit-III: Investment Strategy – Techniques of Investment Appraisal Under Risk and Uncertainty – Risk Adjusted Net Present Value – Risk Adjusted Internal Rate of Return – Capital Rationing – Decision Tree Approach for Investment Decisions – Evaluation of Lease Vs Borrowing Decision.

Unit-IV: Merger Strategy – Theories of Mergers – Horizontal and Conglomerate Mergers – Merger Procedure – Valuation of Firm – Financial Impact of Merger – Merge and Dilution Effect on Earnings Per Share – Merger and Dilution Effect on Business Control.

Unit-V: Takeover Strategy – Types of Takeovers – Negotiated and Hostile Bids – Takeover Procedure – Takeover Defenses – Takeover Regulations of SEBI – Distress Restructuring Strategy – Sell offs – Spin Offs – Leveraged Buyouts.

Suggested Readings:

1. Van Horn, JC, Financial Management and Policy, Prentice Hall,New Delhi
2. PG Godbole, Mergers, Acquisitions and Corporate Restructuring, Vikas, New Delhi
3. Weaver, Strategic Corporate Finance, Cengage, ND
4. Weston JF, Chung KS & Heag SE., Mergers, Restructuring & Corporate Control, PrenticeHall.
5. GP Jakarthiya, Strategic Financial Management, Vikas, New Delhi
6. Coopers & Lybrand, Strategic Financial: Risk Management, Universities Press (India) Ltd.
7. Robicheck, A, and Myers, S., Optimal Financing Decisions, Prentice Hall Inc.
8. James T.Gleason, RiskL The New Management Imperative in Finance, A Jaico Book.

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II Year-I Semester

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UNIVERSAL HUMAN VALUES – UNDERSTANDING HARMONY AND ETHICAL HUMAN CONDUCT

Course Objectives:

- To help the students appreciate the essential complementary between 'VALUES' and 'SKILLS' to ensure sustained happiness and prosperity which are the core aspirationsof all human beings?
- To facilitate the development of a Holistic perspective among students towards life and profession as well as towards happiness and prosperity based on a correct understanding of the Human reality and the rest of existence. Such holistic perspective forms the basis of Universal Human Values and movement towards value-based living in a natural way.
- To highlight plausible implications of such a Holistic understanding in terms of ethical human conduct, trustful and mutually fulfilling human behaviour and mutually enriching interaction with Nature.

Course Outcomes:

- Define the terms like Natural Acceptance, Happiness and Prosperity (L1, L2)
- Identify one's self, and one's surroundings (family, society nature) (L1, L2)
- Apply what they have learnt to their own self in different day-to-day settings inreal life (L3)
- Relate human values with human relationship and human society. (L4)
- Justify the need for universal human values and harmonious existence (L5)
- Develop as socially and ecologically responsible engineers (L3, L6)

Course Topics

The course has 28 lectures and 14 tutorials in 5 modules. The lectures and tutorials are of 1- hour duration. Tutorial sessions are to be used to explore and practice what has been proposed during the lecture sessions.

The Teacher's Manual provides the outline for lectures as well as practice sessions. The teacher is expected to present the issues to be discussed as propositions and encourage the students to have a dialogue.

UNIT I

Introduction to Value Education (6 lectures and 3 tutorials for practicesession)

Lecture 1: Right Understanding, Relationship and Physical Facility (HolisticDevelopment and the Role of Education)

Lecture 2: Understanding Value Education

Tutorial 1: Practice Session PS1 Sharing about Oneself Lecture 3: self-exploration as the Process for Value Education

Lecture4: Continuous Happiness and Prosperity – the Basic HumanAspirations

Tutorial 2: Practice Session PS2 Exploring Human ConsciousnessLecture 5: Happiness and Prosperity – Current Scenario

Lecture 6: Method to Fulfill the Basic Human Aspirations Tutorial 3: Practice Session PS3 Exploring Natural Acceptance

UNIT II Harmony in the Human Being (6 lectures and 3 tutorials for practice session) Lecture 7: Understanding Human being as the Co-existence of the self and thebody.

Lecture 8: Distinguishing between the Needs of the self and the body

Tutorial 4: Practice Session PS4 Exploring the difference of Needs of self andbody.

Lecture 9: The body as an Instrument of the selfLecture 10: Understanding Harmony in the self

Tutorial 5: Practice Session PS5 Exploring Sources of Imagination in the selfLecture 11: Harmony of the self with the body

Lecture 12: Programme to ensure self-regulation and Health

Tutorial 6: Practice Session PS6 Exploring Harmony of self with the body.

UNIT III Harmony in the Family and Society (6 lectures and 3 tutorials for practicesession)

Lecture 13: Harmony in the Family – the Basic Unit of Human InteractionLecture 14: 'Trust' – the Foundational Value in Relationship

Tutorial 7: Practice Session PS7 Exploring the Feeling of TrustLecture 15: 'Respect' – as the Right Evaluation

Tutorial 8: Practice Session PS8 Exploring the Feeling of Respect Lecture 16: Other Feelings, Justice in Human-to-Human RelationshipLecture 17: Understanding Harmony in the Society

Lecture 18: Vision for the Universal Human Order

Tutorial 9: Practice Session PS9 Exploring Systems to fulfil Human Goal

UNIT IV Harmony in the Nature/Existence (4 lectures and 2 tutorials for practicesession)

Lecture 19: Understanding Harmony in the Nature

Lecture 20: Interconnectedness, self-regulation and Mutual Fulfilment amongthe Four Orders of Nature

Tutorial 10: Practice Session PS10 Exploring the Four Orders of NatureLecture 21: Realizing Existence as Co-existence at All Levels

Lecture 22: The Holistic Perception of Harmony in Existence
Tutorial 11: Practice Session PS11 Exploring Co-existence in Existence.

UNIT V **Implications of the Holistic Understanding – a Look at Professional Ethics (6 lectures and 3 tutorials for practice session)**
Lecture 23: Natural Acceptance of Human Values
Lecture 24: Definitiveness of (Ethical) Human Conduct
Tutorial 12: Practice Session PS12 Exploring Ethical Human Conduct
Lecture 25: A Basis for Humanistic Education, Humanistic Constitution and Universal Human Order
Lecture 26: Competence in Professional Ethics
Tutorial 13: Practice Session PS13 Exploring Humanistic Models in Education
Lecture 27: Holistic Technologies, Production Systems and Management Models-Typical Case Studies
Lecture 28: Strategies for Transition towards Value-based Life and Profession

Tutorial 14: Practice Session PS14 Exploring Steps of Transition towards Universal Human Order
Practice Sessions for UNIT I – Introduction to Value Education
PS1 Sharing about Oneself
PS2 Exploring Human Consciousness
PS3 Exploring Natural Acceptance
Practice Sessions for UNIT II – Harmony in the Human Being
PS4 Exploring the difference of Needs of self and body
PS5 Exploring Sources of Imagination in the self
PS6 Exploring Harmony of self with the body
Practice Sessions for UNIT III – Harmony in the Family and Society
PS7 Exploring the Feeling of Trust
PS8 Exploring the Feeling of Respect
PS9 Exploring Systems to fulfil Human Goal
Practice Sessions for UNIT IV – Harmony in the Nature (Existence)
PS10 Exploring the Four Orders of Nature
PS11 Exploring Co-existence in Existence
Practice Sessions for UNIT V – Implications of the Holistic Understanding – a Look at Professional Ethics
PS12 Exploring Ethical Human Conduct
PS13 Exploring Humanistic Models in Education
PS14 Exploring Steps of Transition towards Universal Human Order
READINGS:
Textbook and Teachers Manual
a. The Textbook
R R Gaur, R Asthana, G P Bagaria, A Foundation Course in Human Values and Professional Ethics, 2nd Revised Edition, Excel Books, New Delhi, 2019. ISBN 978-93-87034-47-1
b. The Teacher's Manual
R R Gaur, R Asthana, G P Bagaria,Teachers' Manual for A Foundation Course in Human Values and Professional Ethics, 2nd Revised Edition, Excel Books, New Delhi, 2019. ISBN 978-93-87034-53-2
Reference Books
1. JeevanVidya: EkParichaya, A Nagaraj, JeevanVidyaPrakashan, Amarkantak, 1999.
2. Human Values, A.N. Tripathi, New Age Intl. Publishers, New Delhi, 2004.

3. The Story of Stuff (Book).
4. The Story of My Experiments with Truth - by Mohandas Karamchand Gandhi
5. Small is Beautiful - E. F Schumacher.
6. Slow is Beautiful - Cecile Andrews
7. Economy of Permanence - J C Kumarappa
8. Bharat Mein Angreji Raj – PanditSunderlal
9. Rediscovering India - by Dharampal
10. Hind Swaraj or Indian Home Rule - by Mohandas K. Gandhi
11. India Wins Freedom - Maulana Abdul Kalam Azad
12. Vivekananda - Romain Rolland (English)
13. Gandhi - Romain Rolland (English)

Mode of Conduct:

Lecture hours are to be used for interactive discussion, placing the proposals about the topics at hand and motivating students to reflect, explore and verify them.

Tutorial hours are to be used for practice sessions.

While analyzing and discussing the topic, the faculty mentor's role is in pointing to essential elements to help in sorting them out from the surface elements. In other words, help the students explore the important or critical elements.

In the discussions, particularly during practice sessions (tutorials), the mentor encourages the student to connect with one's own self and do self-observation, self-reflection and selfexploration.

Scenarios may be used to initiate discussion. The student is encouraged to take up "ordinary" situations rather than" extra-ordinary" situations. Such observations and their analyses are shared and discussed with other students and faculty mentor, in a group sitting.

Tutorials (experiments or practical) are important for the course. The difference is that the laboratory is everyday life, and practical are how you behave and work in real life.

Depending on the nature of topics, worksheets, home assignment and/or activity are included.

The practice sessions (tutorials) would also provide support to a student in performing actions commensurate to his/her beliefs. It is intended that this would lead to development of commitment, namely behaving and working based on basic human values.

It is recommended that this content be placed before the student as it is, in the form of a basic foundation course, without including anything else or excluding any part of this content.

Additional content may be offered in separate, higher courses. This course is to be taught by faculty from every teaching department, not exclusively by any one department.

Teacher preparation with a minimum exposure to at least one 8-day Faculty Development Program on Universal Human Values is deemed essential.

Online Resources:

1. https://fdp-si.aicte-india.org/UHVII%20Class%20Notes%20&%20Handouts/UHV%20Handout%201-Introduction%20to%20Value%20Education.pdf
2. https://fdp-si.aicte-india.org/UHVII%20Class%20Notes%20&%20Handouts/UHV%20Handout%202-Harmony%20in%20the%20Human%20Being.pdf
3. https://fdp-si.aicte-india.org/UHVII%20Class%20Notes%20&%20Handouts/UHV%20Handout%203-Harmony%20in%20the%20Family.pdf
4. https://fdp-si.aicte-india.org/UHV%201%20Teaching%20Material/D3-S2%20Respect%20July%2023.pdf
5. https://fdp-si.aicte-india.org/UHVII%20Class%20Notes%20&%20Handouts/UHV%20Handout%205-
6. https://fdp-si.aicte-india.org/download/FDPTeachingMaterial/3-days%20FDPSI%20UHV%20Teaching%20Material/Day%203%20Handouts/UHV%203D%20D3-S2A%20Und%20Nature-Existence.pdf
7. https://fdp-si.aicteindia.org/UHV%20II%20Teaching%20Material/UHV%20II%20Lecture%2023-25%20Ethics%20v1.pdf
8. https://www.studocu.com/in/document/kiet-group-of-institutions/universal-humanvalues/chapter-5-holistic-understanding-of-harmony-on-professional-ethics/62490385
9. https://onlinecourses.swayam2.ac.in/aic22_ge23/preview Harmony%20in%20the%20Nature%20and%20Existence.pdf

Signature of External Member 1

Signature of External Member 2

Signature Industry Expert

Signature BoS Chairman

Signature Of University Nominee

UNIT II: Linear Programming:
Standard form of a linear programming problem, geometry of linear programming problems, Definitions and theorems, solution of a system of linear simultaneous equations, pivotal Reduction of a general system of equations, motivation to the simplex method, simplex Algorithm.

UNIT III: Transportation Problem::
Finding initial basic feasible solution by north – west corner rule, least cost method and Vogel's approximation method, testing for optimality of balanced transportation problems, Special cases in transportation problem.

UNIT IV: Nonlinear Programming:
Unconstrained cases, One – dimensional minimization methods: Classification, Fibonacci method, Univariate method, steepest descent method. Constrained cases– Characteristics of a constrained problem, Classification, Basic approach of PenaltyFunction method, Basic approaches of Interior and Exterior penalty function methods,

UNIT V: Dynamic Programming:
Dynamic programming multistage decision processes, types, concept of sub optimization and the Principle of optimality, computational procedure in dynamic programming, examples illustrating the Calculus method of solution, examples illustrating the tabular method of solution.

.Textbooks:

1. "Engineering optimization: Theory and practice", S. S.Rao, New Age International (P) Limited, 3rd edition, 1998.
2. "Introductory Operations Research", H.S. Kasene& K.D. Kumar, Springer (India), Pvt.LTd.

Reference Books:

1. "Optimization Methods in Operations Research and systems Analysis", by K.V. Mital and C. Mohan, New Age International (P) Limited, Publishers, 3rd edition, 1996.
2. Operations Research, Dr.S.D.Sharma, Kedarnath, Ramnath& Co.

Signature of External Member 1

Signature of External Member 2

Signature Industry Expert

Signature BoS Chairman

Signature Of University Nominee

MALINENI LAKSHMAIAH
WOMEN'S ENGINEERING COLLEGE
(AUTONOMOUS)

(Accredited by "NBA" & NACC A+ Grade | Approved by AICTE, New Delhi & Affiliated to JNTUK, Kakinada)

Pulladigunta (Vil), Vatticherukuru (Md), Prathipadu Road, Guntur – 522 017 A.P.

CS (DS)(R23-COURSE STRUCTURE & SYLLABUS)

II Year-II Semester

L	T	P	C
3	0	0	3

OPTIMIZATION TECHNIQUES

Pre-requisite:

Course Objectives:

1. To define an objective function and constraint functions in terms of design variables, and then state the optimization problem.
2. To state single variable and multi variable optimization problems, without and with Constraints.
3. To explain linear programming technique to an optimization problem, define slack and surplus variables, by using Simplex method.
4. To state transportation and assignment problem as a linear programming problem to Determine Simplex method.
5. To study and explain nonlinear programming techniques, unconstrained or constrained, and define exterior and interior penalty functions for optimization problems

Course Outcomes: At the end of the course, student will be able to

- State and formulate the optimization problem, without and with constraints, by using design variables from an engineering design problem.
- Apply classical optimization techniques to minimize or maximize a multi-variable objective function, without or with constraints, and arrive at an optimal solution.
- Apply and Solve transportation and assignment problem by using Linear Programming Simplex method.
- Apply gradient and non-gradient methods to nonlinear optimization problems and use Interior or exterior penalty functions for the constraints to derive the optimal solutions
- Formulate and apply Dynamic programming technique to inventory control, Production planning, engineering design problems etc. to reach a final optimal Solution from the current optimal solution.

UNIT I: Introduction and Classical Optimization Techniques:

Statement of an Optimization problem, design vector, design constraints, constraint surface, Objective function, objective function surfaces, classification of Optimization problems Classical Optimization Techniques: Single variable Optimization, multi variable Optimization without constraints, necessary and sufficient conditions for Minimum/maximum, multivariable Optimization with equality constraints. Solution by Method of Lagrange multipliers, multivariable Optimization with inequality constraints, Kuhn – Tucker conditions

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ELECTRONICS AND COMMUNICATION ENGINEERING

(R23-COURSE STRUCTURE & SYLLABUS)

II Year-I Semester

L	T	P	C
2	0	0	2

MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS

Course Objectives:

- To inculcate the basic knowledge of microeconomics and financial accounting
- To make the students learn how demand is estimated for different products, inputoutput relationship for optimizing production and cost
- To Know the Various types of market structure and pricing methods and strategy
- To give an overview on investment appraisal methods to promote the students to learn how to plan long-term investment decisions.
- To provide fundamental skills on accounting and to explain the process of preparing financial statements.

Course Outcomes:

- Define the concepts related to Managerial Economics, financial accounting and management(L2)
- Understand the fundamentals of Economics viz., Demand, Production, cost, revenue and markets (L2)
- Apply the Concept of Production cost and revenues for effective Business decision (L3)
- Analyze how to invest their capital and maximize returns (L4)
- Evaluate the capital budgeting techniques. (L5)
- Develop the accounting statements and evaluate the financial performance of business entity (L5)

UNIT - I Managerial Economics

Introduction – Nature, meaning, significance, functions, and advantages. Demand-Concept, Function, Law of Demand - Demand Elasticity- Types – Measurement. Demand Forecasting-Factors governing Forecasting, Methods. Managerial Economics and Financial Accounting and Management.

UNIT - II Production and Cost Analysis

Introduction – Nature, meaning, significance, functions and advantages. Production Function– Least- cost combination– Short run and long run Production Function- Isoquants and Is costs, Cost & Break-Even Analysis - Cost concepts and Cost behaviour- Break-Even Analysis (BEA) - Determination of Break-Even Point (Simple Problems).

UNIT - III Business Organizations and Markets

Introduction – Forms of Business Organizations- Sole Proprietary - Partnership - Joint Stock Companies - Public Sector Enterprises. Types of Markets - Perfect and Imperfect Competition - Features of Perfect Competition Monopoly- Monopolistic Competition– Oligopoly-Price-Output Determination - Pricing Methods and Strategies

UNIT - IV Capital Budgeting

Introduction – Nature, meaning, significance. Types of Working Capital, Components, Sources of Short-term and Long-term Capital, Estimating Working capital requirements. Capital Budgeting– Features, Proposals, Methods and Evaluation. Projects – Pay Back Method, Accounting Rate of Return (ARR) Net Present Value (NPV) Internal Rate Return (IRR) Method (sample problems)

UNIT - V Financial Accounting and Analysis -

Introduction – Concepts and Conventions- Double-Entry Bookkeeping, Journal, Ledger, Trial Balance- Final Accounts (Trading Account, Profit and Loss Account and Balance Sheet with simple adjustments). Introduction to Financial Analysis - Analysis and Interpretation of Liquidity Ratios, Activity Ratios, and Capital structure Ratios and Profitability.

Textbooks:

1. Varshney & Maheswari: Managerial Economics, Sultan Chand.
2. Aryasri: Business Economics and Financial Analysis, 4/e, MGH.

Reference Books:

1. Ahuja Hl Managerial economics Schand.
2. S.A. Siddiqui and A.S. Siddiqui: Managerial Economics and Financial Analysis, New Age International.
3. Joseph G. Nellis and David Parker: Principles of Business Economics, Pearson, 2/e, New Delhi.
4. Domnick Salvatore: Managerial Economics in a Global Economy, Cengage.

Online Learning Resources:

https://www.slideshare.net/123ps/managerial-economics-ppt
https://www.slideshare.net/rossanz/production-and-cost-45827016
https://www.slideshare.net/darkyla/business-organizations-19917607
https://www.slideshare.net/balarajbl/market-and-classification-of-market
https://www.slideshare.net/ruchi101/capital-budgeting-ppt-59565396
https://www.slideshare.net/ashu1983/financial-accounting

Signature of External Member 1

Signature of External Member 2

Signature Industry Expert

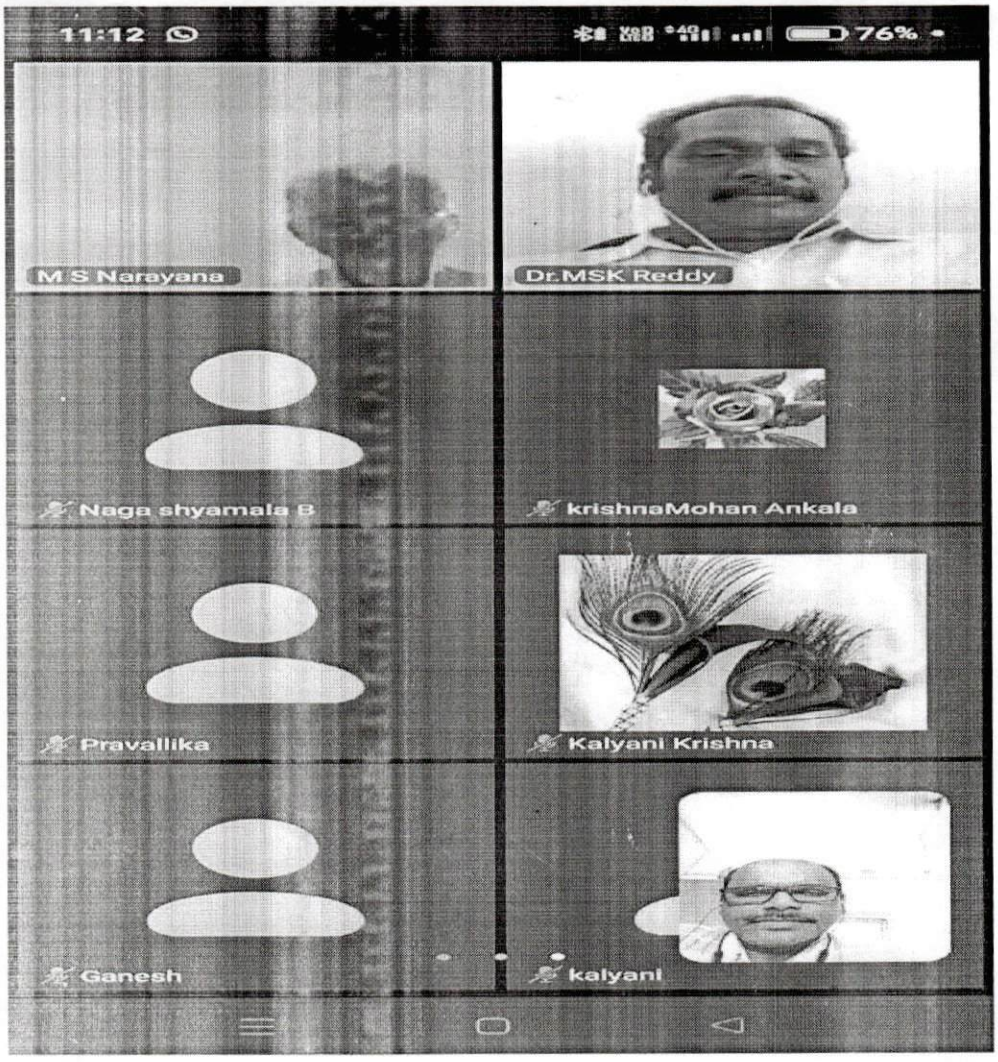
Signature BoS Chairman

Signature Of University Nominee

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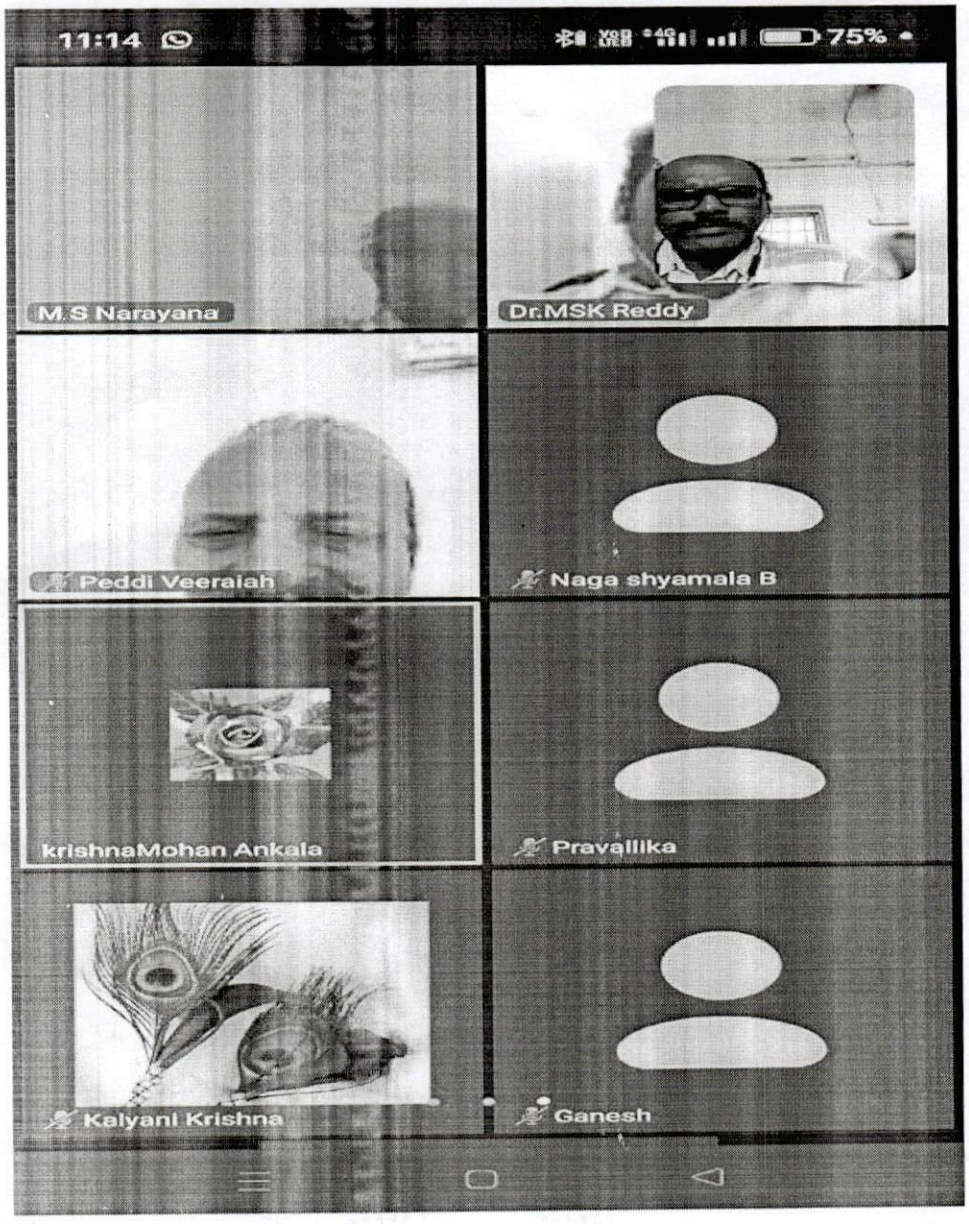
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ELECTRONICS AND COMMUNICATION ENGINEERING
(R23-COURSE STRUCTURE & SYLLABUS)

II Year-II Semester

L	T	P	C
0	1	2	2

SOFT SKILLS

Course Objectives:

- To prepare to face global competition for employment and excellence in profession.
- To help the students understand and build interpersonal and interpersonal skills that will enable them to lead meaningful professional life..

UNIT – 1: INTRODUCTION

Introduction- Emergence of life skills, Definition & Meaning, Importance& need, reasons for skill gap, Analysis--Soft Skills vs Hard skills, Linkage between industry and soft skills, Challenges, Personality Developments. Soft Skills, Soft Skills vs. English - Improving Techniques..

UNIT – II: Intra-Personal:

Definition-Meaning – Importance-SWOT analysis, Johari windows - Goal Setting- quotient skills - Emotional Intelligence- Attitudinal skills - Right thinking- Problem Solving-Time Management, stress management.

UNIT – III: Inter-Personal:

Definition – Meaning – Importance-Communications skills- Team Work, managerial skills -Negotiation skills- Leadership skills, corporate etiquettes.

UNIT – IV: Verbal Skills:

Definition and Meaning-Listening skills, need- types, advantages, Importance-Improving Tips for Listening, Speaking, need- types, advantages, Importance- Improving Tips, Reading- Writing Skills, Report, Resume, statement of purpose, need- types, advantages, Importance-Improving Tips.

UNIT – V: Non Verbal Skills& Interview skills

Definition and Meaning – Importance- Facial Expressions- Eye Contact – Proxemics-Haptics -Posture, cross cultural body language, body language
in interview room, appearance and dress code – Kinetics- Para Language - tone, pitch, pause, neutralization of accent, use of appropriate language, Interview skills, interview methods and questions..

Text Books:

1) Sherfield, M. Robert at al, Cornerstone Developing Soft Skills, 4/e, Pearson Publication, New Delhi, 2014.
2) Alka Wadkar, Life Skills for Success, 1/e, Sage Publications India Private Limited, 2016.

Reference Books:

1. Sambaiah.M. Technical English, Wiley publishers India. New Delhi. 2014.
2. Gangadhar Joshi, From Campus to Corporate, SAGE TEXT.
3. Alex.K, Soft Skills, 3rd ed. S. Chand Publication, New Delhi, 2014.
4. Meenakshi Raman and Sangita Sharma, Technical Communication: Principle and Practice, Oxford University Press, 2009.
5. Shalini Varma, Body Language for Your Success Mantra, 4/e, S. Chand Publication, New Delhi, 2014.
6. Stephen Covey, Seven Habits of Highly Effective People, JMD Book, 2013.

Online Learning Resources:

- https://onlinecourses.nptel.ac.in/noc20_hs60/preview
- http://www.youtube.com/@softskillsdevelopment6210
- https://youtube.com/playlist?list=PLLy_2iUCG87CQhELCytvXh0E_ybOO1_q&si=Fs05Xh8ZrOPsR8F4
- https://www.coursera.org/learn/people-soft-skills-assessment?language=English
- https://www.edx.org/learn/soft-

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Minutes of Board of Studies Meeting

Date: 08/09/2024

The first External Board of Studies Meeting of the Department of MBA was held online on 08.09.2024 at3:00PM in Zoom platform to finalize the syllabus for MBA I & II Semesters under R-24 regulations.

The following members were present:

S.No.	Name of the BoS Member	Designation	Attendance	Signature
1	Mr P.KALYANA CHAKRAVARTHI	Chairman, Assoc Prof & HoD MBA	PRESENT	
2	DR A.Krishna Mohan	University Nominee and External BoS Member	PRESENT	
3	Dr.M.S.Narayana	Subject Expert and External BoS Member	PRESENT	
4	DrM.Siva Koti Reddy	Subject Expert and External BoS Member	PRESENT	
5	Mr P.Veeraiah	Assoc Prof, Member	PRESENT	
6	Mr G.Baji	Asst Prof, Member	PRESENT	
7	Mrs B.NagaSayamala	Asst Prof, Member	PRESENT	
8	Ms P.Kalyani	Asst Prof, Member	PRESENT	
9	Mrs. J. Pravallika	Asst Prof, Member	PRESENT	
10	Mr.M.S.S Ganesh	Industry Expert and External BoS Member	PRESENT	
11	Mrs M.Bindu Priya	Member, Alumnus	ABSENT	

At the onset of the meeting, the Chairman of BoS, Assoc Prof P.Kalyan Chakravarthi, welcomed all the members and introduced members to the External Subject Experts. The meeting began with the presentation of curriculum by the chair for semesters I-I, I-II for P.G MBA. He then presented the syllabus of all subjects of I-I & I-II semesters under R-24 regulations followed by presentation of syllabus of all subjects under R-24 regulations for approval, prepared by the internal BOS members.

Resolutions in Meeting

Agenda: To discuss and finalize the syllabus of the proposed P.G MBA I-I & I-II Semester courses of R-24 (Autonomous) regulations.

Resolutions: Syllabus of P.G MBA I-I & I-II Semester courses of R-24 regulations is approved by the Board of Studies Committee.

1. Encl: **Syllabus Copies for MBA I-I SEM & I-II SEM subjects.**

General Comments

2. External BoS expert Pro A.Krishna Mohan enquired about internal and external evaluation procedures .Mr.P.Veeraiah explained the norms being followed at MLEW.
3. External BoS expert Dr.M.S. Narayana has asked to include year of publication and edition for the recommended text books in each subject.
4. External BoS expert Dr M.Siva Koti Reddy Suggested that students have to participate various Management activities to get more exposure regarding Industrial requirements and also to get real time experience.
5. The external BoS members expressed their satisfaction towards the contents for each subject prepared by the internal BoS members.
6. Chairman Mr P.Kalyan Chakravarthi informed the BoS members that the syllabus of core subjects is going to follow as per University Syllabus for PG MBA I/I & I/II subjects.

Curriculum related Comments

Comments by Subject Expert and External BoS Member Prof A.Krishna Mohan:

1. Advised to conduct more activities and Intership for students exposure.
2. Suggested to conduct Webinars/Seminars for Students.
3. Suggested to do Online courses to acquire more Knowledge in their Subjects

Comments by Subject Expert and External BoS Member Dr.M.S. Narayana:

1. Opined to specify respective streams for Professional Electives mentioned in the curriculum.
2. Suggested to send students to More Industrial Visits.

Comments by Industry Expert and External BoS Member Mr.M.S.S.Ganesh:

1. Mr.M.S.S Ganesh suggested that Students has to learn some additional Courses mandatory Like SAP,HCM, etc in view of the importance of this course in Placements.
2. Mr.M.S.S Ganesh also suggested that Students has to Improve Communication Skills and Soft Skills.

According to the comments made by the Subject Experts and Industry Expert, the Chairman Mr P.Kalyan Chakravarthi decided to implement the following

1. To Conduct More activity oriented Sessions to Improve students Creative Skills and Innovative thinking.
2. To conduct more Internship Programs, to get Industrial Exposure.
3. To conduct Guest Lectures with Industrial Experts to know about opportunities in various sectors and their requirements.
4. As subject codes will be assigned by the Examination Cell, the Chairman decided to follow those subject codes in the course structure, as decided by the exam cell as per autonomous regulations.
5. Domain names shall be included for each pool of Professional Electives.
6. Students have to participate in Internships programs to get exposure for MBA students.
7. As per R-24 regulation JNTUK Kakinada curriculum & Course structure for P.G First Year (I & II) Semester Subjects has been approved without any Changes in this BoS meeting.
8. As per the recommendations, guidelines from the university nominee Dr. A. Krishna Mohan given detailed explanation about R-24 regulations in the BoS meeting, so we are following the same regulation, course structure & syllabus for MBA I year. These has been approved in BoS Meeting.

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Sl.No	Course	Year	Sem	Name of the Subject	Branch
01	MBA	I	I & II	All Subjects	MBA

Signature of External Member 1

Signature of External Member 2

Signature Industry Expert

Signature of University Nominee

(Mr. P.KALYANA CHAKRAVARTHI)

Chairman, BoS

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I Year II Semester

S.No	Course Code	Courses	M	L	T	P	C
1	C-201	Financial Management	100	4	0	0	4
2	C-202	Human Resource Management	100	4	0	0	4
3	C-203	Operations Management	100	4	0	0	4
4	C-204	Marketing Management	100	4	0	0	4
5	C-205	Research Methods for Business Decisions	100	4	0	0	4
6	C-206	Business Analytics	100	4	0	0	4
7	OE-201	A. Cross Cultural management B. Project Management C. Lean Management D. Database Management System	100	3	0	0	3
8	SE-201	R-Programming Lab	30	0	0	2	1
9	SE-202	IT Lab (Spread sheets and SQL)	30	0	0	2	1
10	VA-201	Entrepreneur Project –II Study on different loan approaches of State and Central Govt. Prepare the Business Development plan.	30	0	0	1	1
		Total	**790**	**27**	**0**	**5**	**30**

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Signature of External Member 2

Signature Industry Expert

Signature BoS, Chairman

Signature of University Nominee

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IYear I Semester

S.No	Course Code	Courses	M	L	T	P	C
1	C-101	Management and OrganizationalBehavior	100	4	0	0	4
2	C-102	Managerial Economics	100	4	0	0	4
3	C-103	Accounting for Management	100	4	0	0	4
4	C-104	Quantitative Analysis for BusinessDecisions	100	4	0	0	4
5	C-105	Entrepreneurship Development	100	4	0	0	4
6	C-106	Business Environment	100	4	0	0	4
7	OE-101	A. Information Technology forBusiness B. Rural Development C. IPR & Patents D. MOOCs : SWAYAM/NPTEL- (Related to Management Coursesother than listed courses in the syllabus)	100	3	0	0	3
8	SE-101	PACE-UP(Personality Assessment Centre, Enhancement and Upgradation Processes) Programme	30	0	0	2	1
9	SE-102	Tally Lab	30	0	0	2	1
10	VA-101	Entrepreneur Project -I Identifying the area of interest, interacting with successful business and submission of ground report.	30	0	0	2	1
		Total	**790**	**27**	**0**	**6**	**30**

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Signature of External Member 2

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Signature Bos, Chairman

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I-SEMESTER

S. no	Course Code	SUBJECT TITLE
1	C-101	Management and OrganizationalBehavior
2	C-102	Managerial Economics
3	C-103	Accounting for Management
4	C-104	Quantitative Analysis for BusinessDecisions
5	C-105	Entrepreneurship Development
6	C-106	Business Environment
7	OE-101	Rural Development

II-SEMESTER

S. no	Course Code	SUBJECT TITLE
1	C-201	Financial Management
2	C-202	Human Resource Management
3	C-203	Operations Management
4	C-204	Marketing Management
5	C-205	Research Methods for Business Decisions
6	C-206	Business Analytics
7	OE-201	Database Management System

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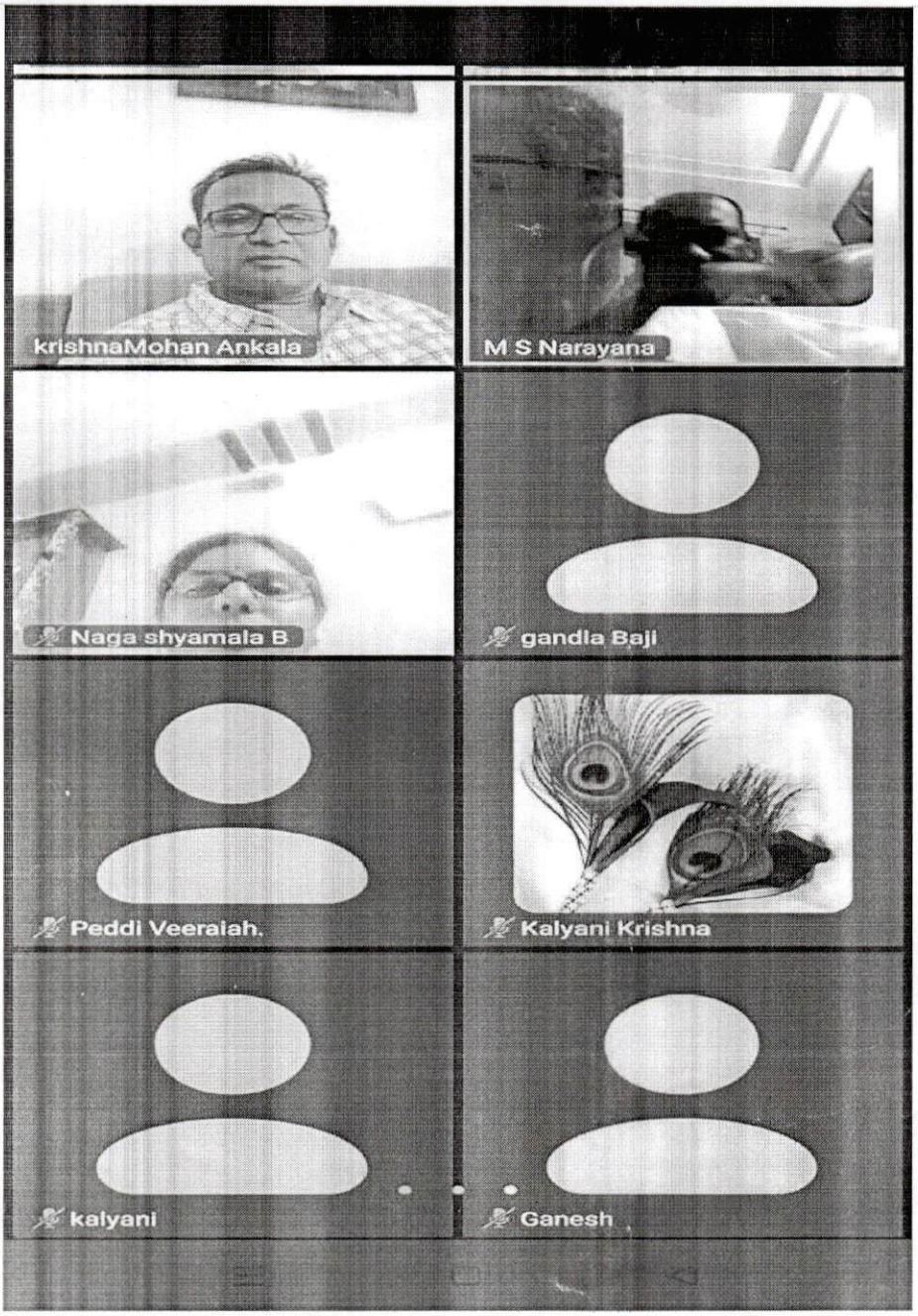
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ENTREPRENEUR PROJECT

Entrepreneur Project –II
Study on different loan approaches of State and Central Govt. Prepare the Business Development plan

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IT LAB (SPREAD SHEETS AND SQL)

UNIT- 1

Introduction to Information Technology, Classification of Software - Basics of MS Word and Basics of MS PowerPoint.

UNIT –II

The MS Excel interface, Formatting Cells, Data Entry- Inserting, Deleting, Selecting, Copying, Cutting, and Pasting. Methods of applying Formulas. Basic calculations.

UNIT- III

Conditional Formatting, Cell References & addressing, Conditional functions, IF functions, - Look up functions, Sorting & Filtering Data.

UNIT- IV

Demonstrating Statistical Functions and Financial functions in excel,
Different types of Charts preparation and representation.

UNIT- V

Introduction to SQL – SQL commands, Data types, Creating Tables. SQL constraints. Functional queries.

Reference:

1) Excel: Quick Start Guide from Beginner to Expert (Excel, Microsoft Office)- by William Fischer
2) Peeking into computer science- Excel Lab Manual- Jalal Kawash
3) SQL Tutorial (w3schools.com)

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Probability- Cumulative Sums and Products-Minima and Maxima- Calculus, Functions Fir Statistical Distribution, Sorting, Linear Algebra Operation on Vectors and Matrices,

Extended Example: Vector cross Product- Extended Example: Finding Stationary Distribution of Markov Chains, Set Operation, Input /out put, Accessing the Keyboard and Monitor, Reading and writer Files,

UNIT-IV:

All the theory content here below shall be executed with examples.

Graphics, Creating Graphs, The Workhorse of R Base Graphics, the plot() Function – Customizing Graphs, Saving Graphs to Files.

UNIT-V:

All the theory content here below shall be executed with examples.

Probability Distributions, Normal Distribution- Binomial Distribution- Poisson Distributions Other Distribution, Basic Statistics, Correlation and Covariance, T-Tests,-ANOVA.

REFERENCE BOOKS:

1) The Art of R Programming, Norman Matloff, Cengage Learning
2) R for Everyone, Lander, Pearson
3) R Cookbook, PaulTeetor, Oreilly
4) R Programming By Dr.T. Murali Mohan , S.Chand Publications.
5) Garrett Grolemund, Hands on Programming with R, Oreilly

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R-PROGRAMMING LAB

OBJECTIVE:

After taking the course, students will be able to

- Use R for statistical programming, computation, graphics, and modeling,
- Write functions and use R in an efficient way,
- Fit some basic types of statistical models
- Use R in their own research,
- Be able to expand their knowledge of R on their own.

OUTCOMES:

At the end of this course, students will be able to:

- List motivation for learning a programming language
- Access online resources for R and import new function packages into the R workspace
- Import, review, manipulate and summarize data-sets in R
- Explore data-sets to create testable hypotheses and identify appropriate statistical tests
- Perform appropriate statistical tests using R Create and edit visualizations with

SYLLABUS:

UNIT-I:

All the theory content here below shall be executed with examples.

Introduction, How to run R, R Sessions and Functions, Basic Math, Variables, Data Types, Vectors, Conclusion, Advanced Data Structures, Data Frames, Lists, Matrices, Arrays, Classes.

UNIT-II:

All the theory content here below shall be executed with examples.

R Programming Structures, Control Statements, Loops, - Looping Over Non vector Sets,- If-Else, Arithmetic and Boolean Operators and values, Default Values for Argument, Return Values, Deciding Whether to explicitly call return- Returning Complex Objects, Functions are Objective, No Pointers in R, Recursion, A Quicksort Implementation-Extended Extended Example: A Binary Search Tree.

UNIT-III:

All the theory content here below shall be executed with examples.

Doing Math and Simulation in R, Math Function, Extended Example Calculating

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4. Raghu Ramakrishnan, —Database Management Systems¦, Fourth Edition, McGraw Hill,

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I Year II Semester

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DATA BASE MANAGEMENT SYSTEM

Objective:

The course is to present an introduction to database management systems, with an emphasis on how to organize, maintain and retrieve - efficiently, and effectively - information from a DBMS.

UNIT I

Introduction to Database Systems: Data - Database Applications - Evolution of Database - Need for Database Management – Data models - Database Architecture - Key Issues and Challenges in Database Systems.

UNIT II

ER and Relational Models: ER Models – ER to Relational Mapping –Object Relational Mapping - Relational Model Constraints - Keys - Dependencies - Relational Algebra - Normalization - First, Second, Third & Fourth Normal Forms - BCNF – Join Dependencies.

UNIT III

Data Definition and Querying: Basic DDL - Introduction to SQL - Data Constraints - Advanced SQL - Views - Triggers - Database Security – Embedded & Dynamic SQL.

UNIT IV

Transactions and Concurrency: Introduction to Transactions - Transaction Systems - ACID Properties - System & Media Recovery - Need for Concurrency - Locking Protocols – SQL for Concurrency – Log Based Recovery - Two Phase Commit Protocol - Recovery with SQL-Deadlocks & Managing Deadlocks.

UNIT V

Advanced Topics in Databases: Indexing & Hashing Techniques - Query Processing & Optimization - Sorting & Joins – Database Tuning - Introduction to Special Topics - Spatial & Temporal Databases – Data Mining and Warehousing.

Relevant cases have to be discussed in each unit and in examination case is compulsory from any unit.

REFERENCES:

1. Abraham Silberschatz, Henry F. Korth, S. Sudharshan, —Database System Concepts¦, Sixth Edition, Tata McGraw Hill, 2010.
2. Ramez Elmasri, Shamkant B. Navathe, —Fundamentals of Database Systems¦, Sixth Edition, Pearson/Addison - Wesley, 2010.
3. C.J. Date, A. Kannan and S. Swamynathan, —An Introduction to Database Systems¦, Pearson Education, Eighth Edition, 2006.

3. James Evans, Business Analytics, 2e, Pearson, 2017.
4. Camm, Cochran, Fry, Ohlmann, Anderson, Sweeney, Williams Essential of Business Analytics, Cengage Learning, 2020.
5. Thomas Eri, Wajid Khattack & Paul Buhler: Big Data Fundamentals, Concepts, drVers and Techniques by Prentice Hall of India, New Delhi, 2015.
6. Akil Maheswari, Big Data, Upskill ahead by Tata McGraw Hill, New Delhi, 2016.

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I Year II Semester

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BUSINESS ANALYTICS

Course Objectives:

- To understand the importance, difference and practices of analytics in business.
- Understand business communication through data-driven information,
- Apply knowledge and explain natural processes by relating them to a certain distribution of data
- To understand the data visualization tools, application and statistical methods.
- To learn the measure of variability in decision making
- Evaluate and compare descriptive and predictive analytics with use case scenarios.

Unit I

Introduction to Data Analytics: Introduction to Data analytics - Role of Data in Organization, Data lifecycle. (Data source, data changes, processes, usage) -Various Data Types - Significance of Analytics- Role of Data Analyst - Difference between Data analytics and Business Analytics – real-world data analytics examples.

Unit II

Tools & Techniques: Typical Data Analysis Process - Data analytics techniques: Regression analysis, Factor analysis, Cohort analysis, Cluster analysis-Time-series analysis. Data analytics tools -Microsoft Excel, Tableau, SAS, RapidMiner, Power BI.

Unit III Concepts of data cleaning - Data Visualization: Over view of Data visualization – Data Visualization tools, Statistical methods for summarizing data – How to create pivotal tables using excel - Exploring data using pivot table –Cross Tabulation _ Creating Charts:- 1.Scatter charts, 2.Line charts, 3. Bar charts and column, 4. Pie Charts and 3-D charts, 4. Bubble charts, - Effective use of Dashboards, Power BI and Tableau.

Unit IV Descriptive Analytics: Concept of Descriptive A_3n_5alytics –Measures of central Tendency –Measuring and calculation of Arithmetic Mean, Mode, Median - Calculation of application of Weighted Arithmetic Mean, Geometric and Harmonic mean using MS Excel-Measures of Variability-Range, Variance, Standard Deviation, Coefficient of Variation using MS Excel

Unit V Predictive Analytics: Karl Pearson Correlation Techniques - Spearman's Rank correlation -Simple and Multiple regression -Regression by the method of least squares – Building good regression models – Regression with categorical independent variables.

Suggested Readings:

1. R for Data Science: Import, Tidy, Transform, Visualize, and Model Data,Hadley Wickham & Garrett Grolemund.O'REILLY.
2. Mohiuddin Ahmed, Al-Sakib Khan Pathan, Data Analytics: Concepts, Techniques, and Applications, Taylor & Francis Group, 2020

Editing – Coding – Classification of Data – Tables and Graphic Presentation –Preparation and Presentation of Research Report.

UNIT 4

Statistical Inference: Formulation of Hypothesis –Tests of Hypothesis - Introduction to Null hypothesis vs. alternative hypothesis, parametric vs. non-parametric tests, procedure for testing of hypothesis, tests of significance for small samples, application, t-test, Chi Square test.

UNIT 5

Multivariate Analysis: Nature of multivariate analysis, classifying multivariate techniques, analysis of dependence, analysis of interdependence. Bi-Variate analysis-tests of differences-t test for comparing two means and z-test for comparing two proportions and ANOVA for complex experimental designs.

Relevant cases have to be discussed in each unit and in examination case is compulsory from any unit.

References

1. C.R. Kothari: Research Methodology, methods and Techniques New Age International Publisher.
2. Navdeep and Guptha : "**Statistical Techniques & Research Methodology**", Kalyani Publishers
3. Willam G.Zikmund, Adhkari: "***Business Research Methods***", Cengage Learning, New Delhi, 2013.
4. A.N. Sadhu, Amarjit singh, Research methodology in social sciences, 7th Edition Himalaya Publications.
5. A Bhujanga rao , Research methodology, Excel Books3,42008.

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I Year II Semester

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RESEARCH METHODS FOR BUSINESS DECISIONS

Course Objective:

To develop understanding of the basic framework of research process. Developing the students in Research orientation and to acquaint them with fundamental of research methods

To identify various sources of information for literature review and data collection

To understand the data analysis and presentation

To understand various statistical tools and their applicability in research.

To enable them to write a research report and thesis.

Course Outcomes:

1 Understand advanced design, methodologies and analysis in business research methods, including key terms, classifications and systematic applications to the research data and design of a research project

2 Apply knowledge in collecting data from various sources.

3 Demonstrate knowledge in data analysis and interpretation.

4 Applying appropriate statistical techniques in the analysis of data

5 Demonstrate the abilities in preparing research reports.

UNIT 1

Introduction : Nature and Importance of Research, The role of Business Research, Aims of social research, Types of Research- Pure research vs. Applied research, Qualitative research vs. Quantitative research, Exploratory research, Descriptive research and Experimental research, ethical issues in business research-Defining Researc$_3$h$_3$ Problem, Steps in Research process.

UNIT 2

Data Base: Discussion on primary data and secondary data, tools and techniques of collecting data. Methods of collecting data. Sampling design and sampling procedures. Random vs. Non-random sampling techniques, determination of sample size and an appropriate sampling design. Designing of Questionnaire –Measurement and Scaling – Nominal Scale – Ordinal Scale – Interval Scale – Ratio Scale – Guttmann Scale – Likert Scale – Schematic Differential Scale.

UNIT 3

Survey Research and data analysis: Selection of an appropriate survey research design, the nature of field work and Field work management. Media used to communicate with Respondents, Personal Interviews, Telephone interviews, Self-administered Questionnaires-

Relevant cases have to be discussed in each unit and in examination case is compulsory from any unit.

References

1. Phillip Kotler: "**Marketing Management** ", Pearson Publishers, New Delhi, 2013.
2. Rajan Saxena: "**Marketing Management**", Tata McGraw Hill, New Delhi, 2012.
3. V S Ramaswamy & S Namakumari, Marketing Management Global Perspective Indian Context 4th Edition, Mac Millan Publishers 2009.
4. Tapan K Panda: "**Marketing Management**", Excel Books, New Delhi, 2012
5. Paul Baines, Chris Fill, Kelly Page Adapted by Sinha K: "**Marketing**", Oxford University Press, Chennai, 2013

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MARKETING MANAGEMENT

Objectives:

The Course is designed for the students to understand the Marketing concepts and to identify, enrich and fulfill the needs of customers and markets.

UNIT 1

Introduction to Marketing: Needs - Wants – Demands - Products - Exchange - Transactions - Concept of Market and Marketing and Marketing Mix - Production Concept- Product Concept - Sales and Marketing Concept - Societal Marketing Concept - Green Marketing concept - Indian Marketing Environment.

UNIT 2

Market Segmentation, Targeting and Positioning: Identification of Market Segments - Consumer and Institutional/corporate Clientele - Segmenting Consumer Markets - Segmentation Basis – Evaluation and Selection of Target Markets – Positioning significance - Developing and Communicating a Positioning Strategy.

UNIT 3

Product and Pricing Aspects: Product – Product Mix - Product Life cycle -Obsolescence- Pricing- Objectives of Pricing - Methods of Pricing - Selecting the Final price - Adopting price - Initiating the price cuts - Imitating price increases-Responding to Competitor's price changes.

UNIT 4

Marketing Communication: Communication Process – Communication Mix – Integrated Marketing Communication - Managing Advertising Sales Promotion - Public relations and Direct Marketing - Sales force – Determining the Sales Force Size - Sales force Compensation.

UNIT 5

Distribution, Marketing Organization and Control: Channels of Distribution-Intensive, Selective and Exclusive Distribution- Organizing the Marketing Department - Marketing Implementation - Control of Marketing Performance - Annual Plan Control - Profitability Control - Efficiency Control - Strategic Control.

5. K Aswathappa & Sridhar Bhatt, Production & Operations Management, Himalaya,

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OPERATIONS MANAGEMENT

Objectives:

This Course is designed to make student understand the strategic significance of Operation management, to acquaint them with application of discipline to deal with real life business problem.

UNIT I:

Introduction to Operation Management: Nature & Scope of Operation/ Production Management, Relationship with other functional areas, Recent trend in Operation Management, Manufacturing & Theory of Constraint, Types of Production System, Just in Time (JIT) & lean system.

UNIT II:

Product Design & Process Selection: Stages in Product Design process, Value Analysis, Facility location & Layout: Types, Characteristics, Advantages and Disadvantages, Work measurement, Job design.

UNIT III:

Forecasting & Capacity Planning: Methods of Forecasting, Overview of Operation Planning, Aggregate Production Planning, Production strategies, Capacity Requirement Planning, MRP, Scheduling, Supply Chain Management, Purchase Management, Inventory Management.

Unit- IV:

Productivity: Factors, Affecting Productivity – Job Design – Process Flow Charts – Methods Study – Work Measurement – Engineering and Behavioral Approaches.

UNIT V:

Quality Management: Quality- Definition, Dimension, Cost of Quality, Quality Circles-Continuous improvement (Kaizen), ISO (9000&14000 Series), Statistical Quality Control: Variable & Attribute, Process Control, Control Charts -Acceptance Sampling Operating Characteristic Curve (AQL , LTPD, Alpha & Beta risk), Total Quality Management (TQM).

Relevant cases have to be discussed in each unit and in examination case is compulsoryfrom any unit.

References:

1. Krajewski & Ritzman (2004). Operation Management -Strategy and Analysis. Prentice Hall of India.
2. Panner Selvem, Production and Operation Management, Prentice Hall of India.
3. Chunnawals, Production & Operation Management Himalaya, Mumbai
4. Charry, S.N (2005). Production and Operation Management- Concepts, Methods Strategy. John Willy & Sons Asia Pvt Limited.

UNIT -IV

Wage and Salary Administration: Concept- Wage Structure- Wage and Salary Policies- Legal Frame Work- Determinants of Payment of Wages- Wage Differentials - Incentive Payment Systems. Welfare management: Nature and concepts – statutory and non-statutory welfare measures.

UNIT-V

Managing Industrial Relations: Nature- Importance -Trade Unions - Employee Participation Schemes-Collective Bargaining – Grievances and disputes resolution mechanisms – Managing employee safety and health. Relevant cases have to be discussed in each unit and in examination case is compulsory from any unit.

References:

1. K Aswathappa: "Human Resource and Personnel Management", Tata McGraw Hill, New Delhi, 2013.
2. N. Sambasiva Rao and Dr. Nirmal Kumar: "Human Resource Management and Industrial Relations", Himalaya Publishing House, Mumbai.
3. Mathis, Jackson, Tripathy: "Human Resource Management: A south-Asin Perspective", Cengage Learning, New Delhi, 2013.
4. Subba Rao P: "Personnel and Human Resource Management-Text and Cases". Himalaya Publications, Mumbai, 2013.
5. Madhurima Lall, Sakina Qasim Zasidi: "Human Resource Management", Excel Books, New Delhi,2010.

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HUMAN RESOURCE MANAGEMENT

Course Objectives:

1: To acquaint students with a broad perspective on themes and issues of Human Resource Management.
2: To familiarize the student with Investment perspectives of HRM.
3: To familiarize students with the concepts of career development, counseling and gain knowledge about current compensation trends.
4: To gain knowledge about Wage determinants and welfare measures.
5: To familiarize the students with industrial relations concepts , disputes and grievance mechanism , safety in the work places.

Course Outcomes:

At the end of the Course, Student will be able to:

1 : Cite evolution and emerging trends of HRM.
2 : Critically analyze Investment and HRD concepts.
3 : List different appraisal and Compensation system.
4 : Evaluate incentive payment system and welfare measures given to employees.
5 : Interpret industrial relations in organization.

UNIT -I

HRM: Concept, Nature, Scope- and Functions – evolution of HRM- Principles - Ethical Aspects of HRM- HR policies, Strategies to increase firm performance - Role and position of HR department – Strategic HR in changing environment – Emerging trends in HRM.

UNIT -II

Investment perspectives of HRM: HR Planning – Demand and Supply forecasting – Job Analysis-Job Design-Job Evaluation. Recruitment and Selection- Srecruitment – e-recruitment. Steps in Selection Procedures- Tests and

urces ofInterview

Techniques - Induction- Training and Development – Need and Importance-Methods and of Training. Concept of HRD.

UNIT -III

Performance Appraisal: Importance – Methods – Traditional and Modern methods – Latest trends in performance appraisal - Career Development and Counseling- Compensation - Concepts and Principles- Influencing Factors- Current Trends in

Compensation- Methods of Payments in detail - Incentives rewards compensation mechanisms.

References:

1. I.M. Pandey: "**Financial Management",** Vikas Publishers, New Delhi, 2013.
2. Khan and Jain: Financial Management, Tata McGraw Hill, New Delhi,
3. Prasanna Chandra: "**Financial Management Theory and Practice**", Tata McGrawHill 2011.
4. P.Vijaya Kumar, M.Madana Mohan, G. Syamala Rao: "**Financial Management",** Himalaya Publishing House, New Delhi, 2013.
5. Brigham,E.F: "**Financial Management Theory and Practice**", Cengae Learning, New Delhi, 2013
6. RM Srivastava, Financial Management, Himalaya Publishing house, 4th edition.

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I Year II Semester

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FINANCIAL MANAGEMENT

UNIT 1

Financial Management: Concept - Nature and Scope - Evolution of financial Management - The new role in the contemporary scenario – Goals and objectives of financial Management - Firm's mission and objectives - Profit maximization Vs. Wealth maximization – Maximization Vs Satisfying - Major decisions of financial manager.

UNIT 2

Financing Decision: Sources of finance - Concept and financial effects of leverage – EBIT – EPS analysis. Cost of Capital: Weighted Average Cost of Capital– Theories of Capital Structure.

UNIT 3

Investment Decision: Concept and Techniques of Time Value of Money – Nature and Significance of Investment Decision – Estimation of Cash flows – Capital Budgeting Process – Techniques of Investment Appraisal – Discounting and Non Discounting Methods.

UNIT-4

Dividend Decision: Meaning and Significance – Major forms of dividends – Theories of Dividends – Determinants of Dividend – Dividends Policy and Dividend valuation – Bonus Shares –Stock Splits – Dividend policies of Indian Corporate.

UNIT-5

Liquidity Decision: Meaning - Classification and Significance of Working Capital – Components of Working Capital – Factors determining the Working Capital – Estimating Working Capital requirement – Cash Management Models – Accounts Receivables –Credit Policies – Inventory Management.

Relevant cases have to be discussed in each unit and in examination case is compulsory from any unit.

Unit – III

Communication Skills: Understanding Human Communication, Constitutive Processes of Communication, Language as a tool of communication, Barriers to Effective communication, Strategies to Overcome the Barriers.

Emotional intelligence: Importance, concept, theory and measurements.

Stress Management: Strategies for preventing and relieving stress.

Time management: Meaning; Techniques and styles.

Unit – IV

Interview Skills: Interview Skills: in-depth perspectives, Interviewer and Interviewee, Before, During and After the Interview, Tips for Success.

Meeting Etiquette: Managing a Meeting-Meeting agenda, Minute taking,; Duties of the chairperson and secretary; Effective Meeting Strategies - Preparing for the meeting, Conducting the meeting, Evaluating the meeting

Presentation Etiquettes: Importance of Preparation and Practice; Effective Delivery Techniques, Audience Analysis, Handling Stage Fright.

Unit- V

Teamwork and Leadership Skills: Concept of Teams; Building effective teams; Concept of Leadership and honing Leadership skills.

Personality: Meaning & Definition, Determinants of Personality, Personality Traits, Personality and Organisational Behaviour

Motivation: Nature & Importance, Herzberg's Two Factor theory, Maslow's Need Hierarchy theory, Alderfer's ERG theory

Decision-Making and Problem-Solving Skills: Meaning, Types and Models, Group andEthical Decision-Making, Problems and Dilemmas in application of these skills.

Conflict Management: Conflict - Definition, Nature, Types and Causes;Conflict Methods of Resolution.

Human Resource Management: Introduction to HRM, Selection, Orientation ,Training& Development, Performance Appraisal, Incentives

Case Study Analysis

Suggested Readings:

• Barbara Pachter, Marjorie Brody. Complete Business Etiquette Handbook. Prentice Hall, 2015.

I Year I Semester

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PACE UP

(Personality Assessment Centre, Enhancement and Up gradation Processes)

Course Objectives:

Business Etiquettes and Professionalism has been designed to meet the following objectives:

a) To learn the principles of business etiquettes and professional behaviour
b) To understand the etiquettes for making business correspondence effective
c) To be able to present yourself confidently at various business situations
d) Develop awareness of dining and multicultural etiquettes

Learning Outcome:

After completion of course students will be able to:

a) Demonstrate an understanding of professionalism in terms of workplace behaviours and workplace relationships.
b) Adopt attitudes and behaviours consistent with standard workplace expectations.
c) Presenting oneself with finesse and making others comfortable in a business setting.
d) Developing basic life skills or etiquettes in order to succeed in corporate culture.

Unit: 1

Business Etiquettes- An Overview: Significance of Business Etiquettes in 21st Century Professional Advantage; Need and Importance of Professionalism

Workplace Etiquette: Etiquette for Personal Contact- Personal Appearance, Gestures, Postures, Facial Expressions, Eye-contact, Space distancing

E-Mail Etiquette: Significance of Netiquette, E-mail: Way of professional communication,

Basic Email Etiquettes: Proper Grammar, Spelling, Punctuation, Styling and Formatting, Body of Email, Response, Privacy

Unit – II

Telephone Etiquettes: Telephone Communication Techniques -Placing Telephone calls, Answering Calls, Transferring Calls, Putting Calls on Hold, Taking Messages, Handling Rude Callers, Tactful Responses, Leaving Professional Messages; Developing Cell Phone Etiquettes; Voicemail Etiquette; Telephonic Courtesies

Dining Etiquette: Basics of Dining Etiquettes; Basic essentials of dining table etiquettes - Napkin Etiquette, Seating arrangements, laying the table, how to use Cutlery, Posture &Behavior, Do's and Don'ts; International Dining Etiquettes.

Multi-Cultural Challenges: Cultural Differences and their Effects on Business Etiquette

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ENTREPRENEUR PROJECT -1

Entrepreneur Project -I identifying the area of interest, interacting with successful business and submission of ground report

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• Dhanavel, S.P. English and Soft Skills. Hyderabad: Orient BlackSwan, 2021.
• Koneru, Aruna. Professional Communication. Delhi: McGraw, 2008.
• Mahanand, Anand. English for Academic and Professional Skills. Delhi: McGraw, 2013. Print.
• Nancy Mitchell. Etiquette Rules : A Field Guide to Modern Manners. Wellfleet Press, 2015.
• Rani, D Sudha, TVS Reddy, D Ravi, and AS Jyotsna. A Workbook on English Grammar and Composition. Delhi: McGraw, 2016.
• Raghu Palat, Indian Business Etiquette, Jaico Books, 2015.
• Rizvi, M. Ashraf. Effective Technical Communication. Delhi: McGraw, 2018.
• Pease, Allan and Barbara Pease. The Definitive Book of Body Language. New Delhi: Manjul Publishing House, 2005.
• Tengse, Ajay R. Soft Skills: A Textbook for undergraduates, Orient BlackSwan, 2015

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TALLY LAB

Objective:

To Understand the students' basics of the Computers Knowledge with Financial Software Knowledge

UNIT-I

Basic of Accounting: Type of Accounts, Rules of Accounting, Principles of concepts and conventions, double entry system, bookkeeping Mode of Accounting, Financial Statements, Transaction, Recording Transactions. Getting the functional with Tally, Creation and setting up of company in Tally.

UNIT- II

Accounting Masters in Tally- Features- Configurations- Setting up Account Heads.

UNIT- III

Inventory in Tally- Stock – groups – Stock Categories - Godowns / Location Units of Measure - Stock Items - Creating Inventory Masters for National Trader

Signature of External Member 1

Signature of External Member 2

Signature Industry Expert

Signature BoS, Chairman

Signature of University Nominee

Unit – IV

Sustainable Development: Biodiversity and its conservation, Environmental pollution, air, water and soil pollution., Rainwater harvesting Watershed management. Social security schemes in India-DDP-CRSP-NHRDP-DWACRA-DRDA-Health care programmes.

Unit-V

Concept and Scope of Rural Market, Characteristics of rural markets, Environmental factors: Micro and Macro marketing environment, Marketing planning process, Introduction to services marketing. Fundamentals of Rural Demography and Economics: Rural population –process of development-GATT-WTO-SEZ-CSR-NAIS.

Reference:

1. Satya Sundram, I. "Rural Development" Himalaya Publishing House, New Delhi.

2. K.Venkatareddy-Aricultural and rural development-himalaya publishing house

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L	T	P	C
3	0	0	3

I Year I Semester

RURAL DEVELOPMENT

Course Objectives:

L	T	P	C
3	0	0	3

1. To facilitate the students to understand the basic nature of rural society in India
2. To appraise students about the Rural Local Administration
3. To provide insights on rural demography and rural economy in India
4. To provide insights on various processes and challenges of agriculture in India
5. To make students aware of the rural market structure in India

Outcomes of the course:

1. Describe the key aspects of rural society in India
2. Describe the rural local administration
3. Analyse the dynamics of local rural population and local rural economy
4. Explain the processes and challenges of agriculture in India
5. Summarise the components and implications of land tenure systems and land reforms in India.

Unit-I

Rural Development: Concept, Importance, Nature and scope, Characteristics of rural economy, human capital of development- Distinction between development and growth, Indicators of rural development, problems & issues in rural development.

Unit – II

Rural Management: Nature, Scope and challenges in marketing operations, human and financial resources in rural areas. Entrepreneurship opportunities in rural areas, Agricultural production, productivity and backwardness, Social and Economic structure of rural India and its economic development.

Unit – III

Rural Community Development: M.D.G -Concept of community, Function of Community, PURA model, Community profile: Process and tools. Community development: Characteristics, Principles andscope, Panchayat Raj and community development in India. ; Zilla Parishad - structure, powers,function, working and problems in Rural Administration.

6. Sundaram and Black: "International Business Environment Text and Cases", PHI Private Limited, New Delhi.
7. Avid W Conklin: "Cases in Environment of Business", Sage Publication India Private Ltd, New Delhi. 8. Raj Kumar: "International Business Environment", Excel Publication, New Delhi, 2012.
9. Palle Krishna Rao: "WTO-Text and Cases", Excel Publication, New Delhi.
10. Government of India, Latest Economic Survey Report.

Signature of External Member 1

Signature of External Member 2

Signature Industry Expert

Signature BoS, Chairman

Signature of University Nominee

I Year I Semester

L	T	P	C
4	0	0	4

BUSINESS ENVIRONMENT

OBJECTIVES:

The objective of this paper is to make the students more clear about the importance of business organisation wants to achieve, to earn profit for its growth and development, to provide quality goods to its customers, to protect the environment, etc.

UNIT – I: Introduction: The Concept of Business Environment - its Nature and Significance -Components of Business Environment - Impact of environment on business and strategic decisions.

UNIT – II: Social and Cultural Environment: Introduction - Social environment - Cultural environment - Impact of Foreign Culture on Business - Types of Social Organization - Social Responsibilities of Business.

UNIT – III: Economic Environment: Introduction - Economic environment of Business - Economic systems - Macroeconomic parameters and their impact of business - Economic policies - Five Year Plans in India.

UNIT – IV: Political and Legal Environment: Introduction -Political environment - Relationship between Government and Business in India - Role of Government in Business - Constitutional provisions regarding regulation of business in India. Legal Environment - Implementations of Business - Corporate Governance.

Relevant cases have to be discussed in each unit and in examination **UNIT – V:** Technological and Natural Environment: Features of Technological Environment -Factors and Impact of Technological Environment - Technological Environment in India -Elements of Natural Environment - Environmental Pollution.

Relevant cases have to be discussed in each unit and in examination case is compulsory from any unit.

References:

1. Shaikh Saleem: "Business Environment", Pearsons, New Delhi,
2. Veena Keshav Pailwar: "Economic Environment of Business", PHI Learning, New Delhi, 2012
3. Rosy Joshi, Sangam Kapoor: "Business Environment", Kalyani Publishers, New Delhi, 2011.
4. Aswathappa K: "Essentials of Business Environment", Himalaya Publishing House, New Delhi, 2011.
5. Vivek Mittal: "Business Environment Text and Cases", Excel Books New Delhi, 2011.

I Year I Semester

Signature of External Member 1

Signature of External Member 2

Signature Industry Expert

Signature BoS, Chairman

Signature of University Nominee

MALINENI LAKSHMAIAH
WOMEN'S ENGINEERING COLLEGE
ESTD : 2008
Approved by AICTE, New Delhi, Affiliated to JNTUK, Kakinada : : Accredited by "NBA" for our CSE & ECE and NAAC A+ Grade
CSE & ECE - 2022-2025
Pulladigunta (V) Vatticherukuru (M), Guntur (Dist.)

I Year I Semester

L	T	P	C
4	0	0	4

ENTREPRENEURSHIP DEVELOPMENT

UNIT I

Introduction: Definition of Entrepreneur, Entrepreneurial motivation and barriers; Internal and external factors Economic Barriers to Entrepreneurship –Non-Economic Barriers to Entrepreneurship- Theories of entrepreneurship; Classification of entrepreneurship-Entrepreneurship in Developing Economy – Entrepreneurial Values and Attitudes

UNIT II

Problems & Support: Incubation and Take-off, Problems encountered Structural, Financial and Managerial Problems, Types of Uncertainty. -Institutional support for new ventures: Supporting organizations; Incentives and facilities; Financial Institutions and Small-scale Industries, Govt. Policies for SSIs.-Role of SIDBI in Project Management.

UNIT IV

Types of Entrepreneurs: Family and non-family entrepreneurs - Role of Professionals,

Professionalism vs. family entrepreneurs—Sick industries, Reasons for Sickness, Remedies for Sickness, Role of BIFR in revival, Bank Syndications.

Unit IV

Project Analysis: Meaning and Definition of Project, Types & Characteristics – Project Phases – Project Life Cycle – Project Family Tree – Feasibility Analysis and Project Report.

Unit V

Development of Enterprise: Concept and development of Enterprise - Procedure of starting Enterprise – Vital Decision to make during start up: Project Report Preparation, Choice of Enterprise, and Market Assessment of Enterprise.

References:

1) Couger, C-Creativity and Innovation (IPP, 1999)
2) Nina Jacob, -Creativity in Organisations (Wheeler, 1998)

3) Jonne & Ceserani-Innovation & Creativity(Crest) 2001.
4) Bridge Setal-Understanding Enterprise: Entrepreneurship and Small Business (Palgrave,2003)
5) Holt-Entrepreneurship: New Venture Creation (Prentice-Hall) 1998.
6) Singh P&B handerkar A-Winning the Corporate Olympiad: The Renaissancearadigm(Vikas)
7) Dollinger M J-Entrepreneurship (Prentice-Hall, 1999).
8) Tushman, M.L. & Lawrence, P.R. (1997)-Managing Strategic Innovation & Change Oxford .
9) Jones T. (2003)-Innovating at the Edge: How Organizations Evolve and Embed Innovation Capability.Butterwork Heinemann, U. K.
10) Amidon, D. M.(1997)-Innovation Strategy for the Knowledge Economy:TheKanawakening. Butterwork-Heinemann, New Delhi, India.

UNIT IV:

Concept of Estimation and Sampling: Inferential Analysis-Point Estimates and Interval Estimates of Averages and Proportions of small and large samples. Sampling –Meaning, Steps in Sampling Process-Sample Size- Probability and non- probability sampling techniques, Errors in sampling.Tests of significance- Types- Hypothesis-Types- Hypothesis testing and Confidence Intervals. Parametric Tests for means, Proportions, Variance and Paired Observations.

UNIT V:

Analysis of Variance (ANOVA): One-way and Two Way ANOVA, Non Parametric tests- Chi–Square- Test of Independence, Test of Goodness of Fit.

Relevant cases have to be in each unit and in examination case is compulsory forevery unit.

References:

1 N.D. Vohra "Quantitative Techniques in Management", Tata-McGraw Hill Private Limited, New Delhi, 2011.
2 Gupta S.P "Statistical Methods'', S. Chand and Sons, New Delhi.
3 Anand Sharma "Quantitative Techniques for Business decision Making HimalayaPublishers, New Delhi, 2012.
4 D.P. Apte "Operation Research and Quantitative Techniques", Excel Publications, NewDelhi, 2013.
5 Hamdy, A. Taha "Operation Research. An Introduction", Prentice-Hall of India, New Delhi, 2003.
6 Anderson "Quantitative Methods for Business", Cengage Learning, New Delhi, 2013.

Signature of External Member 1

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Signature of University Nominee

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CSE & ECE - 2022-2025
Pulladigunta (V) Vatticherukuru (M), Guntur (Dist.)

I Year I Semester

L	T	P	C
4	0	0	4

QUANTITATIVE ANALYSIS FOR BUSINESS DECISIONS

Course Objectives:

1: To develop a deeper understanding of meaning and importance of technique and its applications in managerial decisions.
2: Statistical tools like measures of central tendency & measures of variations and apply these tools to real life situations.
3: Students have more knowledge about the decision making concept, process of decision making and different environments like risk, uncertainty and certainty.
4: To have knowledge about Sampling and Sampling Distributions-Estimation-Point and Interval Estimates, Concepts of Testing Hypothesis.
5: Students would able to understand the concept of ANOVA, Chi-square Test of Independence and Goodness of fitness.

Course Outcomes:

At the end of the course students will be able to:

1 Basic importance and applications of quantitative techniques.
2 Study the various measures and applicability of probability related to the statistics.
3 Justify the several decisions in decision theory.
4 Use and understand the different sampling distribution techniques.
5 Test the hypothesis for choosing best conclusion and inference.

UNIT 1:

Quantitative Techniques: Introduction - Meaning and Definition – Classification of QT -QT and other disciplines – Application of QT in business – Limitations.

UNIT II:

Measure of Central Tendency and Dispersions- Arithmetic Mean; Geometric Mean; Harmonic Mean; Median:Mode, Standard Deviation. Simple correlation- Karl Pearson's Coefficient of correlation, Rank correlation .Simple Regression Analysis – Concept of Probability-Probability Rules-Joint and Marginal probability-Baye's Theorem-Probability Distributions - Binominal, Poisson, Normal & Exponential Probability Distributions.

UNIT III:

Introduction of Decision Theory: Steps involved in decision making, different environments in which decisions are made, Criteria for decision making, Decision making under uncertainty, Decision making under conditions of Risk-Utility as a decision criterion, Decision trees, Graphic displays of the decision-making process, Decision making with an active opponent.

I Year I Semester

Signature of External Member 1

Signature of External Member 2

Signature Industry Expert

Signature BoS, Chairman

Signature of University Nominee

I Year I Semester

L	T	P	C
4	0	0	4

ACCOUNTING FOR MANAGEMENT

COURSE OBJECTIVES:

The objective of this course is to acquaint the students regarding various accou ting concepts and its application in managerial decision making.

Unit – I:

Financial Accounting- concept, Importance and scope, accounting principles, accounting cycle, journal, ledger, trial balance, Preparation of final accounts with adjustments.

Unit – II:

Analysis and interpretation of financial statements – meaning, importance and techniques, ratio analysis, Fund flow analysis, cash flow analysis (AS - 3).

Unit – III:

Cost accounting–meaning, importance, methods, techniques; classification of osts and cost sheet; Inventory valuation methods- LIFO, FIFO, HIFO and weighted average ethod

Unit – IV:

Management accounting – concept, need, importance and scope; budgetary control-meaning, need, objectives, essentials of budgeting, different types of budgets and their preparation.

Unit-V:

Standard costing and variance analysis (materials, labour)-Marginal costing and its application in managerial decisi on making

Relevant cases have to be discussed in each unit and in examination case is compulsoryfrom any unit.

References:

lishing

1. MAHESWARI AND MAHESWARI" Financial Accounting", Vikas Pu House, New Delhi, 2013.
2. Pandey, I.M. Management Accounting, Vikas Publishing House, New Delhi.
3. Horngen, Sundem & Stratton, Introduction to Management Accounting, Pearson Education, New Delhi.
4. Hansen & Mowen, Cost Management, Thomson Learning.
5. Mittal, S.N. Management Accounting and Financial management, Shree Mahavir Book Depot, New Delhi.
6. Jain S.P. and Narang K.L. Advanced Cost Accounting, Kalyani Publishers Ludhiana.
7. Khan M.Y. and Jain, P.K. Management Accounting, TMH, N. Delhi.

UNIT-III:

Cost and Production Analysis:Cost: Concept and types, Cost-Output Relationships, Cost Estimation, Reduction and Control- Economies and Diseconomies of Scale- Law of Variable Proportions- Returns to Scale- Isoquants-Cobb-Douglas and CES Production functions.

UNIT-IV:

Theory of Pricing: Price determination under Perfect Competition, Monopoly, Oligopoly and Monopolistic Competitions- Methods of Pricing. Market structures: Perfect and Imperfect Market Structurer. Price discrimination-degrees of price discrimination.

UNIT-V:

Macro Economics and Business: Concept, Nature and Measurement of National Income- - Fiscal and Monetary Policies. Inflation and Deflation: Inflation - Meaning and Kinds, Types, Causes and measurement of inflation Measures to Control Inflation, Deflation- - Philips curve- Stagflation-The cry of Employment- Business cycles: Policies to counter Business Cycles.

Relevant cases have to be discussed in each unit and in examination case is compulsoryfrom any unit.

References:

1. D.M.Mithani, Managerial Economics, Himalaya Publishing House
2. Hirschey-Managerial economics,12th ed-cengage
3. Gupta G.S., Managerial Economics, TMH, 1988.
4. P.L. Mehta, Managerial Economics, PHI, 2001.
5. K .KDawett, Modern Economic Theory, Sultan Chand & Sons.
6. D.N. Dwivedi, Managerial Economics, 7th Ed, Vikas Publishing.
7. H.Craig Peterson, W.CrisLewis,managerialeconomics ,Pearson, 2005.

Signature of External Member 1

Sinature of External Member 2

Signature Industry Expert

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L	T	P	C
4	0	0	4

I Year I Semester **MANAGERIAL ECONOMICS**

Course Objective:

L	T	P	C
4	0	0	4

1: Objective of the course is to introduce basic concepts and techniques of Managerial Economics and comprehend student with vital decisions of business.

2: Assimilate and apply the laws of economics in the business.

3: Acquire the knowledge about the various types of market structure for strategizing and wise decision making.

4: Practice the pricing strategies in the business management policies.

5: Achieve the knowledge about macro economics to foresee the external forces to the effective decisions in organisation.

Learning Outcomes: Use supply and demand to explain various economic phenomena and principles.

1. Explain the economic meaning of price, elasticity, and production costs. Describe the cause and effect of changes in all of these variables.

2. Draw and analyze cost and revenue curves that maximize profit.

3. Discuss differences and critically analyze the pros and cons of different market structures, including competitive, monopolistic and oligopolistic markets.

4. Pricing strategies to achieve and applicability in the market conditions

5. Knowledge about macroeconomics conditions and learn to applicable in the present context.

UNIT-I:

Introduction to Managerial Economics: Nature and Scope- of managerial Economics: Incremental reasoning, Concept of Time Perspective, Discounting Principle, Opportunity Cost Principle, Equi -Marginal Concept-Theory of Firm-profit measurement-social responsibility of business.

UNIT-II:

Demand Analysis and Forecasting: Concepts of Demand, Supply, Determinants of Demand and Supply, Elasticities of Demand and Supply- Methods of demand forecasting for established and new products-.

Unit – V:

Organizational conflict-causes and consequences-conflict and Negotiation Team Building, Conflict Resolution in Groups and problem solving Techniques – Organizational change - change process - resistance to change - Creating an Ethical Organization.

Relevant cases have to be discussed in each unit and in examination case is compulsoryfrom any unit.

References:

1. Harold Koontz, Heinz Weihrich, A.R.Aryasri, Principles of Management, TMH, 2010.
2. Dilip Kumar Battacharya, Principles of Management, Pearson, 2012.
3. Kumar, Rao, Chhaalill "Introduction to Management Science" Cengage Publications. New Delhi
4. V.S.P.Rao, Management Text and Cases, Excel, Second Edition, 2012.
5. K.Anbuvelan, Principles of Management, University Science Press, 2013.
6. K.Aswathappa " Organisational Behaviour-Text, Cases and Games", Himalaya Publishing House, New Delhi,2008.
7. Steven L Mc Shane, Mary Ann Von Glinow, Radha R Sharma: "Organisational Behaviour", TMH Education, New Delhi,2008

Signature of External Member 1

Signature of External Member 2

Signature Industry Expert

Signature BoS, Chairman

Signature of University Nominee

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I Year I Semester

L	T	P	C
4	0	0	4

MANAGEMENT AND ORGANIZATIONAL BEHAVIOR

Objective of the course:

Objective of the course is to give a basic perspective of Management.

This will form foundation to study other functional areas of management and to provide the Students with the conceptual Framework and the theories underlying Organizational Behaviour.

Unit – I

Definition, Nature, Functions and Importance of Management – Evolution of Management thought – Scientific management, administrative management, Haw throne experiments – systems approach - Levels of Management - Managerial Skills - Planning – Steps in Planning Process – importance and Limitations – Types of Plans - Characteristics of a sound Plan - Management By Objectives (MBO) - Techniques and Processes of Decision Making - Social Responsibilities of Business

Unit-II

Organizing – Principles of organizing – Organization Structure and Design – Types of power - Delegation of Authority and factors affecting delegation – Span of control – Decentralization – Line and staff structure conflicts - Coordination definition and principles - Emerging Trends in Corporate Structure – Formal and Informal Organization- Nature and importance of Controlling, process of Controlling, Requirements of effective control and controlling techniques.

Unit – III

Organizational behavior: Nature and scope – Linkages with other social sciences – Individual roles and organizational goals – perspectives of human behavior - Perception– perceptual process – Learning - Learning Process- Theories - Personalit[4]y and Individual Differences - Determinants of Personality - Values, Attitudes and Beliefs - Creativity and Creative thinking.

Unit – IV

Motivation and Job Performance – Content and process Theories of Motivation - Leadership - Styles - Approaches – Challenges of leaders in globalized era – Groups – stages formation of groups – Group Dynamics - Collaborative Processes in Work Groups - Johari Window- Transactional Analysis.

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ACADEMIC REGULATIONS
COURSE STRUCTURE & DETAILED SYLLABUS
For
MASTER OF BUSINESS ADMINISTRATION
(Applicable for the batches admitted from 2024-25)

MALINENI LAKSHMAIAH
WOMEN'S ENGINEERING COLLEGE
(AUTONOMOUS)

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Pulladigunta (Vil), Vatticherukuru (Md), Prathipadu Road, Guntur – 522 017 A.P.

Department of **Master of Computer Applications**
Minutes of the Board of Studies (BoS) Meeting

The Second BoS meeting of Master of Computer Applications Department was conducted on **11-09-2024** from **11:30 a.m** through virtual mode via Zoom Online Meeting Platform.

Members Present :

S.No.	Members	Name & Designation	Status of Attendance	Signature
1	Chairperson	Dr P. Ramesh Babu HoD of MCA, MLWEC	PRESENT	
2	University Nominee	Dr D. Haritha Professor of CSE, UCEK, JNTU Kakinada Ph: 9440810901 Email : harithadasari9@yahoo.com harithadasari@jntucek.ac.in	PRESENT	
3	Subject expert from outside the parent University	1. Dr.M.Babu Reddy Assoc. Professor, Department of Computer Science, KU Ph: 9963436460 Email:m_babureddy@yahoo.com principal.krucet@kru.ac.in	PRESENT	
		2. Dr. V. Denish Kumar HoD, Professor, Dept.of CSE, RVIT Ph: 9014098028 Email: dineshbabuvunnava@gmail.com	PRESENT	
5	Representative from Industry	K Sambi Reddy Sr. DBA, Sequential Technology International Pvt.Ltd., Hyderabad Ph: 9491583104 Email:	PRESENT	

		sambireddy.kalli@gmail.com		
6	Alumni Member	********** ********** Ph: Email:	NA	
7	Member	Mr. K.Uma Maheswara Rao Assoc. Prof, MLWEC	PRESENT	Kumr
8	Member	Mrs. Y.Naga Padmaja Assoc. Prof, MLWEC	PRESENT	
9	Member	Mrs. K.Mounika Asst. Prof, MLWEC	PRESENT	K. Mounika.

Meeting Agenda:

Item No: 1

Discussion on Academic Regulations MR-24

Item No: 2

Discussion on Proposed Course Structure of 1st Year MCA.

Item No: 3

Discussion on Proposed Syllabus of Courses Offered by Department Courses in 1st Year MCA

Item No: 4

Any Other Points raised by BoS Members with the permission of chair.

Resolutions:

Item No : 1 - Discussion on Academic Regulations MR-24

At the onset, the Chairperson of BoS members, **Dr P.Ramesh Babu** welcomed all the members and introduced internal BoS members to external BoS members. The meeting began with presentation of proposed Academic Regulations MR24, all all the members are agreed for the same.

Academic Regulations MR-24 of MCA are attached herewith.

Item No : 2 - Discussion on Proposed Course Structure of 1st MCA Sem -I & Sem -II and Ratification of the same.

Proposed Course Structure offered by the Department of MCA is presented before the BoS Members and asked for the modifications if any, and it is ratified by all the members.

Course Structure:

SEMESTER–WISE COURSE STRUCTURE

I Semester

S.No	Course Code	Course Name	Category	L	T	P	Credits
1	MCA1101	Data Structures	PC	3	0	0	3
2	MCA1102	Computer Organization	PC	3	0	0	3
3	MCA1103	Database Management Systems	PC	3	0	0	3
4	MCA1104	Operating Systems	PC	3	0	0	3
5	MCA1105	Mathematical and Statistical Foundations	BS&H	3	1	0	4
6	MCA1106	Database Management Systems Lab	PC	0	0	3	1.5
7	MCA1107	Data Structures using C Lab	PC	0	0	4	2
8	MCA1108	Operating Systems and Linux Lab	PC	0	0	3	1.5
			Total	15	1	10	21

II Semester

S.No	Course Code	Course Name	Category	L	T	P	Credits
1	MCA1201	Computer Networks	PC	3	0	0	3
2	MCA1202	Network Security and Cyber Security	PC	3	0	0	3
3	MCA1203	Object Oriented Programming Using JAVA	PC	3	0	0	3
4	MCA1204	Software Engineering	PC	3	0	0	3
5	MCA1205	Artificial Intelligence	PC	3	0	0	3

6	MCA1206	**Program Elective-1** 1. Design and Analysis of Algorithms 2. Advanced Unix Programming 3. Data Warehousing and Data mining 4. MOOCS-1(NPTEL / SWAYAM) (Recommended 12 weekcourse with 3 credits)	PC/ PE	3	0	0	3
7	MCA1207	Object Oriented Programming Using JAVA Lab	PC	0	0	3	1.5
8	MCA1208	Networks and Security Lab	PC	0	0	3	1.5
9	MCA1209	Employability Skills-1[$]	AC	1	0	0	0
			Total	19	0	6	21

Item No : 3 - Discussion on Proposed Syllabus of Courses Offered by Department in I-Year MCA i.e., I Sem & II Sem.

The Chairperson gave a presentation regarding the proposed course syllabi. All the members are approved the syllabus presented.

And the approved syllabus is attached herewith.

Item No : 4 Any Other Points raised by BoS Members with the permission of chair.

1. **Discussed about supplementary examinations for MCA.**

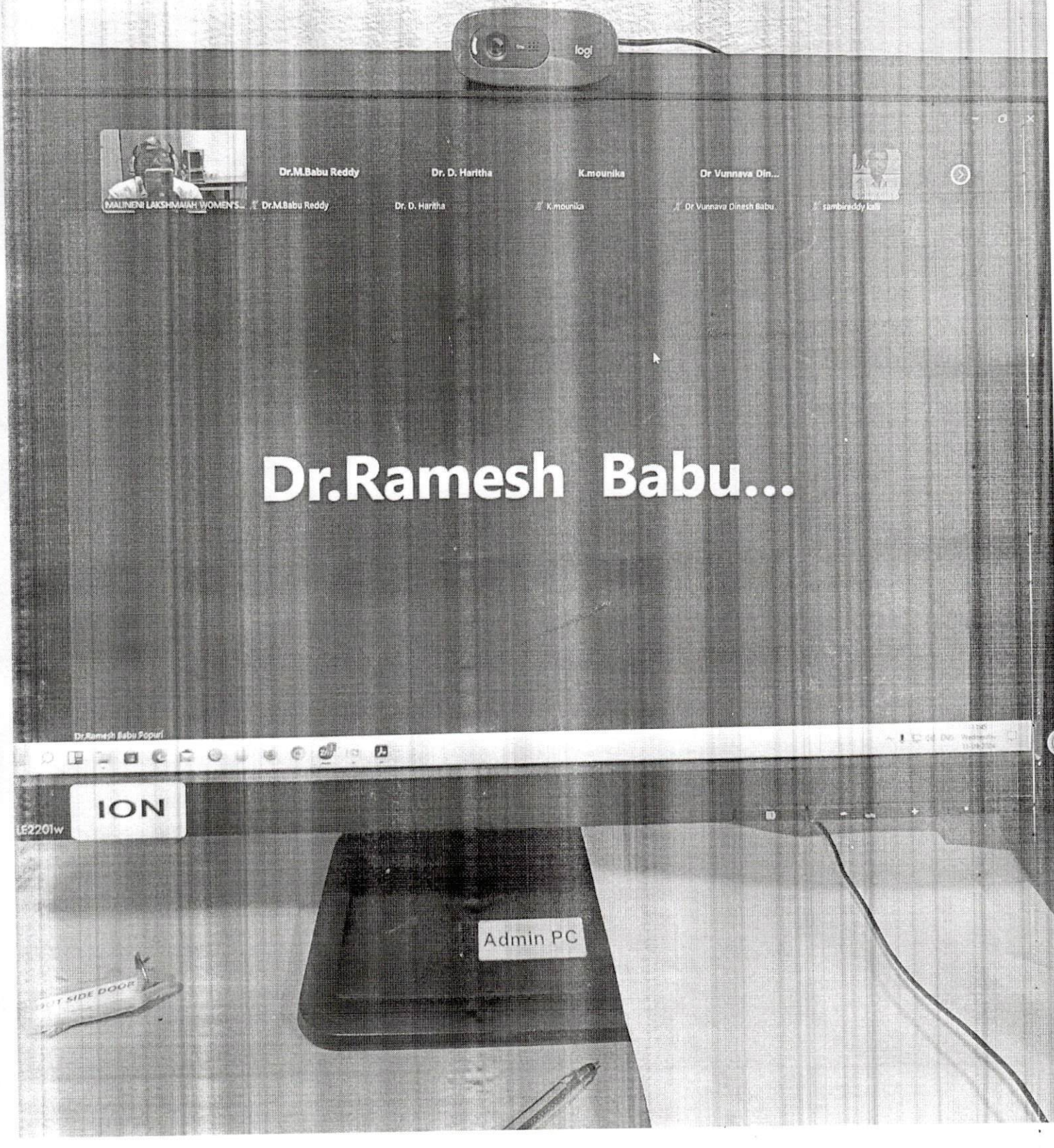
At the time of conduct of the BoS meeting for 1st MCA course, JNTUK has decided only R24 course structure but not the regulations. When the new regulations are provided by JNTUK after the BoS Meeting , those regulations will be implemented in our college without any modifications.

Finally, Chairperson of BoS thanked all the members of their valuable inputs and active participation in the meeting.

Chairperson
BoS-MCA, MLEW.

HOD
Department of MCA
MALINENI LAKSHMAIAH WOMEN'S
ENGINEERING COLLEGE
AUTONOMOUS
PULLADIGUNTA, GUNTUR-522 017.

M Babu Reddy
V. Dinesh Babu
K. sambi Reddy



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WELCOME

BoS Meeting

DEPARTMENT OF MCA

11-09-2024 11:30 A.M

M Babu Reddy
V. Ramesh Babu.
K. Sambi Reddy.

Presented By
Dr. P. Ramesh Babu
Chair Person , Board of Studies
Department of MCA

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2024 (MR24)

MASTER OF COMPUTER APPLICATIONS (MCA)

CURRICULUM

MCA Regular – I Year

(Applicable for the batches admitted from 2024-2025)

M Babu Reddy
V. Dinesh Babu
K. Sambi Reddy

I Semester

S.No	Course Code	Course Name	Category	L	T	P	Credits
1	MCA1101	Data Structures	PC	3	0	0	3
2	MCA1102	Computer Organization	PC	3	0	0	3
3	MCA1103	Database Management Systems	PC	3	0	0	3
4	MCA1104	Operating Systems	PC	3	0	0	3
5	MCA1105	Mathematical and Statistical Foundations	BS&H	3	1	0	4
6	MCA1106	Database Management Systems Lab	PC	0	0	3	1.5
7	MCA1107	Data Structures using C Lab	PC	0	0	4	2
8	MCA1108	Operating Systems and Linux Lab	PC	0	0	3	1.5
			Total	15	1	10	21

M Babu Reddy V. Dinesh Babu K. Sambi Reddy

II Semester

S.No	Course Code	Course Name	Category	L	T	P	Credits
1	MCA1201	Computer Networks	PC	3	0	0	3
2	MCA1202	Network Security and Cyber Security	PC	3	0	0	3
3	MCA1203	Object Oriented Programming Using JAVA	PC	3	0	0	3
4	MCA1204	Software Engineering	PC	3	0	0	3
5	MCA1205	Artificial Intelligence	PC	3	0	0	3
6	MCA1206	**Program Elective-1** 1. Design and Analysis of Algorithms 2. Advanced Unix Programming 3. Data Warehousing and Data mining 4. MOOCS-1(NPTEL /SWAYAM) (Recommended 12 week course with 3 credits)	PC/ PE	3	0	0	3
7	MCA1207	Object Oriented Programming Using JAVA Lab	PC	0	0	3	1.5
8	MCA1208	Networks and Security Lab	PC	0	0	3	1.5
9	MCA1209	Employability Skills-1[$]	AC	1	0	0	0
			Total	19	0	6	21

*This may be conducted in Zero Hour.

[$]Internal Evaluation

M Babu Reddy V. Dinesh Babu K. Sanki Reddy

MCA I Semester

L	T	P	C
3	0	0	3

DATA STRUCTURES

Course Objectives:
The objective of this course is to explore basic data structures such as stacks and queues, introduce a variety of data structures such as hash tables, search trees, tries, heaps, graphs, sorting and pattern matching algorithms

UNIT-I:
Introduction to C: Constants and variables, Operators and Expressions, Managing Input and Output operators, Decision making-branching and looping, Arrays

UNIT-II:
Functions, Structures and Unions, Pointers, File handling in C.

UNIT–III:
Data structure: Definition, types of data structures Recursion Definition, Design Methodology and Implementation of recursive algorithms, Linear and binary recursion. Preliminaries of algorithms, analysis and complexity. **Linear list**–singly linked list, Double linked list and circular linked list -implementation, insertion, deletion and searching operations on linear list.

UNIT-IV:
Stacks-Operations, array and linked representations of stacks, stack applications, **Queues**-operations, array and linked representations. **Hash Table Representation:** hash functions, collision resolution-separate chaining, open addressing-linear probing, quadratic probing, double hashing and rehashing, extendible hashing.

UNIT-V:
Sorting Techniques: Insertion sort, selection sort, exchange-bubble sort, quick sort and merge sort Algorithms. **Trees:** Binary Trees, terminology, representation and traversals- pre, posts in order traversals. **Search Trees:** Binary Search Trees, Definition, Implementation, Operations-Searching, Insertion and Deletion, AVL Trees, Red-Black Trees

Text Books:

1. Programming in ANSI C,5e, E.Balagurusamy,TMH
2. Fundamentals of Data Structures in C, 2nd Edition, E. Horowitz, S. Sahni and Susan Anderson Freed, Universities Press.
3. Data Structures using C – A. S. Tanenbaum, Y. Langsam, and M.J. Augenstein, PHI/Pearson Education.

Reference Books:

1. Data Structures: A Pseudocode Approach with C,2nd Edition, R.F.Gilberg and B. A. Forouzan, Cengage Learning.

Web Resources:

1. https://archive.nptel.ac.in/courses/106/102/106102064/
2. https://ocw.mit.edu/courses/6-006-introduction-to-algorithms-spring-2020/video_galleries/lecture-videos/
3. https://www.cs.usfca.edu/~galles/visualization/Algorithms.html
4. https://visualgo.net/en
5. https://elearn.daffodilvarsity.edu.bd/course/view.php?id=11771

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MCA I Semester

L	T	P	C
3	0	0	3

COMPUTER ORGANIZATION

Course Objectives:

The objectives of this course are to

- Conceptualize the basics of organizational and architectural issues of a digital computer.
- Learn the function of each element of a memory hierarchy.
- Study various data transfer techniques in digital computers.

UNIT I:

Basic Structure Of Computers: Computer: Types, Functional units, Basic Operational concepts, Bus structures, Software, Performance, multiprocessor and multi computers, Historical perspective.

UNIT II:

Machine Instructions and Programs: Numbers, Arithmetic Operations, and Characters, Memory locations and addresses, Memory operations, Instructions and Instruction sequencing, Addressing Modes, Assembly Languages, stacks and Queues Basic Input/output Operations, role of Stacks and Queues Additional Instructions

UNIT III:

Input/ Output Organization: Accessing I/O Devices, Interrupts, Processor examples, Direct Memory Access, Buses, Interface Circuits, and Standard I/O Interfaces

UNIT IV:

The Memory Systems: Some Basic concepts, Semiconductor RAM memories, Memory System Consideration, Read-Only Memories, Speed, Size, and cost, Cache Memories, Performance considerations, Virtual Memories, Memory Management Requirements, Secondary Storage

UNIT IV:

Parallel Processing: Basic concepts, Pipeline Processors, Multiprocessors

Text Books:

1. Computer Organization, Carl Hamacher, ZvonksVranesic, Safea Zaky,5th Edition, McGraw Hill.
2. Computer Architecture and Organization, John P. Hayes,3rdEdition, McGraw Hill

M Babu Reddy V. Dinesh Babu K. Sambi Reddy

Reference Books:

1. Computer Organization and Architecture, William Stallings Sixth Edition, Pearson/PHI
2. Structured Computer Organization, Andrew S. Tanenbaum, 4th Edition PHI/Pearson
3. Fundamentals of Computer Organization and Design, Siva ramaDandamudi Springer Int. Edition.

Web Resources:

1. https://nptelvideos.com/course.php?id=396
2. https://onlinecourses.nptel.ac.in/noc20_cs64/preview
3. https://www.learncomputerscienceonline.com/computer-organization-and-architecture/
4. http://williamstallings.com/COA/COA8e-student/index.html

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MCA I Semester

L	T	P	C
3	0	0	3

DATABASE MANAGEMENT SYSTEMS

Course Objectives:

This Course will enable students to

- Explain the concept of data bases, database management systems, database structures and how they work.
- Make use of Entity-Relationship Modeling and Relational Modeling for creating simple databases from the real world scenarios.
- Write relational algebra and structured query language(SQL)statements.
- Normalize a database using Normalization Rules.
- Discuss the issues associated with Transaction Management and Recovery, Tree Structured and Hash-Based Indexing

UNIT – I: Overview of Database System: Database System Applications, Purpose of Database Systems, View of Data, Database Languages, Relational Databases, Database Design, Data Storage and Querying, Transaction Management, Database Architecture, Data Mining and Information Retrieval, Specialty Databases, Database Users and Administrators, History of Database Systems. [Text Book -2]

Introduction to Database Design: Database Design and ER Diagrams, Entities, Attributes and Entity Sets, Relationships and Relationship Sets, Additional Features of the ER Model, Conceptual Design with the ER Model, Extended ER features [Text Book -1]

UNIT – II: Relational Model: Introduction to the Relational Model, Integrity Constraints over Relations, Enforcing Integrity Constraints, Querying Relational Data, Logical Database Design: ER to Relational, Introduction to Views, Destroying/Altering Tables and Views [Text Book -1]

Relational Algebra: Selection and Projection, Set Operations, Renaming, Joins, Division, More Examples of Algebra Queries, **Relational Calculus:** Tuple Relational Calculus, Domain Relational Calculus [Text Book -1]

UNIT – III: SQL: Queries, Constraints, Triggers: The Form of a Basic SQL Query, UNION, INTERSECT and EXCEPT, Nested Queries, Aggregate Operators, Null Values, Complex Integrity Constraints in SQL, Triggers, Exceptions, Procedures, Functions [Text Book -1]**Normal Forms:** Introduction to Schema Refinement, Functional Dependencies, Reasoning about FDs, Normal Forms, Properties of Decompositions, Normalization. [Text Book -1]

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UNIT – IV: Schema Refinement: Multivalued dependencies, Fourth Normal form,Join Dependencies, Fifth Normal Form, Lossless join, dependency preservation.[Text Book -1] **Transaction Management:** Transaction Concepts, Transaction state, Implementation of Atomicity and Durability, Concurrent Execution, Serializability, Recoverability. [Text Book -2] **Concurrency Control**: Lock-based Protocols: Locks, Granting of Locks, Two Phase Locking Protocol, Implementation of locking; Timestamp-Based Protocols: Time Stamps, Time Stamp Ordering protocol, Thomas Write Rule, Validation-Based Protocols [Text Book -2]

UNIT – V: Overview of Storage and Indexing: Data on External Storage, File organization and indexing: Clustered Indexes, Primary and Secondary Indexes; Index Data Structures: Hash and Tree based indexing; Comparison of File organizations. [Text Book -1] **Tree Structured Indexing**: Intuitions for Tree Indexes, Indexed Sequential Access Method (ISAM), B+ Trees: A Dynamic Index Structure, Search, Insert, Delete, Duplicates, B+ Trees in Practice [Text Book -1]

Text Books:

1. Database Management Systems, 3/e, Raghurama Krishnan, Johannes Gehrke, McGraw-Hill
2. Database System Concepts, 6/e, Abraham Silberschatz, Henry F. Korth, S. Sudarshan, McGraw-Hill
3. DatabaseSystems,9/e, Carlos Coronel, Steven Morris, PeterRob, Cengage

Reference Books:

1. Introduction to Database Systems,8/e, CJ Date, Pearson
2. Database Systems,6/e RamezElmasri, ShamkantB.Navathe, Pearson

Web Resources:

1. https://nptel.ac.in/courses/106105175
2. https://onlinecourses.swayam2.ac.in/cec22_cs18/preview
3. https://cs186berkeley.net/
4. https://www.youtube.com/playlist?list=PL52484DF04A264E59
5. https://courses.cs.washington.edu/courses/cse414/17au/calendar/lecturelist.html
6. https://www.db-book.com/slides-dir/index.html

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MCA I Semester

L	T	P	C
3	0	0	3

OPERATING SYSTEMS

Course Objectives:

This course enables the student to

- Introduce different types of operating systems.
- Learn process management techniques.
- Learn various memory management techniques.
- Introducing the architecture of the Linux operating system.
- Learn multiple operating systems like Unix and Windows.

UNIT–I:

Introduction to Operating System Concept: Types of Operating Systems, Operating Systems Concepts, Operating System Operations. Operating Systems Structures-Operating System Services, User Operating-System Interface, Introduction to System calls, Types of System Calls.

UNIT–II:

Process Management: Process concept, Process State Diagram, Process control block, Process Scheduling, Inter process Communication, Threads-Threading Issues, Scheduling-Basic Concepts, Scheduling Criteria, Scheduling Algorithms.

UNIT-III:

Process Synchronization: The Critical-Section Problem, Peterson's Solution, Synchronization Hardware, Semaphores, Classic Problems of Synchronization, Monitors, **Principles of deadlock:** System Model, Deadlock characterization, Deadlock handling, Deadlock Prevention, Detection and Avoidance, Recovery Starvation, Critical Regions form Deadlock

UNIT–IV:

Memory Management: Swapping, Contiguous Memory Allocation, Paging, structure of the Page Table, Segmentation Virtual Memory Management- Demand Paging, Page-Replacement Algorithms, Thrashing. **File-System Interface:** File Concept, Access Methods, Directory structure, File-System mounting, Files Sharing, Protection. File-System implementation- File-System Structure, Allocation Methods, Free-Space Management, Disk Structure, Disk Scheduling

V. Dinesh Babu K. Sambi Reddy

UNIT-V:

Case Studies: Linux System: Design Principles, kernel Modules, Process Management, File Systems, Input and Output, Interprocess Communication, Network Structure, Security. **Windows 7:** Design Principles, System Components, Terminal Services and Fast User, File System, Networking, Programmer Interface.

Text Books:

1. Operating System concepts, Abraham Siliberschatz, Peter Baer Galvin, Greg Gagne, John Wiley &Sons,Inc., Edition 9,2011
2. Introduction to UNIX and Shell Programming, M.G.VenkateshMurhty, Pearson, 2005
3. UNIX & Shell Programming, B.M.Harwani, OXFORD University Press,2013

Reference Books:

1. Advanced Programming in the UNIX Environment, W.Richard Stevens, Stephen Rago, Wesley Professional, 2013
2. UNIX Network Programming, W.Richard Stevens,1990
3. Operating Systems, William stallings, PHI/Pearson,6/E,2009
4. Operating Systems, Dietal, Dietal, Pearson,3/e,2007
5. Operating Systems,Dhamdhere,TMH,2/e,2009

Web References:

1. https://onlinecourses.swayam2.ac.in/cec20_cs06/preview
2. https://www.cse.iitb.ac.in/~mythili/os/
3. https://onlinecourses.nptel.ac.in/noc21_cs72/preview
4. https://web.stanford.edu/~ouster/cgi-bin/cs140- spring20/lectures.php
5. https://oscourse.org/
6. https://www.cs.jhu.edu/~huang/cs318/fall21/schedule. html

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MCA I Semester

L	T	P	C
3	1	0	4

MATHEMATICAL AND STATISTICAL FOUNDATIONS

Course Objectives:

This course is aimed at enabling the students to

- To understand the mathematical fundamentals that are prerequisites for a variety of courses like Data mining, Network protocols, analysis of Web traffic, Computer security, Software engineering, Computer architecture, operating systems, distributed systems bioinformatics, Machine learning.
- To develop the understanding of the mathematical and logical basis to many modern techniques in computer science technology like machine learning, programming language design, and concurrency.
- To study various sampling and classification problems.

UNIT- I:

Basic Probability and Random Variables: Random Experiments, Sample Spaces Events, the Concept of Probability the Axioms of Probability, Some Important Theorems on Probability Assignment of Probabilities, Conditional Probability Theorems on Conditional Probability, Independent Events, Bayes Theorem or Rule. Random Variables, Discrete Probability Distributions, Distribution Functions for Random Variables, Distribution Functions for Discrete Random Variables, Continuous Random Variables

UNIT -II:

Sampling and Estimation T eory: Population and Sample, Statistical Inference Sampling With and Without Replacement Random Samples, Random Numbers Population Parameters Sample Statistics Sampling Distributions, Frequency Distributions, Relative Frequency Distributions, Computation of Mean, Variance, and Moments for Grouped Data. Unbiased Estimates and Efficient Estimates Point Estimates and Interval Estimates. Reliability Confidence Interval Estimates of Population Parameters, Maximum Likelihood Estimates

UNIT -III:

Tests of Hypothesis and Significance: Statistical Decisions Statistical Hypotheses. Null Hypotheses Tests of Hypotheses and Significance Type I and Type II Errors Level of Significance Tests Involving the Normal Distribution One-Tailed and Two-Tailed Tests P Value Special Tests of Significance for Large Samples Special Tests of Significance for Small Samples Relationship between Estimation Theory and Hypothesis Testing Operating Characteristic Curves. Power of a Test Quality Control Charts Fitting Theoretical Distributions to Sample Frequency Distributions, The Chi-Square Test for Goodness of Fit Contingency Tables Yates' Correction for Continuity

V. Dinesh Babu K. Sambi Reddy

Coefficient of Contingency.

UNIT-IV:

Algebraic Structures and Number Theory: Algebraic Systems, Examples, General Properties, Semi Groups and Monoids, Homomorphism of Semi Groups Semi Groups and Monoids, Group, Subgroup, Abelian Group, Homomorphism, Isomorphism. Properties of Integers, Division Theorem, The Greatest Common Divisor, Euclidean Algorithm, Least Common Multiple, Testing for Prime Numbers, The Fundamental Theorem of Arithmetic, Modular Arithmetic (Fermat's Theorem and Euler's Theorem)

UNIT-V:

Graph Theory: Basic Concepts of Graphs, Sub graphs, Matrix Representation of Graphs: Adjacency Matrices, Incidence Matrices, Isomorphic Graphs, Paths and Circuits, Eulerian and Hamiltonian Graphs, Multigraphs, Planar Graphs, Euler's Formula, Graph Coloring and Covering, Chromatic Number, Spanning Trees, Algorithms for Spanning Trees (Problems Only and Theorems without Proofs).

Text Books:

1. Foundation Mathematics for Computer Science, 1st Edition, John Vince, Springer,2015
2. Probability & Statistics,3rd Edition, Murray R. Spiegel, John J. Schiller and R. Alu Srinivasan, Schaum's Outline Series, Tata McGraw-HillPublishers,2018
3. Probability and Statistics with Reliability,2nd Edition,K.Trivedi,Wiley,2011
4. Discrete Mathematics and its Applications with Combinatorics and Graph Theory,7th Edition, H. Rosen, Tata McGraw Hill, 2003

Reference Books:

1. Probability and Computing: Randomized Algorithms and Probabilistic Analysis,1st Edition, M. Mitzenmacher and E. Upfal, 2005
2. Applied Combinatorics,6th Edition, Alan Tucker, Wiley, 2012

Web Resources:

1. https://archive.nptel.ac.in/courses/106/102/106102064/
2. https://ocw.mit.edu/courses/6-006-introduction-to-algorithms-spring-2020/video_galleries/lecture-videos/
3. https://www.cs.usfca.edu/~galles/visualization/Algorithms.html
4. https://visualgo.net/en
5. https://elearn.daffodilvarsity.edu.bd/course/view.php?id=11771

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MCA I Semester

L	T	P	C
0	0	3	1.5

DATABASE MANAGEMENT SYSTEMS LAB

Course Objectives:

This Course will enable students to

- Populate and query a database using SQL DDL/DML Commands.
- Declare and enforce integrity constraints on a database
- Writing Queries using advanced concepts of SQL
- Programming PL/SQL including procedures, functions, cursors and triggers

1. Execute all DDL, DML and DCL commands on sample tables.
2. Implementation of different types of operators and built-in functions with Suitable examples.
3. Implementation of different types of joins with suitable examples.
4. Create views, partitions, Sequences for a particular DB
5. Implement different types of constraints on relations.
6. Implementation of subqueries and nested queries.
7. Implement Queries on Group By& Having Clauses, ALIAS, Sequence By, Order By
8. Control Structure
   a) Write a PL/SQL block for Addition of Two Numbers
   b) Write a PL/SQL block for IF, IF and else condition
   c) Write a PL/SQL block for implementation of loops
   d) Write a PL/SQL block for greatest of three numbers using IF AND ELSEIF
9. Exception Handling- Implement the following with respect to exception handling. Raising Exceptions, User Defined Exceptions, Pre-Defined Exceptions
10. Procedures
    a) Write a PL/SQL Procedure using Positional Parameters
    b) Write a PL/SQL Procedure using notational parameters
    c) Write a PL/SQL Procedure for GCD Numbers
    d) Write a PL/SQL Procedures for cursor implementation (explicit and implicit cursors)
11. Functions:
    a) Write a PL/SQL block to implement factorial using functions
    b) Write a PL/SQL function to search an address from the given database
12. Write a DBMS program to prepare Pl/SQL reports for an application using functions.
13. Triggers:
    a) Write a Trigger to pop-up the DML operations
    b) Write a Trigger to check the age valid or not Using Message Alert.

V. Dinesh Babu

K. Sambi Reddy

c) Create a Trigger on a table so that it will update another table while inserting values

14. Write PL/SQL block for an application using cursors and all types of triggers.
15. Write a PL/SQL block for transaction operations of a typical application using package

Text Books / Suggested Readings:

1. Oracle: The Complete Reference by Oracle Press
2. Nilesh Shah, "Database Systems Using Oracle", PHI, 2007
3. Rick F Vander Lans, "Introduction to SQL", Fourth Edition, Pearson Education, 2007

Web Resources:

1. https://moodle.sit.ac.in/blog/database-management-system-lab-component-bcs403/#P01
2. https://elearn.daffodilvarsity.edu.bd/course/view.php?id=10250
3. https://cs50.harvard.edu/x/2024/weeks/7/
4. https://courses.cs.washington.edu/courses/cse414/17au/calendar/hwlist.html
5. http://db.lcs.mit.edu/6.5830/2021/assign.php

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MCA I Semester

L	T	P	C
0	0	4	2

DATA STRUCTURES USING C LAB

Course Objectives:

This Course will enable students to

- Design and implement various data structures.
- Implement operations like searching, insertion, and deletion, traversing mechanism
- Develop applications using data structure algorithms.

Experiment 1:

a) Write a program in C to display the n terms of even natural numbers and their sum.
b) Write a program in C to display the n terms of harmonic series and their sum. 1 + 1/2 + 1/3 + 1/4 + 1/5 ... 1/n terms.
c) Write a C program to check whether a given number is an Armstrong number or not
d) Write a C program to calculate the factorial of a given number.

Experiment 2:

a) Write a program in C for multiplication of two square Matrices.
b) Write a program in C to find the transpose of a given matrix.

Experiment 3:

a) Write a program in C to check whether a number is a prime number or not using the function.
b) Write a recursive program which computes the nth Fibonacci number, for appropriate values of n.
c) Write a program in C to add numbers using call by reference.

Experiment 4:

a) Write a program in C to append multiple lines at the end of a text file.
b) Write a program in C to copy a file in another name

Experiment 5:

Write recursive program for the following

a) Write recursive and non recursive C program for calculation of Factorial of an integer.
b) Write recursive and non recursive C program for calculation of GCD (n, m)

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c) Write recursive and non recursive C program for Towers of Hanoi: N disks are to be transferred from peg S to peg D with Peg I as the intermediate peg.

Experiment 6:

a) Write a C program that uses both recursive and non recursive functions to perform Linear search for a Key value in a given list.

b) Write a C program that uses both recursive and non recursive functions to perform Binary search for a Key value in a given list.

Experiment 7:

a) Write a C program that implements stack (its operations) using arrays.

b) Write a C program that implements stack (its operations) using Linke list.

Experiment 8:

a) Write a C program that uses Stack operations to convert infix expressions into postfix expressions.

a) Write a C program that implements Queue (its operations) using arrays.

b) Write a C program that implements Queue (its operations) using linked lists.

Experiment 9:

Write a C program that uses functions to create a singly linked list and perform various operations on it.

Experiment 10:

Write a C program to store a polynomial expression in memory using a linked list and perform polynomial addition.

Experiment 11:

a) Write a recursive C program for traversing a binary tree in preorder, in order and post order.

b) Write a non recursive C program for traversing a binary tree in preorder, in order and post order.

Experiment 12:

Implementation of Hash table using double hashing as collision resolution function.

Experiment 13:

Implementation of Binary Search trees- Insertion and deletion..

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Experiment 14:

Implementation of AVL Tree – Insertion and Deletion

Experiment 15:

a) Write a C program that implements Bubble sort, to sort a given list of integers in ascending order.

b) Write a C program that implements Quick sort, to sort a given list of integers in ascending order.

c) Write C program that implement Merge sort, to sort a given list of integers in ascending order

Web resources:

1. https://ds1-iiith.vlabs.ac.in/
2. https://profile.iiita.ac.in/bibhas.ghoshal/teaching_ds_lab.html
3. https://moodle.sit.ac.in/blog/data-structures-laboratory/
4. https://dsalab.netlify.app/
5. https://www.vtuloop.com/data-structure-lab-programs-all/

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MCA I Semester

L	T	P	C
0	0	3	1.5

OPERATING SYSTEMS AND LINUX LAB

Course Objectives:

This Course will enable students to implement CPU scheduling algorithms, Disk scheduling algorithms, Execute different types of Linux commands and Write shell scripts

List of Experiments:

UNIX Lab-Introduction to Unix

1. Study of Unix/Linux general purpose utility commands
2. Study of Bash shell, Bourne shell and C shell in Unix/Linux operating system .
3. Study of UNIX/LINUX File System(tree structure).
4. C program to emulate the UNIX ls –l command
5. C program that illustrates how to execute two commands concurrently with a command pipe. Ex: - ls –l | sort
6. Multiprogramming-Memory management-Implementation of fork (), wait (), exec() and exit (), System calls

Operating Systems Lab

1. Simulate the Following CPU Scheduling Algorithms
   A) FCFS B)SJF C)Priority D)Round Robin
2. Multiprogramming-Memory Management- Implementation of fork(), wait(), exec() and exit()
3. Simulate The Following
   a. Multiprogramming with A Fixed Number Of Tasks (MFT
   b. Multiprogramming with A Variable Number Of Tasks (MVT)
4. Write a program to implement first fit, best fit and worst fit algorithm for memory management.
5. Simulate Bankers Algorithm for Deadlock Avoidance
6. Simulate Bankers Algorithm for DeadLock Prevention.
7. Simulate The Following Page Replacement Algorithms.
   a) FIFO b) LRU c) LFU
8. Simulate the Following File Allocation Strategies
   a) Sequenced b) Indexed c) Linked

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Linux Lab

1. Write a Shell program to check whether a given number is prime or not.
2. Write a shell script which will display Fibonacci series up to the given range.
3. Write a shell script to check whether the given number is Armstrong or not.
4. Write a shell script to the calculate the value of
5. Write a shell script to accept student number, name, marks in 5 subjects.
6. Find total, average and grade using the following rules:
   Avg>=80 then grade A
   Avg<80 &&Avg>=70 then grade B
   Avg<70 &&Avg>=60 then grade C
   Avg<60 &&Avg>=50 then grade D
   Avg<50 &&Avg>=40 then grade E
7. Write a shell script to find minimum and maximum elements in the given list of elements.
8. Write a shell program to check whether the given string is palindrome or not.
9. Write an awk program to print sum, avg of students marks list
10. Write a shell script to compute no. of characters and words in each line of given file

Web Resources:

1. https://profile.iiita.ac.in/bibhas.ghoshal/teaching_os_lab.html
2. https://profile.iiita.ac.in/bibhas.ghoshal/OS_2019/teaching_os_lab.html
3. https://dextutor.com/courses/operating-system-programs/
4. https://oscourse.org/labs/
5. https://labex.io/courses/linux-practice-labs
6. https://www.101labs.net/courses/101-labs-linux-lpic1/

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MCA II Semester

L	T	P	C
3	0	0	3

COMPUTER NETWORKS

Course Objectives:

At the end of the course, the students will be able to:

- To Understand the fundamental concepts of computer networking and OSI Reference model.
- To Familiarize the student with the basic taxonomy and terminology of the computer networking area.
- To learn and understand the advanced networking concepts, preparing the student for entry advanced courses in computer networking.
- To develop and gain expertise in some specific areas of networking such as the design and maintenance of individual networks.

UNIT–I

Introduction: Network Topologies WAN, LAN, MAN. Reference models, The OSI Reference Model, the TCP/ IP Reference Model, A Comparison of the OSI and TCP/IP Reference Models. **Physical Layer:** Introduction to physical layer, Data and Signals, Periodic analog signals, digital signals, transmission impairment, Data rate limits, performance, Introduction to Guided Media, Twisted-pair cable, Coaxial cable and Fiber optic cable and Unguided media: Wireless-Radio waves, microwaves, infrared.

Unit-II

The Data Link Layer: Services Provided to the Network Layer, Framing, Error Control, Flow Control, Error Detection and Correction, Error-Correcting Codes, Error Detecting Codes. **Elementary Data Link Protocols:** Simplex Protocol, A Simplex Stop and Wait Protocol for an Error free channel, A Simplex Stop and Wait Protocol for a Noisy Channel, Sliding Window Protocols, A One Bit Sliding Window Protocol, Go-Back-N, Selective Repeat.

UNIT-III

The Medium Access Control Sublayer-The Channel Allocation Problem, Static Channel Allocation, Assumptions for Dynamic Channel Allocation, Multiple Access Protocols, Aloha, Pure aloha, slotted aloha, Carrier Sense Multiple Access Protocols, Collision-Free Protocols, Limited Contention Protocols. **Wireless LAN Protocols-** Ethernet, Classic Ethernet Physical Layer, Classic Ethernet MAC Sublayer Protocol, Ethernet Performance, Fast Ethernet, Wireless LANs, The 802.11 Architecture and Protocol Stack, 802.11 Physical Layer, 802.11 MAC Sublayer Protocol, 805.11 Frame Structure, Services.

M Babu Reddy V. Dinesh Babu K. Sambi Reddy

Unit-IV

The Network Layer Design Issues: Store and Forward Packet Switching, Services Provided to Transport layer, Implementation of Connection less Service, Implementation of Connection Oriented Service, Comparison of Virtual Circuit and Datagram Networks, Routing Algorithms, Optimality principle, Shortest path, Flooding, Distance vector, Link state, Hierarchical. **Congestion Control algorithms:** General principles of congestion control, Congestion prevention policies, Approaches to Congestion Control, Traffic Aware Routing, Admission Control, Traffic Throttling, Load Shedding. **Internet Working:** How networks differ, How networks can be connected, Tunneling, internetwork routing, Fragmentation, network layer in the internet, IP protocols, IPV4 protocol, IP addresses, Subnets, IP Version6- The main IPV6 header, Internet control protocols- ICMP, ARP, DHCP.

UNIT-V:

The Transport Layer: Transport layer protocols: Introduction, services, port number, User datagram protocol, User datagram, UDP services, UDP applications, Transmission control protocol: TCP services- TCP features- Segment- A TCP connection, windows in TCP, flow control, Error control. **Application Layer:** World Wide Web: HTTP, FTP, Two connections, control connection, Data connection, security of FTP, Electronic mail, Architecture, web based mail, email security, TELENET, local versus remote Logging. **Domain Name System:** Name Space, DNS in Internet, Resolution, Caching, Resource Records, DNS messages, Registrars, security of DNS Name Servers.

Text Books:

1. Computer Networks: Andrew S Tanenbaum David J. Wetherall, 5/e, Pearson
2. Data communications and networking: BehrouzForouzan, 5/e, McGraw Hill

Reference Books

1. Computer Networks – A System Approach, Peterson, Bruce Davie,2/e , Harcourt Asia
2. Compute communications and networking technologies, Gallo, Hancock, Cengage
3. An Engineering approach to compute networking, Kesha, Pearson

Web Resources:

1. https://onlinecourses.swayam2.ac.in/cec23_cs07/preview
2. https://onlinecourses.nptel.ac.in/noc21_cs18/preview
3. https://ocw.mit.edu/courses/6-829-computer-networks-fall-2002/pages/lecture-notes/
4. https://www.sanfoundry.com/computer-network-basics/
5. https://www.cisco.com/c/en_in/solutions/enterprise-networks/what-is-computer-networking.html
6. https://www.cs.vu.nl/~ast/CN5/

M Babu Reddy V. Dinesh Babu K. Sambi Reddy

MCA II Semester

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NETWORK SECURITY AND CYBER SECURITY

Course Objectives:

- To learn various cryptographic algorithms including secret key cryptography, hashes and message digests, public key algorithms,
- To Familiar in design issues and working principles of various authentication protocols and various secure communication standards
- To understand the cybercrime fundamentals and preventive steps

UNIT I:

Basic Principles: Security Goals, Cryptographic Attacks, Services and Mechanisms, Mathematics of Cryptography. Symmetric Encryption: Mathematics of Symmetric Key Cryptography, Introduction to Modern Symmetric Key Ciphers, Data Encryption Standard, Advanced Encryption Standard.

UNIT II:

Asymmetric Encryption: Mathematics of Asymmetric Key Cryptography-Primes, primality Testing, Factorization, Asymmetric Key Cryptography-RSA Cryptosystem, Rabin Cryptosystem, ElGamal Cryptosystem, Elliptic Curve Cryptosystem

Cryptographic Hash Functions: Applications of Cryptographic Hash Functions, Two Simple Hash Functions Requirements and Security Hash Functions Based on Cipher Block Chaining, Secure Hash Algorithm (SHA), SHA-3

UNIT III:

Digital Signatures: Elgamal Digital Signature Scheme, Schnorr Digital Signature, NIST Digital Signature Algorithm

Electronic Mail Security: Internet Mail Architecture, Email Formats, Email Threats and Comprehensive Email Security, S/MIME. IP Security: IP Security Policy, Encapsulating Security Payload, Combining Security Associations Internet Key Exchange

Unit IV:

Introduction to Cybercrime: Introduction, Cybercrime: Definition and Origins of the Word, Cybercrime and Information Security, Cybercriminals, Classifications of Cybercrime, Cyber stalking, Cyber cafe and Cybercrimes, Botnets. Attack Vector, Proliferation of Mobile and Wireless Devices, Security Challenges Posed by Mobile Devices, Attacks on Mobile/Cell Phones

M Babu Reddy V. Singh Babu K. Sambi Reddy

Unit V:

Proxy Servers and Anonymizers, Phishing, Password Cracking, Keyloggers and Spywares, Virus and Worms, Trojan Horses and Backdoors, Steganography, Sniffers, Spoofing, Session Hijacking Buffer overflow, DoS and DDoS Attacks, SQL Injection, Buffer Overflow, Attacks on Wireless Networks, Identify theft, FootPrinting and Social Engineering, Port Scanning, EMailInvestigation, E-Mail Tracking, IP Tracking, EMail Recovery, Password Cracking,

Text Books:

1. Cryptography and Network Security, 3rd Edition Behrouz A Forouzan, Deb deep Mukhopadhyay, McGraw Hill,2015
2. Sunit Belapure Nina Godbole "Cyber Security: Understanding Cyber Crimes, Computer Forensics and Legal Perspectives", WILEY, 2011.

Reference Books:

1. Network Security and Cryptography, First Edition, Bernard Meneges, Cengage Learning, 2018
2. Cryptography and Network Security, William Stallings, Global Edition, 7e Pearson, 2017

Web Resources:

1. https://archive.nptel.ac.in/courses/106/105/106105162/
2. https://ebooks.inflibnet.ac.in/csp11/chapter/introduction-to-network-security/
3. https://www.fortinet.com/resources/cyberglossary/what-is-cryptography
4. https://ischoolonline.berkeley.edu/cybersecurity/curriculum/cryptography/
5. https://www.mitel.com/articles/web-communication-cryptography-and-network-security
6. https://www.nist.gov/cybersecurity
7. https://www.codecademy.com/learn/introduction-to-cybersecurity

M Babu Reddy V. Dinesh Babu. K. Sambi Reddy

MCA II Semester

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OBJECT ORIENTED PROGRAMMING USING JAVA

Course Objectives:

- To understand the basic concepts of object oriented programming concepts.
- To introduce the principles of inheritance and polymorphism and demonstrate how they are related to the design of abstract classes
- To understand the implementation of packages and interfaces
- To introduce the concept of multithreading and exception handling
- To learn and understand the design of Graphical User Interface using swing controls

UNIT–I:

Basics of Object Oriented Programming (OOP): Need for OO paradigm , A way of viewing world- Agents, responsibility, messages, methods, classes and instances, class hierarchies (Inheritance), method binding, overriding and exceptions, summary of OOP concepts, coping with complexity, abstraction mechanisms. **Java Basics:** Data types, variables, scope and lifetime of variables, arrays, operators, expressions, control statements, type conversion and costing, simple java program, classes and objects-concepts of classes, objects, constructors methods, access control, this keyword, garbage collection, overloading methods and constructors, parameter passing, recursion, string handling.

UNIT–II:

Inheritance: Hierarchical abstractions, Base class object, subclass, subtype, substitutability, forms of inheritance- specialization, specification, construction, extension, limitation, combination, benefits of inheritance costs of inheritance. Member access rules, super uses, using final with inheritance, polymorphism, abstract classes.**Packages and Interfaces:** Defining, Creating and Accessing a package, Understanding CLASSPATH, Importing packages, differences between classes and interfaces, defining an interface, Implementing interface, applying interfaces variables in interface and extending interfaces.

UNIT–III:

Exception handling and Multithreading: Concepts of exception handling, benefits of exception handling, Termination or resumptive models, exception hierarchy, usage of try, catch, throws and finally, built in exceptions, creating own exception subclasses. Differences between multithreading and multitasking, thread lifecycle, creating threads, synchronizing threads, daemon threads, thread groups.

M Babu Reddy V. Dinesh Babu. K. Sambi Reddy

UNIT–IV:

Event Handling: Events, Event sources, Event classes, Event Listeners, Delegation event model, handling mouse and keyboard events, Adapter classes, inner classes. The AWT class hierarchy, user-interface components- labels, button, canvas, scrollbars, text components, check box, checkbox groups, choices, list panes, scroll pane, dialogs, menu bar, graphics, layout manager, layout manager types- boarder, grid, flow, card and grid bag.

UNIT-V:

Swings: Introduction, limitations of AWT, MVC architecture, components, containers, exploring swing- JFrame and JComponent, Icons and Labels, text fields, buttons-The JButton class, Check boxes, Radio Buttons, ComboboxssTabbed Tabbed panes, Scroll panes, Trees and Tables

Text Books:

1. Java-The Complete Reference,7/e, Herbert schildt, TMH

Reference Books:

1. JAVA: How to program,8/e, Dietal, Dietal, PHI
2. Introduction of programming with JAVA, S.Dean, TMH
3. Introduction to JAVA programming, 6/e, Y.Daniel Liang, Pearson
4. Core Java2, Vol1(Vol2) Fundamentals (Advanced),7/e, Cay.S.Horstmann, Gary Cornell, Pearson
5. Big Java 2,3/e, Cay.S.Horstmann,Wiley
6. Object Oriented Programming through Java, P.Radha Krishna, University Press

Web resources:

1. https://onlinecourses.nptel.ac.in/noc20_cs58/preview
2. https://www.iitk.ac.in/esc101/05Aug/tutorial/information/resources.html
3. https://docs.oracle.com/javase/tutorial/index.html
4. https://www.javacodegeeks.com/best-java-programming-resources

M Babu Reddy V. Dinesh Babu K. Sambi Reddy

MCA II Semester

SOFTWARE ENGINEERING

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L	T	P	C
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Course Objectives:

- To understand the nature of software development and software life cycle models.
- To understand methods of capturing, specifying, visualizing and analyzing software requirements.
- To know the basics of testing and understanding the concept of software quality assurance and software configuration management process.
- To learn to provide correctness proofs for algorithms.

UNIT–I:

Introduction: Software Engineering and its history, Software crisis, Evolving of a Programming System Product, Characteristics of Software, Brooks' No Silver Bullet, and Software Myths. **Software Development Life Cycles :** Software Development Process, Code-and-Fix model, Waterfall model, Evolutionary Model, Incremental Implementation, Prototyping, Spiral Model, Software Reuse, Critical Comparisons of SDLC models. **An Introduction to Non-Traditional Software Development Process:** Rational Unified Process, Rapid Application Development, Agile Development Process-Introduction, Agile- SCRUM(Sprint, Review, Retrospective, Planning) , XP, KANBAN, SAFE agile

UNIT–II:

Requirements: Importance of Requirement Analysis, User needs, Software Features and Software Requirements. **Classes of User Requirements:** Enduring and Volatile, Sub phases of Requirement Analysis, Functional and Non-functional requirements, Barriers to Eliciting User requirements, The software requirements document and SRS standards, Requirements Engineering, Case Study of SRS for a Real Time System. **Tools for Requirements Gathering:** Document Flow Chart, Decision Table, Decision Tree, Introduction to non-traditional Requirements.

UNIT-III:

Software Design: Goals of good software design, Design strategies and methodologies, Data oriented software design. **Structured Design:** Structure chart, Coupling, Cohesion, Modular structure, Packaging, Object oriented design, Top-down and bottom-up approach, Design patterns. **Structured Analysis:** DFD, Data Dictionary, Software Measurement and Metrics: Various Size Oriented Measures: Halstead's software science, Function Point (FP) based measures, Cyclomatic Complexity Measures: Control flow graphs Development: Selecting a language, Coding guidelines,

M Babu Reddy V. Dinesh Babu K. Sambi Reddy

Writing code, Code documentation.

UNIT–IV:

Software Testing : Testing process, Design of test cases, Functional Testing : Boundary value analysis, Equivalence class testing, Decision table testing, Cause effect graphing, Structural testing, Path testing, Data flow and mutation testing, Unit testing, Integration and system testing, Debugging, Alpha & beta testing, testing tools & standards.

UNIT-V:

Software Maintenance: Management of maintenance, Maintenance process, Maintenance models, Regression testing, Reverse engineering, Software reengineering, Configuration management, documentation.

Text Books:

1. Software Engineering: A Practitioner's Approach, R. S. Pressman, McGraw Hill, 9thEdition, Sept 2019

Reference Books:

1. Software Engineering K.K.Aggarwal, Yogesh Singh, New Age International Publishers, Third Edition, 2007
2. Software Engineering, Ian Sommerville, Addison Welsley, 9th Edition, 2010.
3. An Integrated Approach to Software Engineering, PankajJalote, Narosa Publishing House, 3rdEdition, 2007

Web Resources:

1. https://onlinecourses.nptel.ac.in/noc23_cs122/preview
2. https://nptelvideos.com/course.php?id=444
3. https://softengbook.org/
4. https://www.coursera.org/learn/introduction-to-software-engineering?msockid=39a584c9c8ac6773281697f5c91e6633

M Babu Reddy V. Dinesh Babu K. Sambi Reddy

MCA II Semester

L	T	P	C
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ARTIFICIAL INTELLIGENCE

Course Objectives:

- To learn the basic State space representation. Intelligent Systems Categorization of Intelligent concepts and techniques of AI and machine learning
- To explore the various mechanisms of Knowledge and Reasoning used for building an expert system.
- To become familiar with supervised and unsupervised learning models
- To design and develop AI and machine learning solutions using modern tools.

UNIT–I

Introduction to AI: Definition, Problem, System, Components of AI Program, Foundations of AI, Applications of AI, Current trends in AI, Intelligent Agents: Anatomy, structure, Types.

UNIT–II

Problem solving- Solving problems by Searching: Problem Solving Agent, Formulating Problems. Uninformed Search Methods: Breadth First Search (BFS), Depth First Search (DFS), Depth First Iterative Deepening (DFID), Informed Search Methods-Greedy best first Search, A* Search, Memory bounded heuristic Search. Local Search Algorithms and Optimization Problems- Hill climbing search Simulated annealing and local beam search.

UNIT –III

Knowledge and Reasoning-Knowledge based Agents, The Wumpus World, and Propositional logic. **First Order Logic** –Syntax and Semantic, Inference in FOL, Forward chaining, backward Chaining, Knowledge Engineering in First-Order Logic, Unification and Resolution.

UNIT–IV

Agents: Definition of agents, Agent architectures (e.g., reactive, layered, cognitive), Multi-agent systems- Collaborating agents, Competitive agents, Swarm systems and biologically inspired models. Expert Systems: Representing and Using Domain Knowledge, Expert System Shells, Explanation, Knowledge Acquisition.

UNIT–V

Expert Systems: Architecture of expert systems, Roles of expert systems, Knowledge Acquisition, Meta knowledge, Heuristics. Expert systems- MYCIN, DART, XOON, Expert systems shells.

M Babu Reddy V. Dinesh Babu K. Sambi Reddy

Text Books:

1. Artificial Intelligence, Sarojkaushik, Cengage Learning India, 2011
2. Artificial Intelligence and Machine Learning, Vinod Chandra S.S., Anand Hareendran S
3. Stuart J.Russell and Peter Norvig, "Artificial Intelligence: A Modern Approach" Second Edition, Pearson.

Reference Books:

1. Ivan Bratko "PROLOG Programming for Artificial Intelligence", Pearson Education, Third Edition.
2. Elaine Rich and Kevin Knight "Artificial Intelligence ", Third Edition
3. Han Kamber, "Data Mining Concepts and Techniques", Morgan Kaufmann Publishers
4. G. Luger, W. A. Stubblefield, "Artificial Intelligence", Third Edition, AddisoWesley Longman, 1998

Web Resources:

1. https://onlinecourses.nptel.ac.in/noc22_cs56/preview
2. https://openlearning.mit.edu/news/explore-world-artificial-intelligence-online-courses-mit
3. https://cse.iitk.ac.in/users/cs365/2015/resources.html
4. https://microsoft.github.io/AI-For-Beginners/
5. https://artint.info/3e/resources/index.html
6. https://web.dev/explore/ai

M Babu Reddy V. Dinesh Babu K. Sambi Reddy

MCA II Semester

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DESIGN AND ANALYSIS OF ALGORITHMS

Course Objectives:

- To analyze the asymptotic performance of algorithms.
- To understand and write rigorous correctness proofs for algorithms.
- To familiarity with major algorithms and data structures.
- Apply important algorithmic design paradigms and methods of analysis.
- Synthesize efficient algorithms in common engineering design situations.

UNIT-I:

Introduction: Algorithm, Pseudo code for expressing algorithms, performance Analysis-Space complexity, Time complexity, Asymptotic Notation- Big oh notation, Omega notation, Theta notation and Little oh notation, probabilistic analysis, Amortized analysis. Disjoint Sets- disjoint set operations, union and find algorithms, spanning trees, connected components and bi- connected components.

UNIT-II:

Divide and conquer: General method, applications-Binary search, Quick sort, Merge sort, Stassen's matrix multiplication. Greedy method: General method, applications-Job sequencing with deadlines, 0/1 knapsack problem, Minimum cost spanning trees, Single source shortest path problem.

UNIT-III:

Dynamic Programming: General method, applications-Matrix chain multiplication, Optimal binary search trees, 0/1 knapsack problem, All pairs shortest path problem, Traveling salesperson problem, Reliability design.

UNIT-IV:

Backtracking: General method, applications-n-queen problem, sum of subsets problem, graph coloring, Hamiltonian cycles.

UNIT-V:

Branch and Bound: General method, applications - Travelling salesperson problem, 0/1 knapsack problem-LC Branch and Bound solution, FIFO Branch and Bound solution. NP-Hard and NP-Complete problems: Basic concepts, non-deterministic algorithms, NP - Hard and NP Complete classes, Cook's theorem.

M Babu Reddy V. Dinesh Babu K. Sambi Reddy

Text Books:

1. Fundamentals of Computer Algorithms, Ellis Horowitz, SatrajSahni and Rajasekaran, Universities Press
2. The Algorithm Design Manual, 2nd edition, Steven S. Skiena, Springer
3. Introduction to Algorithms, second edition, T.H. Cormen, C.E. Leiserson, R.L. Rivest and C.Stein, PHI Pvt. Ltd

Reference Books:

1. Introduction to the Design and Analysis of Algorithms, AnanyLevitin, PEA
2. Design and Analysis of Algorithms, Pearson Education, ParagHimanshu Dave, HimansuBalachandra Dave
3. Introduction to Design and Analysis of Algorithms A strategic approach, R.C.T. Lee, S.S.Tseng, R.C.Chang and T.Tsai, Mcgraw Hill
4. Design and Analysis of algorithms, Pearson education, Aho, Ullman and Hopcroft

Web Resources:

1. https://nptel.ac.in/courses/106106131
2. http://openclassroom.stanford.edu/MainFolder/CoursePage.php?course=IntroToAlgorithms
3. https://ocw.mit.edu/courses/6-046j-design-and-analysis-of- algorithms-spring-2015/resources/lecture-notes/
4. https://ocw.mit.edu/courses/6-046j-design-and-analysis-of- algorithms-spring-2015/resources/lecture-notes/
5. https://aofa.cs.princeton.edu/home/

M. Babu Reddy V. Dinesh Babu K. Sambi Reddy

MCA II Semester

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ADVANCED UNIX PROGRAMMING

Course Objectives:

- To understand the fundamental design of the unix Programming
- To become fluent with the systems calls provided in the unix environment
- To be able to design and build an application/service over the unix operating system

UNIT-I:

Review of Unix Utilities and Shell Programming:-File handling utilities, security by file permissions, process utilities, disk utilities, networking commands, backup utilities, text processing utilities. **Shell Programming:** shell, shell responsibilities, pipes and input redirection, output redirection, here documents, the shell as a programming la guage, shell metacharacters, shell variables, shell commands, the environment, control structures, shell script examples.

UNIT-II:

Unix Files: Unix file structure, directories, files and devices, System calls, library functions, low level file access, usage of open, create, read, write, close, lseek, stat, fstat, octl, umask, dup, dup2, Differences between system call and library functions. File and directory maintenance: chmod, chown, unlink, link, symlink, mkdir, rmdir, chdir, getcwd. **Directory handling system calls:** opendir, readdir, closedir, rewinddir, seekdir, telldir

UNIT-III:

Unix Process: Threads and Signals: process, process structure, starting new process, waiting for a process, zombie process, orphan process, process control, process identifiers, system call interface for process management, - fork, vfork, exit, wait, waitpid, exec, system. **Signals**: Signal functions, unreliable signals, interrupted system calls, kill and raise functions, alarm, pause functions, abort, sleep functions.

UNIT-IV:

Inter process Communication: Introduction to IPC, IPC between processes on a single computer system, IPC between processes on different systems, pipes, FIFOs, message queues, semaphores and shared memory. Differences between pipes and FIFOs.Implementing a client server program using pipes and FIFOs.**Message Queues-**:IPC, permission issues, Access permission modes, message structure, working with message queues, client/server example. **Semaphores:** Creating semaphore sets, Unix kernel support for semaphores, Unix APIs for semaphores, file locking using semaphores.

M. Babu Reddy V. Dinesh Babu K. Sambi Reddy

UNIT-V

Shared Memory: Working with shared memory segments, Unix kernel support for shared memory, client/server example.

Sockets: Berkeley sockets, socket structure, socket system calls for connection oriented protocol and connectionless protocol, implementing client server programs using TCP and UDP sockets.

Text Books:

1. Advanced programming in the unix environment, w- RichardStevens, 2nd Edition Pearson education
2. Unix Concepts and Applications, 3/e, Sumitabha Das, TMH

Reference Books:

1. Unix and shell Programming, Sumitabha Das, TMH
2. A Beginner's Guide to Unix, N.P.Gopalan, B.SivaSelva, PHI
3. Unix Shell Programming, Stephen G.Kochan, Patrick Wood,
4. Unix Shell Programming, Lowell Jay Arthus& Ted Burns,3/e,GalGotia

Web Resources:

1. https://archive.nptel.ac.in/courses/117/106/117106113/
2. https://stevens.netmeister.org/631/
3. https://www.cs.fsu.edu/~asriniva/courses/aup02/lectures.html

M.Babu Reddy V. Dinesh Babu K. Sambi Reddy

MCA II Semester

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DATA WAREHOUSING AND DATA MINING

Course Objectives:

- Be familiar with mathematical foundations of data mining tools..
- Understand and implement classical models and algorithms in data warehouses and data mining
- Characterize the kinds of patterns that can be discovered by association rule mining, classification and clustering.
- Develop skill in selecting the appropriate data mining algorithm for solving practical problems.

UNIT-1:

Introduction to Data mining, types of Data, Data Quality, Data Processing, Measures of Similarity and Dissimilarity, Exploring Data: Data Set, Summary Statistics, Visualization, Data Warehouse, OLAP and multidimensional data analysis.

UNIT-II:

Classification: Basic Concepts, Decision Trees and model evaluation: General approach for solving a classification problem, Decision Tree induction, Model overfitting: due to presence of noise, due to lack of representation samples, Evaluating the performance of classifier. Nearest Neighbor classifier, Bayesian Classifier, Support vector Machines: Linear SVM, Separable and Non Separable case.

UNIT-III:

Association Analysis: Problem Definition, Frequent Item-set generation, rule generation, compact representation of frequent item sets, FP-Growth Algorithms. Handling Categorical, Continuous attributes, Concept hierarchy, Sequential, Subgraph patterns

UNIT-IV:

Clustering: Overview, K-means, Agglomerative Hierarchical clustering, DBSCAN, Cluster evaluation: overview, Unsupervised Cluster Evaluation using cohesion and separation, using proximity matrix, Scalable Clustering algorithm

UNIT-V:

Web data mining: Introduction, Web terminology and characteristics, Web co tent mining,

M. Babu Reddy V. Dinesh Babu K. Sambi Reddy

Web usage mining, web structure mining, Search Engines: Characteristics, Functionality, Architecture, Ranking of Web Pages, Enterprise search

Text Books:

1. Introduction to Data Mining, Tan, Steinbach and Vipin Kumar,Pearson Education, 2016
2. Data Mining: Concepts and Techniques, 2nd Edition, Jiawei Han andMichelineKamber, ELSEVIER
3. Data Mining, VikramPudi and P Radha Krishna, Oxford UniversityPress

Reference Books:

1. DataMining: TheTextbook,Springer,May2015,CharuC.Aggarwal.

Web resources:

1. https://nptel.ac.in/courses/106/105/106105174/
2. https://www.saedsayad.com/data_mining.htm
3. https://ocw.mit.edu/courses/15-062-data-mining-spring-2003/pages/lecture- notes/
4. https://www2.cs.uh.edu/~arjun/courses/dm/
5. https://www.rdatamining.com/resources/online-documents-books-and- tutorials
6. https://dataminingbook.info/book_html/

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MCA II Semester

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OBJECT ORIENTED PROGRAMMING USING JAVA LAB

Course Objectives:

- To understand how to design, implement, test, debug, and document programs that use basic data types and computation, simple I/O, conditional and control structures, string handling and functions.
- To understand the importance of Classes & objects along with constructors, Arrays and Vectors.
- Discuss the principles of inheritance, interface and packages and demonstrate through problem analysis assignments how they relate to the design of methods, abstract classes and interfaces and packages.
- To understand the importance of Multi-threading & different exception handling mechanisms.
- To learn experience of designing, implementing, testing, and debugging graphical user interfaces in Java using applet and AWT that respond to different user events.
- To understand Java Swings for designing GUI applications based on MVC architecture

List of Experiments:

1. The Fibonacci sequence is defined by the following rule. The first 2 values in the sequence are 1, 1. Every subsequent value is the sum of the 2 values preceding it. Write a Java Program that uses both recursive and non recursive functions to print the nth value of the Fibonacci sequence.
2. Write a Java Program that prompts the user for an integer and then prints out all the prime numbers up to that Integer.
3. Write a Java Program that checks whether a given string is a palindrome or not. Ex. MALAYALAM is a palindrome
4. Write a Java Program for sorting a given list of names in ascending order.
5. Write a Java Program that illustrates how runtime polymorphism is achieved.
6. Write a Java Program to create and demonstrate packages.
7. Write a Java Program, using StringTokenizer class, which reads a line of integers and then displays each integer and the sum of all integers.
8. Write a Java Program that reads a file name form the user then displays information about whether the file exists, whether the file is readable/ writable, the type of file and the length of the file in bytes and display the contents using File Input Stream class.
9. Write a Java Program that displays the number of characters, lines and

M Babu Reddy V. Dinesh Babu K. Sambi Reddy

and words in a text/text file.

10. Write a Java Program that works as a simple calculator. Use a grid layout to arrange buttons for the digits and for the +-*?% operations. Add a text field to display the result.
11. Write a Java Program for handling mouse events.
12. Write a Java Program demonstrating the life cycle of a thread.
13. Write a Java Program that lets users create Pie charts. Design your own user interface (with Swings & AWT).
14. Write a Java Program to implement a Queue, using user defined Exception Handling (also make use of throw, throws).

Web Resources:

1. https://www.iitk.ac.in/esc101/05Aug/tutorial/information/resources.html
2. https://labex.io/skilltrees/java
3. https://docs.oracle.com/javase/tutorial/index.html
4. https://introcs.cs.princeton.edu/java/home/

K. Sambi Reddy V. Dinesh Babu M Babu Reddy

MCA II Semester

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NETWORKS AND SECURITY LAB

Course Objectives:

- To learn basic understanding of cryptography, how it has evolved, and some key encryption techniques used today..
- To understand and implement encryption and decryption using Caesar Cipher, Substitution Cipher, Hill Cipher.

List of Experiments:

1. Implement the data link layer farming methods such as character stuffing and bit stuffing.
2. Implement on a data set of characters the three CRC polynomial – CRC12, CRC 16 and CRC CCIP.
3. Implement Dijkstra's algorithm to compute the Shortest path thru a graph.
4. Take an example subnet graph with weights indicating delay between nodes. Now obtain Routing table art each node using distance vector routing algorithm
5. Take an example subnet of hosts. Obtain a broadcast tree for it.
6. Write a C program that contains a string (char pointer) with a value 'Hello World'. The program should XOR each character in this string with 0 and display the result.
7. Write a C program that contains a string (char pointer) with a value 'Hello World'. The program should AND or and XOR each character in this string with 127 and display the result
8. Write a Java program to perform encryption and decryption using the following algorithms:
    a) Caesar Cipher
    b) Substitution Cipher
    c) Hill Cipher
9. Write a Java program to implement the DES algorithm logic
10. Write a C/JAVA program to implement the BlowFish algorithm logic
11. Write a C/JAVA program to implement the Rijndael algorithm logic.
12. Using Java Cryptography, encrypt the text "Hello world" using BlowFish.
13. Create your own key using Java key tool.
    a) Write a Java program to implement RSA Algorithm

M Babu Reddy V. Dinesh Babu K. Sambi Reddy

b) Write a Java program to implement Public key Algorithm like El Gamal

c) Implement the Diffie-Hellman Key Exchange mechanism using HTML

Web Resources:

1. https://csrc.nist.rip/publications/nistpubs/800-12/800-12-html/chapter19.html
2. http://vlabs.iitkgp.ac.in/ant/
3. https://networklessons.com/labs/network-fundamentals-lab-1
4. https://elearn.daffodilvarsity.edu.bd/course/view.php?id=10230
5. https://www.cybrary.it/practice-lab/cryptography-basics
6. https://www.infosecinstitute.com/resources/cryptography/cryptographic-algorithms-lab/

V. Dinesh Babu

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M Babu Reddy

MCA II Semester

L	T	P	C
1	0	0	0

EMPLOYABILITY SKILLS-I

UNIT – I:

1. Analytical Thinking & Listening Skills: Self-Introduction, Shaping Young Minds - A Talk by AzimPremji (Listening Activity), Self – Analysis, Developing Positive Attitude, Perception.

2. Communication Skills: Verbal Communication; Non Verbal Communication (Body Language)

UNIT – II:

1. Self-Management Skills: Anger Management, Stress Management, Time Management, Six Thinking Hats, Team Building, Leadership Qualities

2. Etiquette: Social Etiquette, Business Etiquette, Telephone Etiquette, Dining Etiquette

UNIT – III:

3. Standard Operation Methods: Note Making, Note Taking, Minutes Preparation, Email & Letter Writing

4. Verbal Ability: Synonyms, Antonyms, One Word Substitutes-Correction of Sentences-Analogies, Spotting Errors, Sentence Completion, Course of Action - Sentences Assumptions, Sentence Arguments, Reading Comprehension, Practice work

UNIT-IV:

5. Job-Oriented Skills –I: Group Discussion, Mock Group Discussions

UNIT-V:

6. Job-Oriented Skills –II: Resume Preparation, Interview Skills, Mock Interviews

Text books and Reference books:

1. Barun K. Mitra, Personality Development and Soft Skills, Oxford University Press, 2011.
2. S.P. Dhanavel, English and Soft Skills, Orient Blackswan, 2010.
3. R.S.Aggarwal, A Modern Approach to Verbal & Non-Verbal Reasoning, S.Chand& Company Ltd., 2018.
4. Raman, Meenakshi& Sharma, Sangeeta, Technical Communication Principles and Practice, Oxford University Press, 2011.

Web References:

1. www. Indiabix.com
2. www.freshersworld.com

M Babu Reddy V. Dinesh Babu K. Sambi Reddy

MALINENI LAKSHMAIAH WOMEN'S ENGINEERING COLLEGE (AUTONOMOUS)

(Accredited by "NBA" &"NAAC" with A+ Grade | Approved by AICTE, New Delhi & Affiliated to JNTUK, Kakinada)
Pulladigunta (Vil), Vatticherukuru (Md), Prathipadu Road, Guntur – 522 017 A.P.

II Board of Studies (BoS) Meeting - Honorarium Details – External Members A.Y.: 2024-25

Name of the Department : **Master of Computer Applications**

Date and Time of the BoS Meeting : **11-09-2024 11:30 a.m.**

Sr.No	Position in the BoS (UniversityNominee/ Subject experts fromoutsidethecollege/ Representative fromIndustry)	Name of the member	Designation	Address	Phone No.	E-Mail	Bank A/c No.	IFSC Code	Bank and Branch	Honorarium in Rs.
1	University Nominee	Dr D.Haritha	Professor in CSE	UCEK, JNTU Kakinada	9440810901	harithadasari9@yahoo.com harithadasari@jntuk.ac.in	---	----	----	10,000
2	Subject Expert from outside the parent University	Dr. M.Babu Reddy	Assoc. Professor	Department of Computer Science, KU.	9963436460	m_babureddy@yahoo.com principal.kru.ac.in	30396157526	SBIN0021828	SBI Krishna University Branch, Rudravaram, Machilipatnam	7,000
3	Subject Expert from outside the parent University	Dr. V.Denish Kumar	Professor	Dept. of CSE, RVIT	9014098028	dineshbabuunnava@gmail.com vdinesh@chec.ac.in	0411985583	KKBK0007748	Kotak Mahindra Bank, Vidyanagar, Guntur	5,000
4	Representative from Industry	Mr. K.Sambi Reddy	Sr.DBA	Sequential Technology International Pvt.Ltd., Hyderabad	9491583104	sambireddy.kalli@gmail.com	924010018553060	UTIB0003175	Axis Bank, Sainikpuri	5,000

Signature of the BoS Chairperson

Signature of the Principal

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WOMEN'S ENGINEERING COLLEGE
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Department of **Master of Computer Applications**
Minutes of the Board of Studies (BoS) Meeting

The Second BoS meeting of Master of Computer Applications Department was conducted on **25-07-2024** from **10:00 a.m** through virtual mode via Zoom Online Meeting Platform.

Members Present :

S.No.	Members	Name & Designation	Status of Attendance	Signature
1	Chairperson	Dr P. Ramesh Babu HoD of MCA, MLEW	PRESENT	
2	University Nominee	Dr D. Haritha Professor of CSE, UCEK, JNTU Kakinada Ph: 9440810901 Email : harithadasari9@yahoo.com harithadasari@jntucek.ac.in	PRESENT	
3	Subject expert from outside the parent University	1. Dr.M.Babu Reddy Assoc. Professor, Department of Computer Science, KU Ph: 9963436460 Email:m_babureddy@yahoo.com principal.krucet@kru.ac.in	PRESENT	
		2. Dr. V. Denish Kumar HoD, Professor, Dept.of CSE, RVIT Ph: 9014098028 Email: dineshbabuvunnava@gmail.com	PRESENT	
5	Representative from Industry	K Sambi Reddy Sr. DBA, Sequential Technology International Pvt.Ltd., Hyderabad Ph: 9491583104 Email: sambireddy.kalli@gmail.com	PRESENT	

6	Alumni Member	********** ********** Ph: Email:	NA	
7	Member	Mr. K.Umamaheswara Rao Assoc. Prof, MLEW	PRESENT	
8	Member	Mrs. Y.Naga Padmaja Assoc. Prof, MLEW	PRESENT	
9	Member	Mrs. K.Mounika Asst. Prof, MLEW	PRESENT	

Meeting Agenda:

Item No: 1

Discussion on Academic Regulations MR-23

Item No: 2

Discussion on Proposed Course Structure of 2nd Year MCA.

Item No: 3

Discussion on Proposed Syllabus of Courses Offered by Department Courses in 2nd Year MCA

Item No: 4

Any Other Points raised by BoS Members with the permission of chair.

Resolutions:

Item No : 1 - Discussion on Academic Regulations MR-23

At the onset, the Chairperson of BoS members, **Dr P.Ramesh Babu** welcomed all the members and introduced internal BoS members to external BoS members. The meeting began with presentation of proposed Academic Regulations MR23, all all the members are agreed for the same.

Academic Regulations MR23 of MCA are attached herewith.

Item No : 2 - Discussion on Proposed Course Structure of 2nd MCA Sem -III & Sem -IV and Ratification of the same.

Proposed Course Structure offered by the Department of MCA is presented before the BoS Members and asked for the modifications if any, and it is ratified by all the members.

Course Structure:

SEMESTER–WISE COURSE STRUCTURE

III Semester

S.No	Course Code	Courses	Category	L	T	P	Credits
1	23MCA3T01	Machine Learning with Python	PC	3	0	0	3
2	23MCA3T02	Internet of Things	PC	3	0	0	3
3	23MCA3T03	Web Technologies	PC	3	0	0	3
4	23MCA3T04	Cryptography and Network Security	PC	3	0	0	3
5	23MCA3E01 23MCA3E02 23MCA3E03 23MCA3E04 23MCA3E05	**Elective-II** • Soft Computing • Software Project Management • Cloud Computing • Optimization Techniques • Cyber Security	PE	3	0	0	3
6	23MCA3L01	Machine Learning with Python Lab	PC	0	0	3	1.5
7	23MCA3L02	IoT Lab	PC	0	0	3	1.5
8	23MCA3L03	Web Technologies Lab	PC	0	0	4	2
9	23MCA3P01	Internship / Industry Oriented Mini Project/ Skill Development Course (Minimum 6-weeks)	PR	0	0	0	2
			Total	**15**	**0**	**10**	**22**

IV Semester

S.No	Course Code	Courses	Category	L	T	P	Credits
1	23MCA4E01 23MCA4E02 23MCA4E03 23MCA4E04 23MCA4E05	Elective-III * • Digital Marketing • Human Resource Management • Deep Learning • Ad-hoc and Sensor Networks • MOOCs-1 (NPTEL/SWAYAM) - Full Stack Technologies - Any recommended course	PE	3	0	0	3
2	23MCA4E06 23MCA4E07 23MCA4E08 23MCA4E09 23MCA4E10	Elective-IV * • Network Programming • Block Chain technologies • Software Testing Methodologies • Big Data Analytics • MOOCs-2 (NPTEL/SWAYAM) -Data Science -Any recommended course	PE	3	0	0	3
3	23MCA4P01	Project Work/ Dissertation	PR	0	0	0	12
			Total	**6**	**0**	**0**	**18**

Item No : 3 - Discussion on Proposed Syllabus of Courses Offered by Department in II-Year MCA i.e., III Sem & IV Sem.

The Chairperson gave a presentation regarding the proposed course syllabi. All the members are approved the syllabus presented.

And the approved syllabus is attached herewith.

Item No : 4 Any Other Points raised by BoS Members with the permission of chair.

1. **Discussed about supplementary examinations for MCA.**

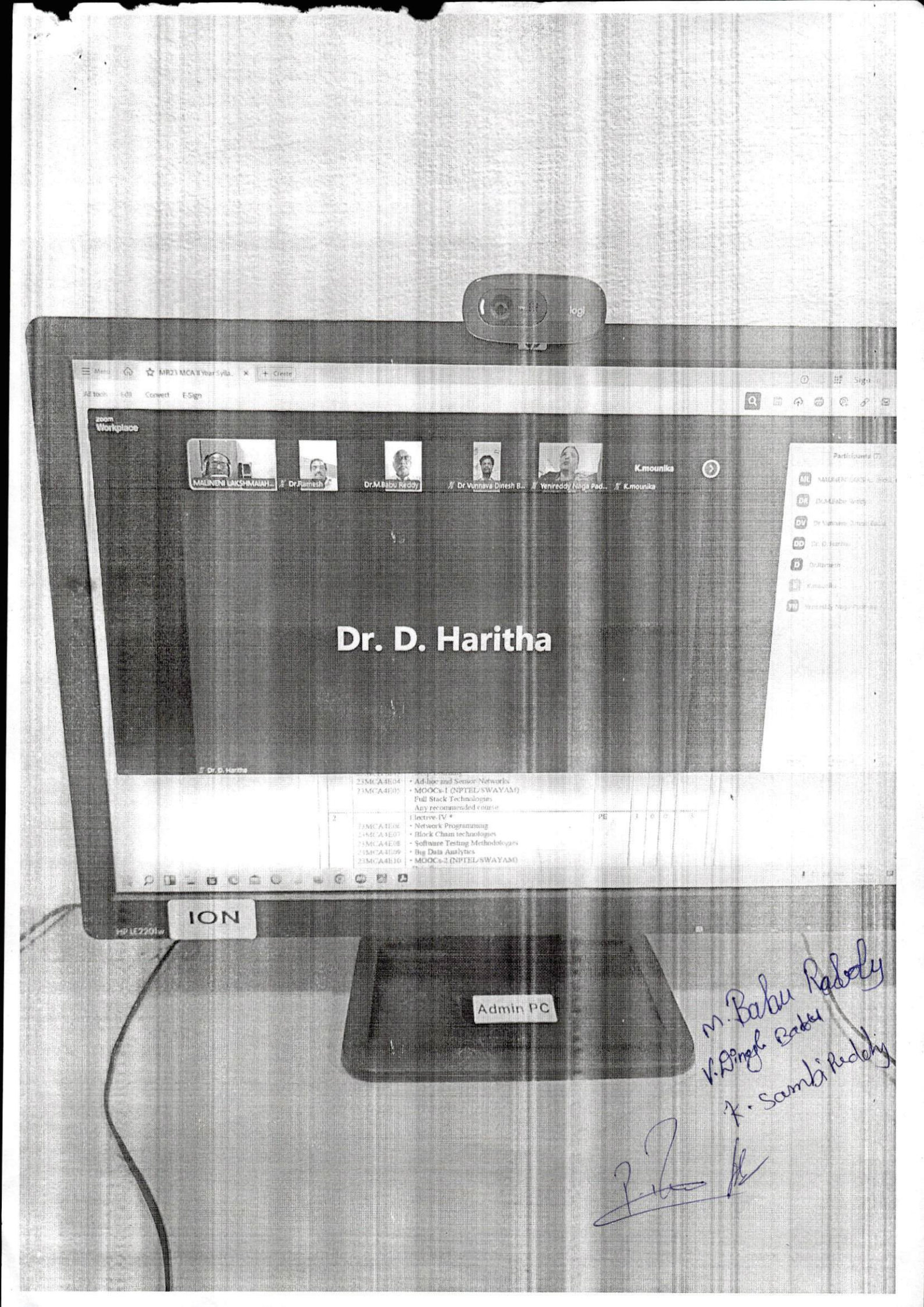
University Nominee suggested that , supplementary examinations could be conducted with amendment in Regulation.

Subject Expert from outside the parent university proposed to conduct advanced supplementary examinations after completion of two years course for all semesters with the permission from university nominee.

Finally, Chairperson of BoS thanked all the members of their valuable inputs and active participation in the meeting.

Chairperson
BoS-MCA, MLEW.

HOD
Department of MCA
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AUTONOMOUS
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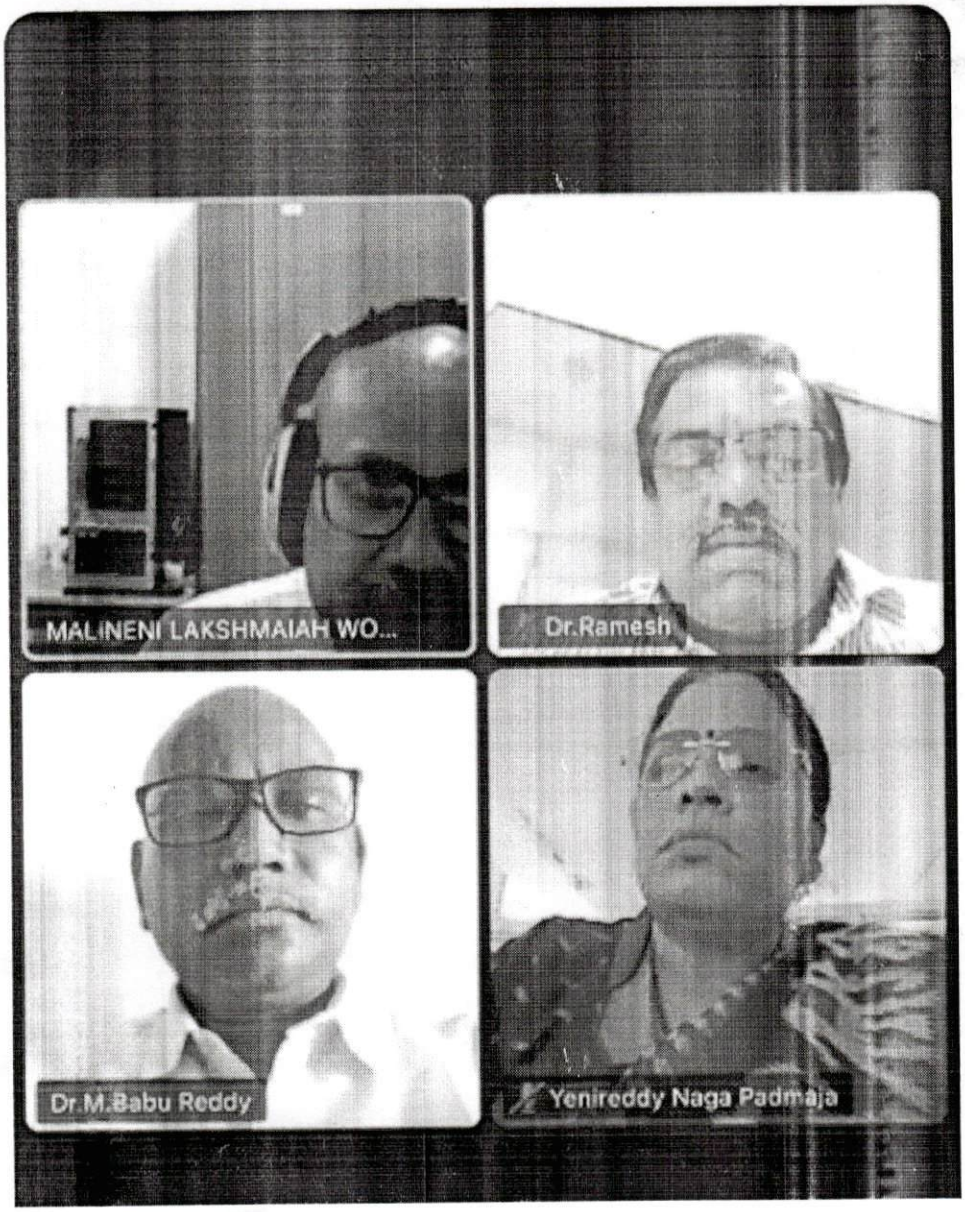

zoom Workplace
MALINENI LAKSHMAIAH...
Dr.Ramesh
Dr.M.Babu Reddy
Dr.Vunnava Dinesh B...
Yenireddy Naga Pad...
K.mounika
Dr. D. Haritha
Dr. D. Haritha
23MCA4B04 • Ad-hoc and Sensor Networks
23MCA4B05 • MOOCs-1 (NPTEL/SWAYAM)
Full Stack Technologies
Any recommended course
2 Elective-IV *
PE
23MCA4E06 • Network Programming
23MCA4E07 • Block Chain technologies
23MCA4E08 • Software Testing Methodologies
23MCA4E09 • Big Data Analytics
23MCA4B10 • MOOCs-2 (NPTEL/SWAYAM)
ION
Admin PC
M. Babu Reddy
V. Singh Babu
K. Sambi Reddy

Today

Good Morning Sir, remainder about MCA BoS Meeting at 10 a.m today - Malineni Lakshmaiah Women's Engineering College,Guntur.

9:12 am ✓✓

Ok sir 9:24 am



M Babu Reddy
V. Singh Babu,
K. Sambi Reddy

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2023 (MR23)

MASTER OF COMPUTER APPLICATIONS (MCA)

CURRICULUM

MCA Regular – II Year

(Applicable for the batches admitted from 2023-2024)

M Babu Reddy
N. Singh Babu
K. Sandhi Reddy

MASTER OF COMPUTER APPLICATIONS (MCA)
(For Two-Year PG Programme)

III Semester

S. No	Course Code	Course Name	Category	L	T	P	Credits
1	23MCA3T01	Machine Learning with Python	PC	3	0	0	3
2	23MCA3T02	Internet of Things	PC	3	0	0	3
3	23MCA3T03	Web Technologies	PC	3	0	0	3
4	23MCA3T04	Cryptography and Network Security	PC	3	0	0	3
5	23MCA3E01 23MCA3E02 23MCA3E03 23MCA3E04 23MCA3E05	**Elective-II** • Soft Computing • Software Project Management • Cloud Computing • Optimization Techniques • Cyber Security	PE	3	0	0	3
6	23MCA3L01	Machine Learning with Python Lab	PC	0	0	3	1.5
7	23MCA3L02	IoT Lab	PC	0	0	3	1.5
8	23MCA3L03	Web Technologies Lab	PC	0	0	4	2
9	23MCA3P01	Internship / Industry Oriented Mini Project/ Skill Development Course **(Minimum 6-weeks)**	PR	0	0	0	2
			Total	15	0	10	22

IV Semester

S. No	Course Code	Course Name	Category	L	T	P	Credits
1	23MCA4E01 23MCA4E02 23MCA4E03 23MCA4E04 23MCA4E05	**Elective-III *** • Digital Marketing • Human Resource Management • Deep Learning • Ad-hoc and Sensor Networks • MOOCs-1 (NPTEL/SWAYAM) - Full Stack Technologies - Any recommended course	PE	3	0	0	3
2	23MCA4E06 23MCA4E07 23MCA4E08 23MCA4E09 23MCA4E10	**Elective-IV *** • Network Programming • Block Chain technologies • Software Testing Methodologies • Big Data Analytics • MOOCs-2 (NPTEL/SWAYAM) -Data Science -Any recommended course	PE	3	0	0	3
3	23MCA4P01	Project Work/ Dissertation	PR	0	0	0	12
			Total	6	0	0	18

M. Babu. Reddy
V. Singh Babu
K. Sambi Reddy

III Semester		L	T	P	C
		3	0	0	3

MACHINE LEARNING WITH PYTHON (23MCA3T01)

Course Objectives:

- From the course the student will learn
- To design and analyze various machine learning algorithms and techniques with a modern outlook focusing on recent advances.
- Explore supervised and unsupervised learning paradigms of machine learning.
- To explore Deep learning technique and various feature extraction strategies.

Course Outcomes(CO's):

At the end of the course, student will be able to

- Illustrate and comprehend the basics of Machine Learning with Python
- Demonstrate the algorithms of Supervised Learning and be able to differentiate linear and logistic regressions
- Demonstrate the algorithms of Unsupervised Learning and be able to understand the clustering
- algorithms
- Evaluate the concepts of binning, pipeline Interfaces with examples
- Apply the sentiment analysis for various case studies

UNIT- I:

Introduction to Machine Learning with Python: Introduction to Machine Learning, basic terminology, Types of Machine Learning and Applications, Using Python for Machine Learning: Installing Python and packages from the Python Package Index, Introduction to NumPy, SciPy, matplotlib and scikit-learn, Tiny application of Machine Learning.

UNIT- II:

Supervised Learning: Types of Supervised Learning, Supervised Machine Learning Algorithms: k- Nearest Neighbors, Regression Models, Naive Bayes Classifiers, Decision Trees, Ensembles of Decision Trees, Kernelized Support Vector Machines, Uncertainty Estimates from Classifiers.

M. Babu Reddy
V. Bhagh Babu
K. Sambi Reddy

UNIT- III:

Building good training datasets: Dealing with missing data, Handling categorical data, partitioning a data set into separate training and test datasets, bringing features onto the same scale, selecting meaningful features, assessing feature importance with random forests. Compressing data via dimensionality reduction: Unsupervised dimensionality reduction via PCA, Supervised data compression via linear discriminant analysis (Text Book 2)

UNIT- IV:

Learning best Practices for Model Evaluation and Hyperparameter tuning: streamlining workñows with pipelines, using k-fold cross validation to assess model performance, debugging algorithms with learning and validation curves, fine tuning machine learning models via grid search, looking at different performance evaluation metrics. Combining different model sfor Ensemble learning: learning with ensembles, combining classifiers via majority vote, bagging-building an ensemble of classifiers from bootstrap samples, leveraging weak learners via adaptive boosting (Text Book 2)

UNIT- V:

Working with Text Data (Data Visualization): Types of Data Represented as Strings, Example Application: Sentiment Analysis of Movie Reviews, Representing Text Data as a Bag of Words, Stop Words, Rescaling the Data with tf-idf, Investigating Model Coefficients, Approaching a Machine Learning Problem, Testing Production Systems, Ranking, Recommender Systems and Other kinds of Learning.

Text Books:

- Introduction to Machine Learning with Python: A Guide for Data Scientists, Andreas C. Muller & Sarah Guido, Orielly Publications, 2019.
- Python Machine Learning, Sebastian Raschka & Vahid Mirjalili, 3rd Edition, 2019.
- Machine Learning using Python, Manaranjan Pradhan, U Dinesh Kumar, Wiley, 1st Edition, 2019

Reference Books:

- Machine Learning, Tom M. Mitchell, Mc Graw-Hill Publication,
- Building Machine Learning Systems with Python, Luis Pedro Coelho, Willi Richert, 2nd Edition, 2015.
- Programming and Problem Solving with Python, Ashok Namdev Kamthane, Amit Ashok Kamthane, TMH, 2019

M. Babu Reddy
V. Raghubabu
K. Sambaji Reddy

III Semester		L	T	P	C
		3	0	0	3

INTERNET OF THINGS (23MCA3T02)

Course Objectives:

- Identify problems that are amenable to solution by AI methods, and which AI methods may be suited to solving a given problem.
- Formalize a given problem in the language/framework of different AI methods (e.g., as a search problem, as a constraint satisfaction problem, as a planning problem, as a Markov decision process, etc).
- Design and carry out an empirical evaluation of different algorithms on problem formalization, and state the conclusions that the evaluation supports.

Course Outcomes(COs):

At the end of the course, student will be able to

- Explain the definition and usage of the term 'the internet of things' in different contexts
- Discover the various network protocols used in IoT
- Define the role of big data, cloud computing and data analytics in a typical IoT system.
- Compare and contrast the threat environment based on industry and/or device type
- Design a simple IoT system made up of sensors, wireless network connection, data analytics and display/actuators, and write the necessary control software

UNIT- I:

The Internet of Things: An Overview of Internet of things, Internet of Things Technology, behind Io Ts Sources of the Io Ts, M2M Communication, Examples of IoTs, Design Principles For Connected Devices Internet Connectivity Principles, Internet connectivity, Application Layer Protocols: HTTP, HTTPS, FTP, Telnet.

UNIT -II:

Business Models for Business Processes in the Internet of Things ,IoT/M2M systems LAYERS AND designs standardizations ,Modified OSI Stack for the IoT/M2M Systems ,ETSI M2M domains and High-level capabilities ,Communication Technologies, Data Enrichment and Consolidation and Device Management Gateway Ease of designing and affordability

UNIT- III:

Design Principles for the Web Connectivity for connected-Devices, Web Communication protocols for Connected Devices, Message Communication protocols for Connected Devices, Web Connectivity for connected-Devices.

M. Babu Reddy
V. Singh Babu
K. Sambi Reddy

UNIT -IV:

Data Acquiring, Organizing and Analytics in IoT/M2M, Applications /Services/ Business Processes , IOT/M2M Data Acquiring and Storage, Business Models for Business Processes in the Internet Of Things, Organizing Data, Transactions, Business Processes, Integration and Enterprise Systems.

UNIT- V:

Data Collection, Storage and Computing Using a Cloud Platform for IoT/M2M Applications/Services, Data Collection, Storage and Computing Using cloud platform Everything as a service and Cloud Service Models, IOT cloud-based services using the Xively (Pachube/COSM), Nimbits and other platforms Sensor, Participatory Sensing, Actuator, Radio Frequency Identification, and Wireless, Sensor Network Technology, Sensors Technology ,Sensing the World.

Text Books:

- Internet of Things: Architecture, Design Principles And Applications, 1st ed, Rajkamal, McGraw Hill Higher Education, 2017.
- Internet of Things, 1st ed, A.Bahgya and V.Madisetti, Univesity Press, 2014

Reference Books:

- Designing the Internet of Things, 1st ed, Adrian McEwen and Hakim Cassimally, Wiley, 2013.
- Getting Started with the Internet of Things, 1st ed, CunoPfister , Oreilly, 2011.

M. Babu Reddy
V. Bangh Babu
K. Sambi Reddy

III Semester		L	T	P	C
		3	0	0	3

WEB TECHNOLOGIES (23MCA3T03)

Course Objectives:

- To Learn PHP language for server side scripting
- To introduce XML and processing of XML Data with Java
- To introduce Server side programming with Java Servlets and JSP
- To introduce Client side scripting with JavaScript.

Course Outcomes (COs):

At the end of the course, student will be able to

- Analyze a web page and identify its elements and attributes.
- To acquire knowledge of xml fundamentals and usage of xml technology in electronic data interchange
- Build dynamic web pages using JavaScript (client side programming).
- To design and develop web based enterprise systems for the enterprises using technologies like jsp, servlet.
- Build web applications using PHP

UNIT- I:

Web Basics- Introduction, Concept of Internet- History of Internet, Protocols of Internet, World Wide Web, URL, Web Server, Web Browser. HTML- Introduction, History of HTML, Structure of HTML Document: Text Basics, Structure of HTML Document: Images and Multimedia, Links and webs, Document Layout, Creating Forms, Frames and Tables, Cascading style sheets.

UNIT -II:

XML Introduction- Introduction of XML, , Defining XML tags, their attributes and values, Document Type Definition, XML Schemes, Document Object Model, XHTML Parsing XML Data _ DOM and SAX Parsers in java.

M. Babu Reddy
V. Singh Baba
K. Sambi Reddy

UNIT- III:

Introduction to Servlets: Common Gateway Interface (CGI), Life cycle of a Servlet, deploying a Servlet, The Servlet API, Reading Servlet parameters, Reading Initialization parameters, Handling Http Request & Responses, Using Cookies and Sessions, connecting to a database using JDBC.

UNIT- IV:

Introduction to JSP: The Anatomy of a JSP Page, JSP Processing, Declarations, Directives, Expressions, Code Snippets, implicit objects, Using Beans in JSP Pages, Using Cookies and session for session tracking, connecting to database in JSP. Client-side Scripting: Introduction to JavaScript, JavaScript language – declaring variables, scope of variables, functions. event handlers (onClick, onsubmit etc.), Document Object Model, Form validation.

UNIT- V:

Introduction to PHP: Declaring variables, data types, arrays, strings, operators, expressions, control structures, functions, reading data from web form controls like text boxes, radio buttons, lists etc., Handling File Uploads. Connecting to database (MySQL as reference), executing simple queries, handling results, Handling sessions and cookies File Handling in PHP: File operations like opening, closing, reading, writing, appending, deleting etc. on text and binary files, listing directories.

Text Books:

- Web Technologies, Uttam K Roy, Oxford University Press.
- The Complete Reference PHP Steven Holzner, Tata McGraw-Hill.

Reference Books:

- Web Programming, building internet applications, Chris Bates 2nd edition,Wiley Dreamtech.
- Java Server Pages Hans Bergsten, SPD O'Reilly.
- Java Script, D.Flanagan Beginning Web Programming-Jon Duckett WROX.

M. Babu Reddy
V. Singh Babu
K. Sambi Reddy

III Semester		L	T	P	C
		3	0	0	3

CRYPTOGRAPHY AND NETWORK SECURITY (23MCA3T04)

Course Objectives:

- To learn various cryptographic algorithms including secret key cryptography, hashes and message digests, public key algorithms,
- To Familiar in design issues and working principles of various authentication protocols and various secure communication standards including Kerberos, IPsec, and S/MIME

Course Outcomes:

At the end of the course, student will be able to

- Explain Basic Principles, different security threats, countermeasures, foundation course of cryptography mathematics and Symmetric Encryption.
- Classify the basic principles of Asymmetric key algorithms and operations of asymmetric key cryptography.
- Design Cryptographic Hash Functions as SHA-3 and Digital Signatures as Elgamal
- Explain the concept of Revise Key Management and Distribution and User Authentication
- Determine the knowledge of Network and Internet Security Protocols such as S/MIME

UNIT- I:

Basic Principles: Security Goals, Cryptographic Attacks, Services and Mechanisms, Mathematics of Cryptography. Symmetric Encryption: Mathematics of Symmetric Key Cryptography, Introduction to Modern Symmetric Key Ciphers, Data Encryption Standard, Advanced Encryption Standard.

UNIT- II:

Asymmetric Encryption: Mathematics of Asymmetric Key Cryptography-Primes, primality Testing, Factorization, Asymmetric Key Cryptography-RSA Cryptosystem, Rabin Cryptosystem, E1Gamal Cryptosystem, Elliptic Curve Cryptosystem

M Babu Reddy
V. Singh Babu
K. Sambi Reddy

UNIT -III:

Cryptographic Mash Functions: Applications of Cryptographic Hash Functions, Two Simple Hash Functions Requirements and Security Hash Functions Based on Cipher Block Chaining, Secure Hash Algorithm (SHA), SHA-3. Digital Signatures: Elgamal Digital Signature Scheme, Schnorr Digital Signature, NIST Digital Signature Algorithm.

UNIT -IV:

Key Management and Distribution: Symmetric Key Distribution Using Symmetric Encryption, Symmetric Key Distribution Using Asymmetric Encryption, Distribution of Public Keys, X.509 CeGificates. User Authentication: User Authentication, Remote User-Authentication Principle, Remote User-Authentication Using Symmetric Encryption, Kerberos, Remote User-Authentication Using Asymmetric Encryption

UNIT -V:

Network and Internet Security Electronic Mail Security: Internet Mail Architecture, Email Formats, Email Threats and Comprehensive Email Security, S/MIME. IP Security: IP Security Policy, Encapsulating Security Payload, Combining Security Associations Internet Key Exchange

Text Books:

- Cryptography and Network Security,3rd Edition Behrouz
- A Forouzan, Deb deep Mukhopadhyay, McGraw Hill,2015
- Cryptography and Network Security, William Stallings, Global Edition, 7e Pearson, 2017

Reference Books:

Network Security and Cryptography, First Edition, Bernard Meneges, Cengage Learning, 2018

M. Babu Reddy
V. Singh Babu
K. Sambi Reddy

III Semester		L	T	P	C
		3	0	0	3

SOFT COMPUTING (23MCA3E01)

Course Objectives:

- Develop the skills to gain a basic understanding of neural network theory and fuzzy logic theory.
- Introduce students to artificial neural networks and fuzzy theory from an engineering perspective

Course Outcomes:

- Comprehend the fuzzy logic and the concept of fuzziness involved in various systems and fuzzy
- set theory.
- Understand the concepts of fuzzy sets, knowledge representation using fuzzy rules, approximate reasoning, fuzzy inference systems, and fuzzy logic
- To understand the fundamental theory and concepts of neural networks, Identify different neural network architectures, algorithms, applications and their limitations
- Understand appropriate learning rules for each of the architectures and learn several neural
- network paradigms and its applications
- Reveal different applications of these models to solve engineering and other problems.

UNIT-I:

Fuzzy Set Theory: Introduction to Neuro, Fuzzy and Soft Computing, Fuzzy Sets, Basic function and Terminology, Set-theoretic Operations, Member Function Formulation and Parameterization, Fuzzy Rules and Fuzzy Reasoning, Extension Principle and Fuzzy Relations, Fuzzy If-Then Rules, Fuzzy Reasoning, Fuzzy Inference Systems, Mamdani Fuzzy Models, Sugeno Fuzzy Models, Tsukamoto Fuzzy Models, Input Space Partitioning and Fuzzy Modeling.

UNIT-II:

Optimization: Derivative based Optimization, Descent Methods, and The Method of Steepest Descent, Classical Newton's Method, Step Size Determination, Derivative-free Optimization, Genetic Algorithms, Simulated Annealing, and Random Search, Downhill Simplex Search.

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V. Singh Baba
K. Sambi Reddy

UNIT-III:

Artificial Neural Networks: Introduction and ANN Structure, Biological neurons and artificial neurons. Model of an ANN, Activation functions used in ANNs, Typical classes of network architectures, Single layer perceptrons, Structure and learning of perceptrons. Feed forward ANN, Structures of Multi-layer feed forward networks, back propagation algorithm, Back propagation - training and convergence.

UNIT-IV:

Neuro Fuzzy Modeling: Adaptive Neuro-Fuzzy Inference Systems, Architecture Hybrid Learning Algorithm, Learning Methods that Cross-fertilize ANFIS and RBFN Coactive Neuro Fuzzy Modeling, Framework Neuron Functions for Adaptive Networks Neuro Fuzzy Spectrum.

UNIT-V:

Applications Of Computational Intelligence: Printed Character Recognition, Inverse Kinematics Problems, Automobile Fuel Efficiency Prediction, Soft Computing for Coloripe Prediction.

Text Books:

- "Neuro-Fuzzy and Soft Computing", J.S.R.Jang, C.T.Sun and E.Mimtani, PHI, 2004, Pearson Education 2004
- Satish Kumar, "Neural Networks: A classroom approach", Tata McGraw Hill, 2004.
- "Artificial Intelligence and Intelligent Systems", N.P.Padhy, Oxford University Press, 2006

Reference Books:

- Artificial Intelligence, Second Edition, Elaine Rich & Kevin Knight, Tata McGraw Hill Publishing Comp., New Delhi, , 2nd edition-2006
- "Fuzzy Logic with Engineering Applications", Timothy J.Ross, McGraw-Hill, 3rd edition-1997

M Babu Reddy
V. Singh Babu
K. Sambi Reddy

III Semester		L	T	P	C
		3	0	0	3

SOFTWARE PROJECT MANAGEMENT (23MCA3E02)

Course Objectives:

At the end of the course, the student shall be able to:

- To describe and determine the purpose and importance of project management from the perspectives of planning, tracking and completion of project
- To compare and differentiate organization structures and project structures
- To implement a project to manage project schedule, expenses and resources with the application of suitable project management tools

Course outcomes:

Upon the completion of the course students will be able to:

- Apply the process to be followed in the software development life-cycle models
- Apply the concepts of project management & planning
- Implement the project plans through managing people, communications and change
- Conduct activities necessary to successfully complete and close the Software projects
- Implement communication, modeling, and construction & deployment practices in software development

UNIT-I:

Conventional Software Management: The waterfall model, conventional soñware Management performance. Evolution of Software Economics: Soñware Economics, pragmatic software cost estimation. Improving Software Economics: Reducing Soñware product size, improving soñware processes, improving team effectiveness, improving automation, Achieving required quality, peer inspections.The old way and the new: The principles of conventional software Engineering, principles of modern software management, transitioning to an iterative process.

UNIT-II:

Life cycle phases: Engineering and production stages, inception, Elaboration, construction, transition phases.Artifacts of the process: The artifact sets, Management artifacts, Engineering artifasts, programmatic artifacts.

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UNIT- III:

Model based software architectures: A Management perspective and technical perspective. Work Flows of the process: Software process workflows, Iteration workflows.Checkpoints of the process: Major mile stones, Minor Milestones, Periodic status assessments. Iterative Process Planning: Work breakdown structures, planning guidelines, cost and schedule estimating, Iteration planning process, Pragmatic planning.

UNIT- IV:

Project Organizations and Responsibilities: Line-of-Business Organizations, Project Organizations, evolution of Organizations. Process Automation: Automation Building blocks, The Project Environment. Project Control and Process instrumentation: The seven core Metrics, Management indicators, quality indicators, life cycle expectations, pragmatic Software Metrics, Metrics automation.

UNIT-V:

Agile Methodology, adapting to Scrum, Patterns for Adopting Scrum, Iterating towards Agility. Fundamentals of DevOps: Architecture, Deployments, Orchestration, Need, Instance of applications, DevOps delivery pipeline, DevOps eco system. DevOps adoption in projects: Technology aspects, Agiling capabilities, Tool stack implementation, People aspect, processes

Text Books:

- Software Project Management, Walker Royce, PEA, 2005.
- Succeeding with Agile: Software Development Using Scrum, Mike Cohn, Addison Wesley.
- The DevOps Handbook: How to Create World-Class Agility, Reliability, and Security in Technology Organizations, Gene Kim , John Willis , Patrick Debois , Jez Humb,1st Edition, O'Reilly publications, 2016.

Reference Books:

- Software Project Management, Bob Hughes,3/e, Mike Cotterell, TMH
- Software Project Management, Joel Henry, PEA
- Software Project Management in practice, Pankaj Jalote, PEA, 2005,
- Effective Soñware Project Management, Robert K.Wysocki, Wiley,2006
- Project Management in IT, Kathy Schwalbe, Cengage
- Quality Software Project Management, Futrell,Donald F. Shafer, Donald I. Shafer, PEA

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III Semester		L	T	P	C
		3	0	0	3

CLOUD COMPUTING (23MCA3E03)

Course Objectives:

- The main objective of the course is to implement Virtualization, Task Scheduling algorithms, apply Map-Reduce concept to applications, building Private Cloud and to know the impact of engineering on legal and societal issues involved

Course Outcomes:

At the end of the course, student will be able to

- Interpret the key dimensions of the challenge of Cloud Computing
- Examine the economics, financial, and technological implications for selecting cloud computing for own organization
- Assessing the financial, technological, and organizational capacity of employer's for actively initiating and installing cloud-based applications
- Evaluate own organizations' needs for capacity building and training in cloud computing-related IT areas
- Illustrate Virtualization for Data-Center Automation

UNIT-I:

Systems modeling, Clustering and virtualization: Scalable Computing over the Internet, Technologies for Network based systems, System models for Distributed and Cloud Computing, Software environments for distributed systems and clouds, Performance, Security And Energy Efficiency.

UNIT-II:

Virtual Machines and Virtualization of Clusters and Data Centers: Implementation Levels of Virtualization, Virtualization Structures/ Tools and mechanisms, Virtualization of CPU, Memory and I/O Devices, Virtual Clusters and Resource Management, Virtualization for Data Centre Automation.

UNIT-III:

Cloud Platform Architecture: Cloud Computing and service Models, Architectural Design of Compute and Storage Clouds, Public Cloud Platforms, Inter Cloud Resource Management, Cloud Security and Trust Management. Service Oriented Architecture, Message Oriented Middleware.

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K. Sambi Reddy

UNIT-IV:

Cloud Programming and Software Environments: Features of Cloud and Grid Platforms, Parallel & Distributed Programming Paradigms, Programming Support of Google App Engine, Programming on Amazon AWS and Microsoft Azure, Emerging Cloud Software Environments. Storage Systems: Evolution of storage technology, storage models, file systems and database, distributed file systems, general parallel file systems. Google file system, Apache Hadoop, BigTable, Megastore, Amazon Simple Storage Service(S3).

UNIT-V:

Cloud Resource Management and Scheduling : Policies and Mechanisms for Resource Management Applications of Control Theory to Task Scheduling on a Cloud, Stability of a Two Level Resource Allocation Architecture, Feedback Control Based on Dynamic Thresholds. Coordination of Specialized Autonomic Performance Managers, Resource Bundling, Scheduling Algorithms for Computing Clouds, Fair Queuing, Start Time Fair Queuing, Borrowed Virtual Time, Cloud Scheduling Subject to Deadlines, Scheduling MapReduce Applications Subject to Deadlines.

Text Books:

- Distributed and Cloud Computing, Kai Hwang, Geoffry C. Fox, Jack J. Dongarra MK Elsevier.
- Cloud Computing, Theory and Practice, Dan C Marinescu, MK Elsevier.
- Cloud Computing, A Hands on approach, Arshadeep Bahga, Vijay Madisetti, University Press

Reference Books:

- Cloud Computing: A Practical Approach. Anthony T.Velte. Toby J.VeFte, Robert Elsenpeter. Tata McGraw Hill. rp2Oll.
- Enterprise Cloud Computing Gautam Shroif, Cambridge University Press. 2010.
- Cloud Computing: Implementation, Management and Security, John W. Rittinouse, James F Ransome. CRC Press, rp2012.
- Cloud Application Architectures: Building Applications and Infrastructure in the Cloud. George Reese, O'Really SPD, rp2Oll.
- Cloud Security and Privacy: An Enterprise Perspective on Risks and Compliance, Tim Mather, Subra Ktriaraswamy, Shahed Latif, O'Redç SPD, rp2Oll.

Note: The students shall register in any of the Clouds like AWS/Azure, etc and learn about cloud services.

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III Semester		L	T	P	C
		3	0	0	3

OPTIMIZATION TECHNIQUES (23MCA3E04)

Course Objectives:

- To understand the theory of optimization methods and algorithms developed for solving various types of optimization problems.
- To develop and promote research interest in applying optimization techniques in problems of Engineering and Technology.
- To apply the mathematical results and numerical techniques of optimization theory to concrete Engineering problems.

Course Outcomes(COs):

At the end of the course, student will be able to

- Describe clearly a problem, identify its parts and analyze the individual functions
- Feasibility study for solving an optimization problem
- Becoming a mathematical translation of the verbal formulation of an optimization problem
- To design algorithms, the repetitive use of which will lead reliably to finding an approximate solution
- Discovery, study and solve optimization problems
- Investigate, study, develop, organize and promote innovative solutions for various applications

UNIT- I:

Development: Definition, Characteristics and Phrases, scientific method. Types of models, general methods for solving, operations research modes, Allocation: introduction linear programming formulation, graphical solution, simplex methods, aGificial variable technique, duality principle,

UNIT- II:

Transportation problem: Formulation, optimal solution, unbalanced transportation, Assignment problem: formulation, optimal solution, variations problem, degeneracy i.e. non square MXN) matrix, restrictions, Sequencing: Introduction, optimal solution for processing each of n jobs through three machines, travelling salesman problem (i.e.) shortest acyclic route models.

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K. Sambi Reddy

UNIT- III:

Replacement: Introduction, replacement of items that deteriorate when money value is not counted and counted, and replacement of items that fail completely (i.e.) group replacements, Waiting lines: Introduction, single channel, Poisson arrivals, exponential service time infinite population and unrestricted queue.

UNIT -IV:

Inventory: Introduction, single item, deterministic models, production is instantaneous or at a constant rate , shortages are allowed or not allowed and with drawls from stock is continuous, purchase inventory model with one price break, shortages are not allowed, instantaneous production demand production or purchase cost is relevant, stochastic models, simple problems.

UNIT-V:

Theory of Games: Introduction, minmax (maximum), criterion and optimal strategy solution of games with saddle points, rectangular without saddle points. Dynamic programming: Introduction, Bellman's Principle of optimality, solutions for simple problems, Project Management: PERT and CPM, difference between PERT and CPM, PERT/CPM network components and precedence relations, Time Estimates for activities

Text Books:

- Operations Research, 2nd Edition, S.D.Sharma, Ramnath, & Kedarnath co, Meerut, 2009
- Operations Research, An introduction, 8th Edition, Taha, Pearson, 2008

Reference Books:

- Operations Research, Revised edition, P.K.Gupta, D.S. Hira, S.Chand, 2014
- Operations Research, Problems & solutions, 2nd Edition, JK Sharma, Macmillan, 2003
- Operations Research, 2nd Edition, Panneerselvam, PHI, 2004

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III Semester		L	T	P	C
		3	0	0	3

CYBER SECURITY (23MCA3E05)

Course Objectives:

- To familiarize various types of cyber-attacks and cyber-crimes
- To give an overview of the cyber laws
- To study the defensive techniques against these attacks•.

Course Outcomes:

At the end of the course,

- student will be able to understand cyber-attacks, types of cybercrimes, cyber laws and also how to protect them self and ultimately the entire Internet community from such attacks.

UNIT-I:

Introduction to Cyber Security: Basic Cyber Security Concepts, layers of security, Vulnerability, threat, Harmful acts, Internet Governance _ Challenges and Constraints, Computer Criminals, CIA Triad, Assets and Threat, motive of attackers, active attacks, passive attacks, Soñware attacks, hardware attacks, Spectrum of attacks, Taxonomy of various attacks, IP spoofing, Methods of defense, Security Models, risk management, Cyber Threats-Cyber Warfare, Cyber Crime, Cyber terrorism, Cyber Espionage, etc., Comprehensive Cyber Security Policy.

UNIT-II:

Cyberspace and the Law & Cyber Forensics: Introduction, Cyber Security Regulations, Roles of International Law. The INDIAN Cyberspace, National Cyber Security Policy. Introduction, Historical background of Cyber forensics, Digital Forensics Science, The Need for Computer Forensics, Cyber Forensics and Digital evidence, Forensics Analysis of Email, Digital Forensics Lifecycle, Forensics Investigation, Challenges in Computer Forensics, Special Techniques for Forensics Auditing

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UNIT-III:

Cybercrime: Mobile and Wireless Devices: Introduction, Proliferation of Mobile and Wireless Devices, Trends in Mobility, Credit card Frauds in Mobile and Wireless Computing Era, Security Challenges Posed by Mobile Devices, Registry Settings for Mobile Devices, Authentication service Security, Attacks on Mobile/Cell Phones, Mobile Devices: Security Implications for Organizations, Organizational Measures for Handling Mobile, Organizational Security Policies and Measures in Mobile Computing Era, Laptops

UNIT-IV:

Cyber Security: Organizational Implications: Introduction, cost of cybercrimes and IPR issues, web threats for organizations, security and privacy implications, social media marketing: security risks and perils for organizations, social computing and the associated challenges for organizations. Cybercrime and Cyber terrorism: Introduction, intellectual property in the cyberspace, the ethical dimension of cybercrimes the psychology, mindset and skills of hackers and other cyber criminals.

UNIT-V:

Privacy Issues: Basic Data Privacy Concepts: Fundamental Concepts, Data Privacy Attacks, Data linking and profiling, privacy policies and their specifications, privacy policy languages, privacy in different domains- medical, financial, etc.

Text Books:

- Nina Godbole and Sunit Belpure, Cyber Security Understanding Cyber Crimes, Computer Forensics and Legal Perspectives, Wiley
- B. B. Gupta, D. P. Agrawal, Haoxiang Wang, Computer and Cyber Security: Principles,
- Algorithm, Applications, and Perspectives, CRC Press, ISBN 9780815371335, 2018.

Reference Books:

- Cyber Security Essentials, James Graham, Richard Howard and Ryan Otson, CRC Press.
- Introduction to Cyber Security, Chwan-Hwa(john) Wu,J. David Irwin, CRC Press T&F Group

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III Semester		L	T	P	C
		0	0	3	1.5

MACHINE LEARNING WITH PYTHON LAB (23MCA3L01)

Course Objectives:

- Make use of Data sets in implementing the machine learning algorithms
- Implement the machine learning concepts and algorithms in any suitable language of choice.
- Design Python programs for various Learning algorithms.

Course Outcomes(COs):

At the end of the course, student will be able to

- Implement procedures for the machine learning algorithms
- Design Python programs for various Learning algorithms
- Apply appropriate data sets to the Machine Learning algorithms
- Identify and apply Machine Learning algorithms to solve real world problems Note: Consider any dataset from kaggle

Experiment 1:

- Installation of Python and its packages (Pandas, NumPy, SciPy, matplotlib and scikit-learn)
  (Install Anaconda, Jypyter Notebook, Programs covering basic concepts in Python Programming) Basics of Python:
- Write a program to read two numbers from user and display the result using bitwise & , | and ^ operators on the numbers.
- Write a program to calculate the sum of numbers Yom 1 to 20 which are not divisible by 2, 3 or 5. Write a program to find the maximum of two numbers using functions.
- Implement slicing operation on strings and lists.

Experiment 2:

- Implement python program to load structured data onto DataFrame and perform exploratory data analysis
- Implement python program for data preparation activities such as filtering, grouping, ordering and joining of datasets.

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K. Sambi Reddy

Experiment 3:

Implement Python program to prepare plots such as bar plot, histogram, distribution plot, box plot, scatter plot.

Experiment 4:

- Implement Simple Linear regression algorithm in Python
- Implement Gradient Descent algorithm for the above linear regression model

Experiment 5:

- Implement Multiple linear regression algorithm using Python.

Experiment 6:

- Implement Python Program to build logistic regression and decision tree models using the Python package statsmodel and sklearn APIs.

Experiment 7:

- Implement Python Program to perform the activities such as
  -splitting the data set into training and validation datasets
  -building model using Python package on training dataset and test on the validation dataset

Experiment 8:

- Write a Python program to implement k-Nearest Neighbour algorithm to classify the iris data set. Print both correct and wrong predictions.

Experiment 9:

- Implement Support vector Machine algorithm on any data set

Experiment 10:

- Write a program to implement the naive Bayesian classifier for a sample training data set stored as a .csv file. Compute the accuracy of the classifier, considering few test data sets.

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Experiment 11:

- Write a Python program to construct a Bayesian network considering medical data. Use this model to demonstrate the diagnosis of heart patients using standard Heart Disease Data Set.

Experiment 12:

- Assuming a set of documents that need to be classified, use the naive Bayesian Classifier model to perform this task. Built-in Java classes/API can be used to write the program. Calculate the accuracy, precision and recall for your data set.

Experiment 13:

- Implement PCA on any Image dataset for dimensionality reduction and classification of images into different classes

Experiment 14:

- Implement the non-parametric Locally Weighted Regression algorithm in order to fit data points. Select appropriate data set for your experiment and draw graphs.

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III Semester		L	T	P	C
		0	0	3	1.5
IoT LAB (23MCA3E02)					

Course Objectives:

- Students will understand the concepts of Internet of Things and can able to build IoT applications

Course Outcomes:

- Interpret the impact and challenges posed by IoT networks leading to new architectural models.
- Compare and contrast the deployment of smart objects and the technologies to connect them to network.
- Appraise the role of IoT protocols for efficient network communication.
- Elaborate the need for Data Analytics and Security in IoT.
- Illustrate different sensor technologies for sensing real world entities and identify the applications of IoT in Industry.

List of Experiments:

- Familiarization with Arduino/Raspberry Pi and perform necessary software installation.
- To interface LED/Buzzer with Arduino/Raspberry Pi and write a program to turn ON LED for 1 sec after every 2 seconds.
- To interface Push buttonDigital sensor (IR/LDR) with Arduino/Raspberry Pi and write a program to turn ON LED when push button is pressed or at sensor detection.
- To interface DHT11 sensor with Arduino/Raspberry Pi and write a program to print temperature and humidity readings.
- To interface motor using relay with Arduino/Raspberry Pi and write a program to turn ON motor when push button is pressed.
- To interface OLED with Arduino/Raspberry Pi and write a program to print temperature and humidity readings on it.
- To interface Bluetooth with Arduino/Raspberry Pi and write a program to send sensor data to smartphone using Bluetooth.
- To interface Bluetooth with Arduino/Raspberry Pi and write a program to turn LED ON/OFF when '1'/'0' is received Aom smartphone using Bluetooth.

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- Write a program on Arduino/Raspberry Pi to upload temperature and humidity data to thingspeak cloud.
- Write a program on Arduino/Raspberry Pi to retrieve temperature and humidity data from thingspeak cloud.
- To install MySQL database on Raspberry Pi and perform basic SQL queries.
- Write a program on Arduino/Raspberry Pi to publish temperature data to MQTT broker.
- Write a program on Arduino/Raspberry Pi to subscribe to MQTT broker for temperature data and print it.
- Write a program to create TCP server on Arduino/Raspberry Pi and respond with humidity data to TCP client when requested.
- Write a program to create UDP server on Arduino/Raspberry Pi and respond with humidity data to UDP client when requested.

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III Semester		L	T	P	C
		0	0	4	2

WEB TECHNOLOGIES LAB (23MCA3E03)

Course Objectives:

- To implement the web pages using HTML and apply styles.
- Able to develop a dynamic webpage by the use of java script.
- Design to create structure of web page, to store the data in web document, and transport information through web.
- Able to write a well formed / valid XML document.

Course Outcomes (COs):

At the end of the course, student will be able to

- Create dynamic and interactive web pages using HTML, CSS & Java Script
- Experiment with Learn and implement XML concepts
- Develop web applications using PHP
- Show the Install Tomcat Server and execute client-server programs
- Implement programs using Ruby programming

Experiment 1:

Develop static pages (using HTML and CSS) of an online book store. The pages should resemble: www.ñipkart.com The website should consist the following pages.

a) Home page
b) Registration and user Login
c) User Profile Page
d) Books catalog
e) Shopping Cart
f) Payment By credit card
g) Order Conformation

Experiment 2:

Create and save an XML document on the server, which contains 10 users information. Write a program, which takes User Id as an input and returns the user details by taking the user information fom the XML document.

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Experiment 3:

Write a PHP script to merge two arrays and sort them as numbers, in descending order.

Experiment 4:

Write a PHP script that reads data from one file and write into another file.

Experiment 5:

Write a PHP script to print prime numbers between 1-50.

Experiment 6:

Validate the Registration, user login, user profile and payment by credit card pages using JavaScript.

Experiment 7:

Write a PHP script to:

a) Find the length of a string.
b) Count no of words in a string.
c) Reverse a string.
d) Search for a specific string.

Experiment 8:

Install TOMCAT web server. Convert the static web pages of assignments 2 into dynamic web pages using servlets and cookies.

Hint: Users information (user id, password, credit card number) would be stored in web.xml. Each user should have a separate Shopping Cart.

Experiment 9:

Redo the previous task using JSP by converting the static web pages of assignments 2 into dynamic web pages. Create a database with user information and books information. The books catalogue should be dynamically loaded from the database. Follow the MVC architecture while doing the website.

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Experiment 10:

- Install a database(Mysql or Oracle).
- Create a table which should contain at least the following fields:
  a) name
  b) password,
  c) email-id,
  d) phone number(these should hold the data from the registration form).

- Practice 'JDBC' connectivity.
- Write a java program/servlet/JSP to connect to that database and extract data from the tables and display them.
- Experiment with various SQL queries.
- Insert the details of the users who register with the web site, whenever a new user clicks the submit button in the registration page .

Experiment 11:

- Write a JSP which does the following job:
  a) Insert the details of the 3 or 4 users who register with the web site (week9) by using registration form.
  b) Authenticate the user when he submits the login form using the user name and password from the database.

Experiment 12:

- Create a simple visual bean with a area filled with a color.
- The shape of the area depends on the property shape.
  If it is set to true then the shape of the area is Square and it is Circle,
  if it is false. The color of the area should be changed dynamically for every mouse click.

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IV Semester		L	T	P	C
		3	0	0	3

DIGITAL MARKETING (23MCA4E01)

Course Objectives:

- Digital marketing aims at being SMART (Specific, Measurable, Achievable, Relevant and Time Related) so that people can withstand against competitors.

Course Outcomes (COs):

At the end of the course, student will be able to

- Explain about web pages with basic HTMLS, DHTML tags using CSS and XML, the overview of W3C DOM.
- Discuss the key elements of a digital Java Scripts.
- Apply search engine optimization techniques to a website.
- Illustrate how the effectiveness of a digital marketing campaign can be measured
- Demonstrate advanced practical skills in common digital marketing tools such as SEO, SEM, Social media and Blogs

UNIT-I:

HTML: Introduction, HTMLS, Audio Elements, Video Elements, Organizing Elements. Scripting Documents: Dynamic Document content, Document properties, Legacy DOM, Document Collections, Overview of the W3C DOM, Traversing a Document, Finding Elements in a Document, Modifying a Document, Adding Content to a Document Example

UNIT-II:

Cascading Style Sheets and Dynamic HTML: Overview of CSS, CSS for DHTML Scripting inline Styles, Scripting computed styles, Scripting CSS Classes, Scripting Style Sheets, Java Script and XML: Obtaining XML Documents, Manipulating XML with the DOM API, Transforming XML with XSLT querying XML with X path, Serializing XML, Example, XML and Web services.

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UNIT-III:

Search Engine Optimization (SEO): Searching Engine Marketing, Search Engine Optimization, Measuring SEO Success, Mapping with SEO Journey, Search Advertising: Online Advertising Payment Models, Search Advertising (Desktop & Mobile Devices), Planning & Executing a search Advertising Camping, Strategic Implications of Advertising on the search Network.

UNIT-IV:

Search Media Marketing: What is Social Media? Social Media Marketing, Social Media Marketing Strategy, Adopting Social Media in Organizations: Internal Learning, Paid-Owned-Earned Media, Social CRM, Mobile Marketing: Mobile Internet in India, What is Mobile Marketing? Email Marketing Strategy, Forms of Mobile Marketing, Mobile Advertising, M-Commerce.

UNIT-V:

E-Mail Marketing: E-Mail Marketing in India, What is E-Mail Marketing? E-Mail Marketing Strategy,Executing E-Mail Marketing, Internet Marketing: Internet Marketing Strategy, Content Marketing, Content Marketing in India.

Text Books:

- The Art of Digital Marketing: The Definitive Guide to Creating Strategic, Targeted, and Measurable Online Campaigns, Ian Dodson, Wiley, 2016
- Programming the World Wide Web, Robet W Sebesta, Pearson, 8th edition, 2015

Reference Books:

- Fundamentals of Digital Marketing, Second Edition, Pearson Paperback,
- Internet Marketing- A Practical approach in the India Context by Moutusy Maity, Oxford
- Java Script: The Definite Guide David Flanagan, O' Reilly Publisher

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IV Semester		L	T	P	C
		3	0	0	3

HUMAN RESOURCE MANAGEMENT (23MCA4E02)

Course Objectives:

- Contribute to the development, implementation, and evaluation of employee recruitment, selection, and retention plans and processes.
- Administer and contribute to the design and evaluation of the performance management program.
- Develop, implement, and evaluate employee orientation, training, and development programs.
- Facilitate and support effective employee and labour relations in both non-union and union environments.

Course Outcomes (COs):

At the end of the course, student will be able to

- Explain the importance of human resources and their effective management in organizations
- Demonstrate a basic understanding of different tools used in forecasting and planning, human resource need.
- Describe the meanings of terminology and tools used in managing employees effectively Make use of Record governmental regulations affecting employees and employers
- Analyze the key issues related to administering the human elements such as motivation, compensation, appraisal, career planning, diversity, ethics, and training

UNIT-I:

HRM: Significance - Definition and Functions _ evolution of HRM- Principles - Ethical Aspects of HRM- - HR policies, Strategies to increase firm performance - Role and position of HR department _ aligning HR strategy with organizational strategy - HRM at global perspective -challenges _ cross- cultural problems _ emerging trends in HRM.

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V. Pinga Babu K. Sambi Reddy

UNIT-II:

Investment perspectives of HRM: HR Planning _ Demand and Supply forecasting - Recruitment and Selection- Sources of recruitment - Tests and Interview Techniques - Training and Development _ Methods and techniques _ Training evaluation - retention - Job Analysis _ job description and specifications - Management development - HRD concepts.

UNIT-III:

Wage and Salary Administration: Concept- Wage Structure- Wage and Salary Policies- Legal Frame Work- Determinants of Payment of Wages- Wage Differentials - Job design and Evaluation- Incentive Payment Systems. Welfare management: Nature and concepts _ statutory and non-statutory welfare measures _ incentive mechanisms.

UNIT IV:

Performance Evaluation: Importance _ Methods _ Traditional and Modern methods _ Latest trends in performance appraisal - Career Development and Counseling- Compensation, Concepts and Principles- Influencing Factors- Current Trends in Compensation- Methods of Payments - compensation mechanisms at international level.

UNIT V:

Managing Industrial Relations: Trade Unions - Employee Participation Schemes- Collective Bargaining_Grievances and disputes resolution mechanisms _ Safety at work _ nature and importance _ work hazards _ safety mechanisms - Managing work place stress.

Text Books:

- K Aswathappa: "Human Resource and Personnel Management", Tata McGraw Hill, New Delhi,
- N.Sambasiva Rao and Dr. Nirmal Kumar: "Human Resource Management and Industrial Relations", Himalaya Publishing House, Mumbai
- Mathis, Jackson,Tripathy:"Human Resource Management:Asouth-Asin Perspective", Cengage Learning, New Delhi, 2013
- Subba Rao P: "Personnel and Human Resource Management-Text and Cases", Himalaya Publications, Mumbai, 2013.
- Madhurima Lall, Sakina Qasim Zasidi: "Human Resource Management", Excel Books, New Delhi,

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IV Semester		L	T	P	C
		3	0	0	3

DEEP LEARNING (23MCA4E03)

Course Objectives:

- Demonstrate the major technology trends driving Deep Learning
- Build, train and apply fully connected deep neural networks
- Implement efficient (vectorized) neural networks
- Analyze the key parameters and hyper parameters in a neural network's architecture

Course Outcomes:

- Demonstrate the mathematical foundation of neural network
- Describe the machine learning basics
- Compare the different architectures of deep neural network
- Build a convolutional neural network
- Build and train RNN and LSTMs

UNIT -I:

Linear Algebra: Scalars, Vectors, Matrices and Tensors, Matrix operations, types of matrices, Norms, Eigen decomposition, Singular Value Decomposition, Principal Components Analysis.Probability and Information Theory: Random Variables, Probability Distributions, Marginal Probability, Conditional Probability, Expectation, Variance and Covariance, Bayes' Rule, Information Theory. Numerical Computation: Overñow and Underñow, Gradient-Based Optimization, Constrained Optimization, Linear Least Squares.

UNIT -II:

Machine Learning: Basics and Underfitting, Hyper parameters and Validation Sets, Estimators, Bias and Variance, Maximum Likelihood, Bayesian Statistics, Supervised and Unsupervised Learning, Stochastic Gradient Descent, Challenges Motivating Deep Learning. Deep Feedforward Networks: Learning XOR, Gradient-Based Learning, Hidden Units, Architecture Design, Back-Propagation and other Differentiation Algorithms.

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V. Singh Baby
K. Sambi Reddy

UNIT -III:

Regularization for Deep Learning: Parameter Norm Penalties, Norm Penalties as Constrained Optimization, Regularization and Under-Constrained Problems, Dataset Augmentation, Noise Robustness, Semi-Supervised Learning, Multi-Task Learning, Early Stopping, Parameter Tying and Parameter Sharing, Sparse Representations, Bagging and Other Ensemble Methods, Dropout, Adversarial Training, Tangent Distance, Tangent Prop and Manifold Tangent Classifier. Optimization for Training Deep Models: Pure Optimization, Challenges in Neural Network Optimization, Basic Algorithms, Parameter Initialization Strategies, Algorithms with Adaptive Learning Rates, Approximate Second-Order Methods, Optimization Strategies and Meta-Algorithms.

UNIT IV:

Convolutional Networks: The Convolution Operation, Pooling, Convolution, Basic Convolution Functions, Structured Outputs, Data Types, Efficient Convolution Algorithms, Random or Unsupervised Features, Basis for Convolutional Networks.

UNIT V:

Sequence Modeling: Recurrent and Recursive Nets: Unfolding Computational Graphs, Recurrent Neural Networks, Bidirectional RNNs, Encoder-Decoder Sequence-to-Sequence Architectures, Deep Recurrent Networks, Recursive Neural Networks, Echo State Networks, LSTM, Gated RNNs, Optimization for Long-Term Dependencies, Auto encoders, Deep Generative Models.

Text Books:

- Ian Goodfellow, Yoshua Bengio, Aaron Courville, "Deep Learning", MIT Press,2016.
- Josh Patterson and Adam Gibson, "Deep learning: A practitioner's approach", O'Reilly Media, First Edition, 2017.

Reference Books:

- Fundamentals of Deep Learning, Designing next-generation machine intelligence algorithms, Nikhil Buduma, O'Reilly, Shroff Publishers, 2019.
- Deep learning Cook Book, Practical recipes to get started Quickly, Douwe Osinga, O'Reilly, Shroff Publishers, 2019.

Resources:

https://keras.io/datasets/
http://deeplearnins.net/tutorial/deeplearnins.pdf
https://arxiv.ors/pdf/1404.7828v4.pdf
https://sithub.corn/lisa-labOeepLearninsTutorials

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IV Semester		L	T	P	C
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AD-HOC AND SENSOR NETWORKS (23MCA4E04)

Course Objectives:

From the course the student will learn

- Architect sensor networks for various application setups
- Devise appropriate data dissemination protocols and model links cost
- Understanding of the fundamental concepts of wireless sensor networks and has a basic
- knowledge of the various protocols at various layers
- Evaluate the performance of sensor networks and identify bottlenecks

Course Outcomes:

- Evaluate the principles and characteristics of mobile ad hoc networks (MANETs) and what distinguishes them from infrastructure-based networks
- Determine the principles and characteristics of wireless sensor networks
- Discuss the challenges in designing MAC, routing and transport protocols for wireless ad-hoc sensor networks
- Illustrate the various sensor network Platforms, tools and applications
- Demonstrate the issues and challenges in security provisioning and also familiar with the mechanisms for implementing security and trust mechanisms in MANETs and WSNs

UNIT-I:

Introduction : Fundamentals of Wireless Communication Technology, The Electromagnetic Spectrum, Radio propagation Mechanisms ,Characteristics of the Wireless channel mobile ad hoc networks (MANETs), Wireless Sensor Networks (WSNs): concepts and architectures, Applications of Ad Hoc and Sensor Networks, Design Challenges in Ad hoc and Sensor Networks.

UNIT-II:

MAC Protocols For Ad Hoc Wireless Networks: Issues in designing a MAC Protocol, Issues in Designing a MAC Protocol for Ad Hoc Wireless Networks, Design Goals of a MAC Protocol for Ad Hoc Wireless Networks, Classification of MAC Protocols, Contention based protocols, Contention based protocols with Reservation Mechanisms, Contention based protocols with Scheduling Mechanisms, Multi channel MAC - IEEE 802.11.

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UNIT-III:

Routing Protocols And Transport Layer In Ad Hoc Wireless Networks: Routing Protocol: Issues in designing a routing protocol for Ad hoc networks, Classification, proactive routing, reactive routing (on- demand), hybrid routing, Transport Layer protocol for Ad hoc networks, Design Goals of a Transport Layer Protocol for Ad Hoc Wireless Networks, Classification of Transport Layer solutions-TCP over Ad hoc wireless, Network Security, Security in Ad Hoc Wireless Networks, Network Security Requirements.

UNIT-IV:

Wireless Sensor Networks (WSNS) and Mac Protocols: Single node architecture - hardware and software components of a sensor node, WSN Network architecture: typical network architectures, data relaying and aggregation strategies, MAC layer protocols: self-organizing, Hybrid TDMA/FDMA and CSMA based MAC -IEEE 802.15.4.

UNIT-V:

WSN Routing, Localization & Qos: Issues in WSN routing, OLSR, Localization, Indoor and Sensor Network Localization, absolute and relative localization, triangulation, QOS in WSN, Energy Efficient Design, Synchronization.

Text Books:

- "Ad Hoc Wireless Networks: Architectures and Protocols ", C. Siva Ram Murthy, and B. S. Manoj, Pearson Education, 2008
- "Wireless Adhoc and Sensor Networks", Labiod. H, Wiley, 1st edition-2008
- "Wireless ad -hoc and sensor Networks: theory and applications", Li, X, Cambridge University Press, fifth edition-2008.

Reference Books:

- "Ad Hoc & Sensor Networks:Theory and Applications", 2nd edition,Carlos De MoraisCordeiro, Dharma Prakash Agrawal ,World Scientific Publishing Company, 2011
- "Wireless Sensor Networks Feng Zhao and LeonidesGuibas,Elsevier Publication 2nd edition-
- "Protocols and Architectures for Wireless Sensor Networks", Holger Karl and Andreas Willig,Wiley, 2005 (soft copy available)
- "Wireless Sensor Networks Technology, Protocols, and Applications", KazemSohraby, Daniel Minoli, &TaiebZnati, John Wiley, 2007. (soft copy available)

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IV Semester		L	T	P	C
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NETWORK PROGRAMMING (23MCA4E06)

Course Objectives:

- Student able to learn about the protocols which are using in the current scenario.
- To learn and understand client server relations and OSI programming Implementation of the socket and IPC.

Course Outcomes:

- Explain OSI Model and Standard Internet Protocols
- How to handle server process termination .
- Acquire the knowledge of Elementary TCP sockets and I/O Multiplexing and socket
- Demonstrate the concepts of FIFOs streams messages and Remote logins.

UNIT-I:

Introduction to Network Programming: OSI model, Unix standards, TCP and UDP & TCP connection establishment and Format, Buffer sizes and limitation, standard internet services, Protocol usage by common internet application.

UNIT- II:

TCP client server: Introduction, TCP Echo server functions, Normal startup, terminate and Signal handling server process termination, Crashing and Rebooting of server host shutdown of server host.

UNIT -III:

Sockets: Address structures, value _ result arguments, Byte ordering and manipulation function and related functions Elementary TCP sockets _ Socket, connect, bind, listen, accept, fork and exec function, concurrent servers. Close function and related function.

I/O Multiplexing and socket options: I/O Models, select function, Batch input, shutdown function, poll function, TCP Echo server, getsockopt and setsockopt functions. Socket states, Generic socket option IPV6 socket option ICMPV6 socket option IPV6 socket option and TCP socket options.

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UNIT-IV:

Elementary UDP sockets: Introduction UDP Echo server function, lost datagram, summary of UDP example, Lack of ñow control with UDP, determining outgoing interface with UDP.Elementary name and Address conversions: DNS, gethost by Name function, Resolver option,Function and IPV6 support, uname function, other networking information.

UNIT-V:

IPC : Introduction, File and record locking, Pipes, FIFOs streams and messages, Name spaces, system IPC, Message queues, Semaphores. Remote Login: Terminal line disciplines, Pseudo-Terminals, Terminal modes, Control Terminals, rlogin Overview, RPC Transparency Issues.

Textbooks:

- UNIX Network Programming, Vol. I, SocketsAPI, 2nd Edition. - W.Richard Stevens, Pearson Edn. Asia.
- UNIX Network Programming, 1st Edition, - W.Richard Stevens. PHI.

References Books:

- UNIX Systems Programming using C++ T CHAN, PHI.
- UNIX for Programmers and Users, 3rd Edition Graham GLASS, King abls, Pearson Education
- Advanced UNIX Programming 2nd Edition M. J. ROCHKIND, Pearson Education

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IV Semester		L	T	P	C
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BLOCK CHAIN TECHNOLOGIES (23MCA4E07)

Course Objectives:

- Impact strong technical understanding of Blockchain technologies
- Develop familiarity of current technologies, tools, and implementation strategies
- Introduce application areas, current practices, and research activity

Course Outcomes (COs):

At the end of the course, student will be able to

- Demonstrate the foundation of the Blockchain technology and understand the processes in payment and funding.
- Identify the risks involved in building Blockchain applications.
- Review of legal implications using smart contracts.
- Choose the present landscape of Blockchain implementations and Understand Cryptocurrency markets.
- Examine how to profit Yom trading cryptocurrencies.

UNIT -I:

The consensus problem, Asynchronous Byzantine Agreement, AAP protocol and its analysis, Nakamoto Consensus on permission-less, nameless, peer-to-peer network, Abstract Models for BLOCKCHAIN, GARAY model, RLA Model, Proof of Work (PoW) as random oracle, formal treatment of consistency, liveness and fairness - Proof of Stake (PoS) based Chains, Hybrid models (PoW + PoS).

UNIT-II:

cryptographic basics for cryptocurrency, A short overview of Hashing, signature schemes, encryption schemes and elliptic curve cryptography

UNIT-III:

Bitcoin, Wallet, Blocks, Merkley Tree, hardness of mining, transaction verifiability, anonymity, forks, double spending, mathematical analysis of properties of Bitcoin.

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UNIT-IV:

Ethereum: Ethereum Virtual Machine (EVM),Wallets for Ethereum, Solidity, Smart Contracts, some attacks on smart contracts

UNIT-V:

(Trends and Topics): Zero Knowledge proofs and protocols in Blockchain, Succinct non interactive argument for Knowledge (SNARK), pairing on Elliptic curves ,Zcash.

Text Books:

- Arvind Narayanan, Joseph Bonneau, Edward Felten, Andrew Miller, and Steven Goldfeder. Bitcoin and cryptocurrency technologies: a comprehensive introduction. Princeton University Press, 2016. (Free download available)

Reference Books:

- Joseph Bonneau et al, SoK: Research perspectives and challenges for Bitcoin and cryptocurrency, IEEE Symposium on security and Privacy, 2015 (article available for free download) (curtain raiser kind of generic article, written by seasoned experts and pioneers).
- J.A.Garayet al, The bitcoin backbone protocol - analysis and applications EUROCRYPT LNCS VOl 9057, (VOLII), pp 281-310. (Also available at eprint.iacr.org/2016/1048). (serious beginning of discussions related to formal models for bitcoin protocols).
- R.Pass et al, Analysis of Blockchain protocol in Asynchronous networks , EUROCRYPT 2017, (eprint.iacr.org/2016/454) . A significant progress and consolidation of several principles).

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IV Semester		L	T	P	C
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SOFTWARE TESTING METHODOLOGIES (23MCA4E08)

Course Objectives:

- To study fundamental concepts in software testing and discuss various sohware testing issues and solutions in soñware unit, integration, regression and system testing
- To learn how to plan a test project, design test cases and data, conduct testing, manage soñware problems and defects, generate a test report
- To expose the advanced soñware testing concepts such as object-oriented soñware testing methods, web-based and component-based soñware testing
- To understand software test automation problems and solutions
- To learn how to write soñware test documents and communicate with engineers in various forms

Course Outcomes:

By the end of the course, the student should have the ability to:

- Identify and understand various software testing problems, apply software testing knowledge and engineering methods and solve these problems by designing and selecting soñware test models, criteria, strategies, and methods
- Design and conduct a soñware test process for a soñware project
- Analyze the needs of software test automation
- Use various communication methods and skills to communicate with their teammates to conduct their practice-oriented software testing projects
- Basic understanding and knowledge of contemporary issues in software testing, such as
- component-based, web based and object oriented software testing problems
- Write test cases for given sohware to test it before delivery to the customer and write test scripts for both desktop and web based applications

UNIT-I:

Software Testing: Introduction, Evolution, Myths & Facts, Goals, Psychology, definition, Model for testing, Effective Vs Exhaustive Software Testing.Software Testing Terminology and Methodology: Software Testing Terminology, Software Testing Life Cycle, Software Testing Methodology. Verification and Validation: Verification & Validation Activities, Verification, Verificaion of Requirements, High level and low level designs, verifying code, Validation .

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UNIT-II:

Dynamic Testing-Black Box testing techniques: Boundary Value Analysis, Equivalence class Testing, State Table based testing, Decision table based testing, Cause-Effect Graphing based testing, Error guessing White-Box Testing: need, Logic Coverage criteria, Basis Path testing, Graph matrices, Loop testing, data ñow testing, mutation testing

UNIT-III:

Static Testing: Inspections, Structured Walkthroughs, Technical Reviews Validation activities: Unit testing, Integration Testing, Function testing, system testing, acceptance testing.Regression testing: Progressives Vs regressive testing, Regression test ability, Objectives of regression testing, Regression testing types, Regression testing techniques

UNIT-IV:

Efficient Test Suite Management: growing nature of test suite, Minimizing the test suite and its benefits, test suite prioritization, Types of test case prioritization, prioritization techniques, measuring the effectiveness of a prioritized test suite. Software Quality Management: Software Quality metrics, SQA models Debugging: process, techniques, correcting bugs.

UNIT-V:

Automation and Testing Tools: need for automation, categorization of testing tools, selection of testing tools, Cost incurred, Guidelines for automated testing, overview of some commercial testing tools such as Win Runner, Load Runner, Jmeter and JUnit . Test Automation using Selenium tool. Testing Object Oriented Software: basics, Object oriented testing. Testing Web based Systems: Challenges in testing for web based software, quality aspects, web engineering, testing of web based systems, Testing mobile systems

Text Books:

- Software Testing, Principles and Practices, Naresh Chauhan, Oxford.
- Software Testing- Yogesh Singh, CAMBRIDGE.

Reference books:

- Foundations of Software testing, Aditya P Mathur, 2ed, Pearson.
- Software testing techniques _ Baris Beizer, Dreamtech, second edition.
- Software Testing, Principles, techniques and Tools, M G Limaye, TMH
- Effective Methods for Soflware testing, Willian E Perry, 3ed, Wiley

Resources:

https://www.tutorialspoint.com/software testing dictionary/test tools htm

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IV Semester		L	T	P	C
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BIG DATA ANALYTICS (23MCA4E09)

Course Objectives:

- To know the fundamental concepts of big data and analytics.
- To explore tools and practices for working with bigdata
- To learn about stream computing.
- To know about the research that requires the integration of large amounts of data.

Course Outcomes (COs):

At the end of the course, student will be able to

- Identify the need-based tools, viz., Pig and Hive and to handle and formulate an effective strategy to implement a successful Data analytics project
- Organize the existing technologies and the need of distributed files systems to analyze the big data.
- To Discuss the cluster and classification techniques
- Analyze the concepts of strem memory and spark models.
- Explain the use of NoSQL database in data analytics.

UNIT-I:

Introduction to Big Data- Evolution of Big data, Best Practices for Big data Analytics, Big data characteristics, Validating, The Promotion of the Value of Big Data, Big Data Use Cases, Characteristics of Big Data Applications, Perception and Quantification of Value, Understanding Big Data Storage, A General Overview of High, Performance Architecture, HDFS, MapReduce and YARN, Map Reduce Programming Model

UNIT-II:

Frameworks-Applications on Big Data Using Pig and Hive, Data processing operators in Pig, Hive services, HiveQL, Querying Data in Hive, fundamentals of HBase and Zoo Keeper, IBM InfoSphere Big Insights and Streams

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UNIT-III:

Clustering and Classification-Advanced Analytical Theory and Methods: Overview of Clustering, K-means, Use Cases - Overview of the Method, Determining the Number of Clusters, Diagnostics, Reasons to Choose and Cautions. Classification: Decision Trees, Overview of a Decision Tree, The General Algorithm, Decision Tree Algorithms, Evaluating a Decision Tree, Decision Trees in R, Nalve Bayes, Baye'sTheorem, Nalve Bayes Classifier.

UNIT-IV:

Stream Memory and Spark- Introduction to Streams Concepts, Stream Data Model and Architecture, Stream Computing, Sampling Data in a Stream, Filtering Streams, Counting Distinct Elements in a Stream, Introduction to Spark Concept, Spark Architecture and components, spark installation, spark RDD(Resilient Distributed Dataset), spark RDD operations.

UNIT-V:

NOSQL Data Management for Big Data and Visualization- NoSQL Databases: Schema-less Models: Increasing Flexibility for Data Manipulation, Key Value Stores, Document Store, Tabular Stores, Object Data Stores, Graph Databases Hive, Sharding, Hbase, Analyzing big data with twitter, Big data for E- Commerce Big data for blogs, Review of Basic Data Analytic Methods using R.

Text Books:

- Anand Rajaraman and JefYey David Ullman, "Mining of Massive Datasets", Cambridge University Press, 2012.
- David Loshin, "Big Data Analytics: From Strategic Planning to Enterprise Integration with Tools, Techniques, NoSQL, and Graph", Morgan Kaufmann/El sevier Publishers, 2013.

Reference Books:

- MichaelBerthold,DavidJ.Hand,"IntelligentDataAnalysis",Springer,2007.
- TomWhite"Hadoop:TheDefinitiveGuide"ThirdEdition,O'reillyMedia,2012.
- Chris Eaton, Dirk DeRoos, Tom Deutsch, George Lapis, Paul Zikopoulos, "Understanding Big Data: Analytics for Enterprise Class Hadoop and Streaming Data", McGrawHill Publishing,2012.
- BillFranks,"TamingtheBigData¥idalWave:FindingOpportunitiesinHugeDataStreams with Advanced Analytics", John Wiley& sons,2012.
- GlennJ.Myatt,"MakingSenseoOata",JohnWiley&Sons,2007.
- Pete Warden, "Big Data Glossary", O'Reilly,2011.
- Jiawei Han, Micheline Kamber "Data Mining Concepts and Techniques", 2Rd Edition, Elsevier, Reprinted2008.

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