SAMRAT ASHOK TECHNOLOGICAL INSTITUTE

(Engineering College), VIDISHA M.P.

(An Autonomous Institute Affiliated to RGPV Bhopal)

Department of Applied Science

Syllabus For EE,CSE, EI, EC, IT, BC, IoT and AIADS Programs

Subject Category	BSC	Subject Code:	CHB101	Subject Name:	Applied Chemistry

Maximum Marks Allotted						Contact Hours			Total Credits
Theory			Practical		Total Marks				
End Sem	Mid-Sem	Quiz/Assignment	End Sem	Lab-Work		L	T	P	
60	20	20	30	20	150	3	-	2	4

Prerequisites:

Students who have completed 12th with Science stream or Chemistry of 12th standard or equivalent

Course Objective:

The main aim of Engineering Chemistry is to make Students familiar with basic concepts of Chemistry, the students face in industry and engineering field. With this background the Students will be able to explain Scientifically the various chemistry related problems in industry/engineering field.

Course Outcomes:

Student after successful completion of course shall possess skills to think critically and analyse chemistry problems in engineering field. Students are expected to solve the chemistry problems with an engineering purview. Laboratory work is intended for students to learn conducting experiments and analyse experimental data.

CO's	CO's Description
CO1	Differentiate hard & soft water, solve the related numerical on water treatment and have knowledge regarding its Significance in industry and daily life.
CO2	Apply their knowledge regarding various types of fuels including petroleum fuels, Fuels Cells, Electrical Vehicle Batteries
CO3	Acquire basic knowledge of various types of Corrosion, its harmful effects and preventive methods.
CO4	To know basic concept of polymers and its properties.To have knowledge about advanced electroactive polymers and their applications. To know preliminary understanding of Nanomaterials and their applications.
CO5	Analyze the need of instruments. Identify and estimate about the unknown/new compounds with the help of spectroscopy/ chromatography.

UNIT	Descriptions	Hrs	CO's	Remarks
I	**WATER TECHNOLOGY:** Sources, Availability, impurities in Water, Types of hardness, Units of hardness. Concentration expression: Normality, Molarity, Molality. Water analysis techniques – Hardness determination by EDTA method, Alkalinity determination. Defects in boiler due to Hard water. External Treatment (Lime-soda, Zeolite & Ion exchange resin method) & Internal Treatment of Boiler feed water. Numerical Problems.	8	1	
II	**ELECTROCHEMISTRY & ENERGY STORAGE SYSTEMS:** Electrochemistry: Introduction, EMF of cell, Single electrode potential-Derivation of Nernst equation, Numerical problems based on Nernst Equation (E, E_o&E_{cell}). Energy Storage Systems: Introduction, Classification of batteries (primary, secondary and reserved batteries). Construction, working, and applications of Li-ion batteries. Advantages of Li-ion battery as an electrochemical energy system for electric vehicles. Recycling of Lithium-ion batteries by direct cycling Method. Introduction of Na- ion battery, graphene battery. Recycling, disposal and second use of batteries.	8	2	
III	**CORROSION, METHODS OF PREVENTION OF CORROSION** Introduction, Types of Corrosion, Disadvantages of corrosion, Theories of corrosion, Factors influencing the rate of corrosion. Methods of Prevention of Corrosion, Control of Environment, Alloying, Surface coatings, Metal coatings, Electroplating, Galvanization and Tinning, Inorganic coating, Anodizing, Cathodic Protection, Sacrificial Anode Method etc	8	3	

IV	**ENGINEERING MATERIALS:** Polymers: Nomenclature & classification of polymers. Electrically active polymers, Conducting polymers, **Liquid-crystal polymers (LCP),** Photoactive polymers, Photovoltaic materials: solar cells and dye sensitized solar cells-principle and applications, Conducting Polymers: Methods of synthesis and properties of polyaniline (PANi), polypyrrol (PPy) and polythiophene (PTh); applications of these polymers in advanced technologies. Nanomaterials: Synthesis, characterization and applications of nano materials (Eg. fullerene, graphene, carbon nanotubes and quantum dots) in electronic and nano devices. Introduction to Optical Fibres.	8	4	
V	**INSTRUMENTAL METHODS OF ANALYSIS:** Importance of Instrumental techniques. Classification of Instrumental techniques. Introduction to Electroanalytical and Spectroscopic Methods. Principle, Instrumentation, Working and applications of following techniques: Colorimetry, IR Spectroscopy, Conductometry, pH metry, Chromatography and Gas Chromatography.	8	5	
Guest Lectures (if any)				
Total Hours		40		

Suggestive list of experiments:

LABORATORY EXPERIMENTS:(Any 10 experiments to be performed)

1. To determine strength of unknown Ferrous Ammonium Sulphate $FeSO_4.(NH_4)_2SO_4.6H_2O$ (Mohr's Salt) solution by titrating it against intermediate Potassium Dichromate ($K_2Cr_2O_7$) solution using Di Phenyl Amine(DPA) as internal indicator.[Redox Titration]
2. To determine Temporary, Permanent and Total Hardness in given sample of water by E.D.T.A. method.[Complexometric Titration]
3. To determine strength of Sodium Carbonate and Sodium Bicarbonate in given alkaline solution by titrating with standard HCl using phenolphthalein and Methyl Orange indicators.
   Or
   To determine alkalinity in given water sample using Phenolphthalein and Methyl Orange indicators.[Acid Base Titration]
4. To determine strength of unknown $CuSO_4$ solution by titrating it against intermediate sodium thiosulphate (Hypo) solution using starch as final indicator.[Iodometric Titration]
5. To determine the chloride content of the given sample of water using silver nitrate solution with potassium chromate solution as an indicator.[Precipitation Titration]
6. To separate mixture of pigments by Thin Layer Chromatography [Instrumental Methods].
7. To separate mixture of pigments by Paper Chromatography [Instrumental Methods].
8. To verify Beer Lambert's law of colorimetry [Instrumental Methods].
9. To determine amount of Iron by colorimetry [Instrumental Methods].
10. To estimate amount of Iron by UV spectrophotometer.[Instrumental Methods]
11. To determine pH of given solution using pH meter. [Instrumental Methods]
12. To determine strength of acid/base by conductometric titrations. [Instrumental Methods]
13. To determine Moisture content in given sample of coal.[Proximate Analysis]
14. To determine Ash content in given sample of coal.[Proximate Analysis]
15. To determine the Viscosity Index of give lubricating oil by Redwood Viscometer No.1 and Redwood Viscometer 2.[Lubricating Oil Analysis]
16. To determine the Flash Point and Fire Point of lubricating oil by Abel's Apparatus.[Lubricating Oil Analysis]
17. To determine the Flash Point and Fire Point of lubricating oil by Pensky Martin's Apparatus.[Lubricating Oil Analysis]
18. To determine S.E.N. of given lubricating oil[Lubricating Oil Analysis].

TEXT BOOKS:

- Engineering Chemistry - Jain & Jain - Dhanpat Rai &Company Pvt. Ltd, New Delhi.
- A Text Book of Engineering Chemistry - S.S. Dara - S. Chand Publication, Delhi.
- Engineering Chemistry- Shashi Chawla, Dhanpat Rai &Company Pvt. Ltd, Delhi.
- Engineering Chemistry - Uppal - Khanna Publishers.
- A Text book of Engg. Chemistry- Agarwal, C.V, Murthy C.P, Naidu, BS Publication, Hyderabad.
- B. Sivasankar, Engineering Chemistry 1 st Edition, Mc Graw Hill Education (India), 2008
- O.G. Palanna, McGraw Hill Education (India) Private Limited, 9 th Reprint, 2015

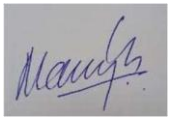
REFERENCE BOOKS:

- Chemistry in Engineering and Technology, Kuriacose J.C. and Rajaram J.,Tata McGraw Hill.
- Applied Chemistry- Theory and Practice, O.P. Viramani, A.K. Narula, New Age International Pvt. Ltd. Publishers, New Delhi.
- Chemistry of Engineering Material-C.V. Agarwal, Andranaidu C. Parameswara Moorthy -B.S. Publications.
- William Kemp, Organic Spectroscopy, 3 rd edition, Palgrave, New York, 2005.

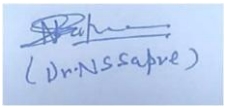
Modes of Evaluation and Rubric
Evaluation will be continuous as an integral part of the class as well through external assessment. Laboratory assessment will be based on assignments, presentations, and viva of each candidate.

List/Links of e-learning resource
• Engineering Chemistry (NPTEL Web-book), by B.L. Tembe, Kamaluddin and M.S. Krishnan • https://nptel.ac.in/course.html • https://iln.ieee.org/resources/e-learning • https://www.researchgate.net/publication/221928462_ELearning_Usage_During_Chemical_Engineering_Courses • https://learncheme.com/ • https://www.anits.edu.in/elearn_c.php

Recommendation by Board of studies on	14.6.2022 (Tuesday)
Approval by Academic council on	16.6.2022 (Thursday)
Subject handled by department	Applied Science (Chemistry)



Dr Manju Singh
Prof & Head, Chemistry
UIT, RGPV, Bhopal



Dr Nitin Sapre
Prof & Head, Chemistry
SGSITS, Indore

Dr J Parashar
Dean, Academics
SATI, Vidisha

Dr Manoj Datar
Prof & Head, Chemistry
SATI, Vidisha

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Computer Science and Engineering

Semester/Year			Program		B.Tech.
Subject Category	ESC	Subject Code:	CSA-103	Subject Name:	Problem Solving using Data Structures

Maximum Marks Allotted								Contact Hours			Total Credits
Theory				Practical			Total Marks				
End Sem	Mid-Sem	Assignment	Quiz	End Sem	Lab-Work	Quiz		L	T	P	
60	20	10	10	30	10	10	150	3	0	2	4

Prerequisites:

Logical thinking and Computer Fundamentals

Course Objective:

Introduce the fundamentals of data structures and how these concepts are useful in problem solving.

Course Outcomes:

CO-1Understand- Problem solving using of data structure and various searching and sorting methods.
CO-2 Apply- Apply different concepts of data structures to solve different computing problems.
CO-3 Analyse- Analyze the access pattern of various data structure and understand their applicability.
CO-4 Evaluate-Evaluate and Compare the performance of different data structures on real world problems.
CO-5 Discuss- Graph and Tree structure with their operations and applicability

UNITs	Descriptions	Hrs.	CO's
I	Problem solving concepts: top-down, bottom-up design, Concept of datatype, variable, constant and pointers. Dynamic memory allocation. Algorithm: Definition and complexity Analysis. Introduction to data structure: Linear, Nonlinear, Primitive and Nonprimitive. **Arrays-**Concepts of Arrays, Single dimensional array, two-dimensional array- Representation and Address Calculation, Operations on arrays with algorithms (traversing, searching, inserting, deleting) and analysis.	08	
II	**List-**Singly linked lists: Representation in memory, Operations on singly linked list with algorithms (traversing, searching, insertion, deletion)Doubly linked list-Operations with algorithms and analysis. Circular linked lists-Operations with algorithms and analysis. Representation & manipulations of polynomials/sets using linked lists.	06	
III	**Stack-** Introduction to Stack and its operations, Implementation of stack using array and linked list with comparison. Application of stacks (Polish Notations, converting infix to postfix notation, evaluating postfix notation, Parenthesis balancing, Recursion). **Queue-** Introduction to Queue and its operations. Implementation of queue using array and linked list. De-queue, circular queue, priority queue. Applications of queue.	09	
IV	**Tree-** Definition and terminology, concept of binary tree and representation, Traversing binary tree (pre order, post order, in order) Operation with algorithm -insertion and deletion. Binary Search Trees and Concept of balance tree (AVL). **Graph-** Definition and terminology, Types of graphs, Representation of graph. Traversing of graph- Breadth First Traversing and Depth First Traversing.	09	

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V	**Searching-** Search methods- Linear search, Binary search and Hashing (collision, chaining and probing) with their algorithms and analysis. **Sorting-**Sorting Methods-Bubble sort, Selection sort, Insertion sort, Quick sort, Merge sort, Radix sort, Shell sort with their algorithms and analysis.	08	
Guest Lectures (if any)		--	
Total Hours		40	

List of Experiments

1. Write program to implement pointers and structure in C to understand the concepts of Dynamic memory allocation.
2. Write a program to implement concept of linear array with following operations:
   i. Traverse an array.
   ii. Find minimum item, maximum item, and average of an array items.
   iii. Insert a new item at beginning, end and middle position within an array.
   iv. Delete an item from an array.
3. Write a program to implement singly linked list with following operations
   i. Insert a new item at beginning, end and middle position within a single linked list.
   ii. Delete an item from single linked list.
   iii. Traverse a single linked list.
4. Modify the singly linked list program to make it for doubly linked list.
5. Write a program to implement Stack with its operations (Push, Pop, Peek, IsEmpty) using:
   i. Using array
   ii. Using linked list
6. Write a program to evaluate postfix notation using stack.
7. Write program to implement queue with its operations (enqueue, dequeue) using:
   i. Using array
   ii. Using linked list
8. Modify the queue program to implement circular queue with its operations.
9. Write a program to implement binary search tree with insert and delete operations.
10. Write a program to implement depth first traverse and breadth first traverse on a graph.
11. Write program to implement linear search and binary search on a given array.
12. Write a program to sort a given list of 10000 random integers and compare their execution time using:
    i. Bubble sort
    ii. Insertion sort
    iii. Merge sort
    iv. Quick sort
    v. Radix sort

Reference Books-

- Data Structure- Schaum's Series- McGraw Hill Publication
- Data Structure- Horwitz and Sartaj Sahni
- Data Structure through C, Yashwant Kanekar, BPB Publication.

Modes of Evaluation and Rubric

The evaluation modes consist of performance in Two mid-semester Tests, Quiz/ Assignments, term work, end-semester examinations, and end-semester practical examinations.

List/Links of e-learning resource

Recommendation by Board of studies on	June-2022
Approval by Academic council on	June-2022
Compiled and designed by	Dr. Sandeep Raghuwanshi
Subject handled by department	Computer Science & Engineering

CO \ PO Mapping	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	2								1	2	3	3
CO2	3	3	1								1	2	3	3
CO3	3	3	1								2	2	2	2
CO4	3	3	1								1	1	2	2
CO5	3	3	1								1	2	3	3

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Computer Science and Engineering

Semester/Year			Program		B.Tech.
Subject Category	ESC	Subject Code:	ITC101	Subject Name:	Python Programming

Maximum Marks Allotted								Contact Hours			Total Credits
Theory				Practical			Total Marks				
End Sem	Mid-Sem	Assignment	Quiz	End Sem	Lab-Work	Quiz		L	T	P	
60	20	10	10	30	10	10	150	3	0	2	4

Prerequisites:

- High School Level Mathematics
- Elementary Knowledge of Computer

Course Objective:

This course introduces core programming basics—including data types, control structures, algorithm development, and program design with functions via the Python programming language. The course discusses the fundamental principles of Object-Oriented Programming.

Course Outcomes:

Upon completion of this course, the student will be able to:

CO-1: Ability to install python and its different packages.
CO-2: Implement solution logic of problem and draw it in the form of algorithm.
CO-3: Design and write a python program for given algorithm.
CO-4: Understand and apply the list logics to problem solution.
CO-5: Understand Object Oriented with reference to python programming.

UNITs	Descriptions	Hrs.	CO's
I	Introduction to computer science, algorithms, data representation in computers, hardware, software and operating system. Installation of python- interactive shell, IDLE, saving, editing, and running a script. The concepts of datatypes: variables, immutable variables, numerical types, operators, expressions, Indentation and comments in the program.	8	CO1
II	Conditional Statements- Conditions, Boolean Logic, Logical operators and Ranges. Control Statements- Break, Continue and Pass. Flow Control-if, if-else, nested if-else, Loop statements- for loop, while loop, Nested loops.	8	CO2
III	String: subscript operator, indexing, slicing a string; strings and number system: converting strings to numbers and vice versa. Strings and text files, manipulating files and directories, os and sys modules, text files: reading/writing text and numbers from/to a file, creating and reading a formatted file (csv or tab-separated).	9	CO3
IV	Lists, tuples, and dictionaries. Basic list operators, replacing, inserting, removing an element, searching and sorting lists, dictionary literals, adding and removing keys, accessing and replacing values, traversing dictionaries.	7	CO4
V	Classes and OOP: Classes, objects, attributes and methods, defining classes, design with classes, Inheritance, Overloading, Overriding, and Data hiding. Exception: Exception Handling, except clause, Try finally clause, User Defined Exceptions.	8	CO5
Guest Lectures (if any)		--	
Total Hours		40	

List of Experiments

1. Write a program in python to check a number whether it is prime or not.
2. Write a program to check a number whether it is palindrome or not.
3. Write a function to swap the values of two variables through a function.

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4. Write a python program to Read a file line by line and print it.
5. Write a program to display the number of lines in the file and size of a file in bytes.
6. Write a program to calculate the factorial of an integer using recursion.
7. Write a program to print Fibonacci series using recursion.
8. Write a program for binary search.
9. Python Program for Sum of squares of first n natural numbers.
10. Python Program to find sum of array.
11. Python program to read character by character from a file.
12. Python Program to print with your own font.
13. Python program to print even length words in a string.
14. Python program to check if a string is palindrome or not.
15. Program to print ASCII Value of a character.
16. Python program to find smallest and largest number in a list.
17. Python program to find the size of a Tuple.

Text Books-

- M. Mano, "Digital Logic and Computer Design", Pearson Education.
- T. L. Floyd, “Digital Fundamentals”, Pearson Education.
- A. Anand Kumar, “Fundamentals of Digital Circuits”, PHI.

Modes of Evaluation and Rubric

The evaluation modes consist of performance in Two mid-semester Tests, Quiz/ Assignments, term work, end-semester examinations, and end-semester practical examinations.

List/Links of e-learning resource

List and Links of e-learning resources:

4. https://nptel.ac.in/courses/108/105/108105132/
5. https://de-iitr.vlabs.ac.in/

Recommendation by Board of studies on	June-2022
Approval by Academic council on	June-2022
Compiled and designed by	Computer Science & Engineering
Subject handled by department	Computer Science & Engineering

CO \ PO Mapping	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3											3	1
CO2	3	2	3		1								2	1
CO3		3			1								3	1
CO4	2	3		1	1								2	1
CO5		3	1		2								2	1

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Computer Science and Engineering

Semester/Year		II/I	Program		B.Tech
Subject Category	ESC	Subject Code:	CSA104	Subject Name:	Principle of System Software

Maximum Marks Allotted						Contact Hours			Total Credits
Theory			Practical		Total Marks				
End Sem	Mid-Sem	Quiz	End Sem	Lab-Work		L	T	P	
60	20	20	-	-	100	3	-	-	3

Prerequisites:

Fundamental knowledge of Computer

Course Objective:

- To understand the relationship between system software and machine architecture.
- To understand the processing of an HLL program for execution on a computer.
- To understand the process of scanning and parsing.
- To know the design and implementation of assemblers, macro processor, linker and compiler.
- To have an understanding of loaders, system software tools.
- To understand and know the working of device drivers

Course Outcomes:

On successful completion of the course, the student will:

1. Be able to compare various system software related to the given system
2. Be able to understand the concepts required to develop the system software
3. Be able to make proper use of system software tools

UNITs	Descriptions	Hrs.	CO's
I	**System Software and Language Processors software tools:** Introduction, Language Processing Activities, Fundamentals of Language Processing & Language Specification, and Language Processor Development Tools. **Data Structures for Language Processing:** Search Data structures, Allocation Data Structures. **Software Tools:** Software Tools for Program Development, Editors, Debug Monitors, Programming Environments, User Interfaces.	8	1
II	**Assemblers:** Elements of Assembly Language Programming, A Simple Assembly Scheme, Pass Structure of Assemblers, Design of a Two Pass Assembler,	8	1
III	**Macros and Macro Processors:** Macro Definition and Call, Macro Expansion, Nested Macro Calls, Advanced Macro Facilities, Design of a Macro Preprocessor.	9	2
IV	**Interpreters:** Use and overview of interpreters, Pure and impure interpreters.	5	2
V	**Linkers and Loaders:** Introduction to linkers, Relocation and Linking Concepts, Design of a Linker, Self-Relocating Programs and Loaders	10	3
Guest Lectures (if any)		NIL	
Total Hours		40	

Suggestive list of experiments:

Text Book-

- D. M. Dhamdhere, "Systems Programming and Operating Systems", Second Revised

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Edition, Tata McGraw-Hill, 1999.

Reference Books-

- Leland L. Beck, "System Software – An Introduction to Systems Programming", 3rd
- Edition, Pearson Education Asia, 2000.
- Santanu Chattopadhyay, "System Software", Prentice-Hall India, 2007
- Alfred V. Aho, Monica S. Lam, Ravi Sethi, Jeffrey D. Ullman, "Compilers: Principles, Techniques, and Tools",2nd Edition, Pearson Education Asia

Modes of Evaluation and Rubric

List/Links of e-learning resource

Recommendation by Board of studies on	14.06.2022
Approval by Academic council on	
Compiled and designed by	Computer Science & Engineering
Subject handled by department	Computer Science & Engineering

CO \ PO Mapping	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	1			1								1	1
CO2	3	2	3	2	1								2	2
CO3	3	1			1								1	1
CO4	2	3	2	1	1								2	1
CO5	2	3	1		2								2	1

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Department of Applied Science

Semester/Year		Second/First	Program		B. Tech.				
Subject Category	Departmental Core	Subject Code:	MAB-102	Subject Name:	Statistics : Probability Distributions and Differential Equations				
Maximum Marks Allotted						Contact Hours			Total Credits
Theory			Practical		Total Marks				
End Sem	Mid-Sem	Quiz	End Sem	Lab-Work		L	T	P	
60	20	20	-	-	100	3	1	-	4

Prerequisites:

Basics of Differentiations, Integrations and Statistics.

Course Objective:

The objective of this course is to familiarize the prospective engineers with techniques in Differential equations and Statistics. It aims to equip the students with standard concepts and tools at an intermediate to advanced level that will serve them well towards tackling more advanced level of mathematics and applications that they would find useful in their disciplines.

Course Outcomes:

This course primarily contributes to applied mathematics program outcomes that develop students abilities to:

1. Acquire the basic knowledge of Statistics: Probability Distributions with their applications and fitting of curves using method of least squares.
2. Learn the principal concepts about sampling and its advantages and also categorized the sampling methods.
3. The Effective Mathematical Tools for the Solutions of Differential Equations that Model Physical Processes.
4. Differential Equation for Solving Engineering Problems
5. Partial Differential Equations are very much useful for Solving Various Boundary Value Problems

UNITs	Descriptions	Hrs.	CO's
I	Probability Distribution I : Binomial, Poisson and Normal distributions and their Mean and Variance, Methods of Least Squares and curve fitting.	8	1
II	Probability Sampling distributions: t, F, χ^2 distributions and their applications.	8	2
III	Differential Equations: Differential Equations of first order and first degree, first order and higher degree, Linear Differential Equation, Non-linear Differential Equation, Linear Differential of Higher orders with constant coefficient.	8	3
IV	Differential Equation of other Types: Homogeneous Linear Differential Equations, Legendre Linear Equation, Simultaneous Linear Differential Equation. Method of Variation of Parameters.	8	4
V	Partial Differential Equations: Definition and formation of Partial Differential Equations, Lagrange's Linear PDE, Non-linear PDE, Linear Partial Differential Equation of Second Order with Constant Coefficients. Applications of PDE (Wave equation and Heat Equations)	8	5
Total Hours		40	

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Reference Books:
1. Higher Engineering Mathematics by B. S. Grewal 2. Engineering Mathematics by B. V. Rammana 3. Advance Engineering Mathematics by E. Kreyszig 4. Veerarajan T, Statistics, Probability and Random Process, 2nd Edition, Tata McGraw Hill Publishing company Ltd., New Delhi

Recommendation by Board of studies on	14-06-2022
Approval by Academic council on	16-06-2022
Compiled and designed by	Board of Studies Applied Mathematics; Chairman Dr. Shailesh Jaloree

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Computer Science and Engineering

Semester/Year			Program		B.Tech.
Subject Category	ESC	Subject Code:	CSL110	Subject Name:	Computer Workshop

Maximum Marks Allotted								Contact Hours			Total Credits
Theory				Practical			Total Marks				
End Sem	Mid-Sem	Assignment	Quiz	End Sem	Lab-Work	Quiz		L	T	P	
--	--	--	--	60	20	20	100	--	--	2	2

Prerequisites:

Course Objective:

1. To teach principles of operating system including File handling utilities, Security by file permissions, Process utilities, Disk utilities, Networking Commands, Basic Linux commands, Scripts and filters.
2. To familiarize fundamentals of the Bourne again shell (bash), shell programming, pipes, input and output redirection Control structures, arithmetic in shell interrupt processing, functions, debugging shell scripts.
3. To impart fundamentals of file concepts kernel support for file, File structure related system calls (file API's).
4. To facilitate students in understanding Inter process communication.
5. To facilitate students in understanding semaphore and shared memory.
6. To facilitate students in understanding process.

Course Outcomes:

Upon completion of this course, the student will be able to:

CO1. Ability to use various Linux commands that are used to manipulate system operations at admin level and a prerequisite to pursue job as a Network administrator.
CO2. Ability to write Shell Programming using Linux commands.
CO3. Ability to design and write application to manipulate internal kernel level Linux File System.
CO4. Ability to develop IPC-API's that can be used to control various processes for synchronization.
CO5. Ability to develop Network Programming that allows applications to make efficient use of resources available on different machines in a network.

UNITs	Descriptions	Hrs.	CO's
I	**INTRODUCTION TO LINUX AND LINUX UTILITIES**: A brief history of LINUX, architecture of LINUX, features of LINUX, introduction to vi editor. Linux commands, file handling utilities, security by file permissions, process utilities, disk utilities, networking commands, Text Processing utilities and backup utilities	4	CO1
II	**Introduction to Shells**: Linux Session, Standard Streams, Redirection, Pipes, Command-Line Editing, Options, Shell/Environment Customization. **Filters:** Filters and Pipes, Concatenating files, Display Beginning and End of files, Operations on Characters, Files with Duplicate Lines, Count Characters, Words or Lines, Comparing Files.	4	CO2
III	**Grep:** Operation, grep Family, Searching for File Content. **Sed**: Scripts, Operation, Addresses, commands, Applications, grep and sed. UNIX FILE STRUCTURE: Introduction to UNIX file system, inode (Index Node), file descriptors, system calls and device drivers. **File Management**: File Structures, System Calls for File Management, Directory API.	4	CO3
IV	**PROCESS AND SIGNALS**: Process, process identifiers, process structure: process table, viewing processes, system processes, process scheduling, zombie processes, orphan process, unreliable	4	CO4

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	signals, interrupted system calls. **File locking**: creating lock files, locking regions, use of read and write with locking, competing locks, other lock commands, deadlocks.		
V	**INTER PROCESS COMMUNICATION**: Pipe, process pipes, the pipe call, parent and child processes, and named pipes, semaphores, message queues, shared memory. **INTRODUCTION TO SOCKETS**: Socket, socket connections - socket attributes, socket addresses.	4	CO5
Guest Lectures (if any)		--	
Total Hours		20	

List of Experiments

1. Write a program using echo, printf, script, passwd, uname, who, date, stty, pwd commands.
2. Write a program using unlink, du, df, mount, umount, find, unmask, ulimit, ps, w, finger, arp, ftp commands.
3. Write a program using telnet, rlogin.Text Processing utilities and backup utilities , tail, head , sort, nl, uniq, grep, egrep, fgrep, cut, paste, join, tee, pg, comm, cmp, diff, tr, awk commands.
4. Write a shell script that accepts a file name, starting and ending line numbers as arguments and displays all the lines between the given line numbers.
5. Illustrate by writing script that will print, message "Hello World, in Bold and Blink effect, and in different colours like red, brown etc using echo commands?
6. Write a shell script that deletes all lines containing a specified word in one or more files supplied as arguments to it.
7. Illustrate by writing script using for loop to print the following patterns?
8. Write a shell script that displays a list of all the files in the current directory to which the user has read, write and execute permissions.
9. Write a program inter-process communication.
10. Write a program to communicate using sockets.

Text Books-

1. W. Richard. Stevens (2005), Advanced Programming in the UNIX Environment, 3rd edition, Pearson Education, New Delhi, India.
2. Unix and shell Programming Behrouz A. Forouzan, Richard F. Gilberg.Thomson

REFERENCES Books-:

1. Linux System Programming, Robert Love, O'Reilly, SPD.
2. Advanced Programming in the UNIX environment, 2nd Edition, W.R.Stevens, Pearson Education.
3. UNIX Network Programming, W.R. Stevens, PHI. UNIX for Programmers and Users, 3rd Edition, Graham Glass, King Ables, Pearson Education

Modes of Evaluation and Rubric

The evaluation modes consist of performance in Quiz/ Assignments, term work, and end-semester practical examinations.

List/Links of e-learning resource

Recommendation by Board of studies on	June-2022
Approval by Academic council on	June-2022
Compiled and designed by	Computer Science & Engineering
Subject handled by department	Computer Science & Engineering

Dr. Kanak Saxena
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SAMRAT ASHOK TECHNOLOGICAL INSTITUTE
(Engineering College), VIDISHA M.P.
(An Autonomous Institute Affiliated to RGPV Bhopal)
Department of Humanities and Management

Semester/Year	II Year	Program	B.Tech All Branches
Subject Category: MAC	Subject Code: MAC102	Subject Name:	**Professional Ethics and Social Responsibility**

Maximum Marks Allotted								Contact Hours			Total Credits
Theory				Practical			Total Marks				
End Sem	Mid-Sem	Quiz	Assignment	End Sem	Lab-Work	Quiz		L	T	P	
00	00	00	00	30	10	10	50	0	0	2	Grade

Prerequisites:

To enable the students to instill moral, to create an awareness of professional ethics, human values, loyalty and social responsibility.

Course Objective:

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

1. To learn the importance of values and ethics in personal life and professional careers.
2. To gain knowledge of ethical behavior.
3. To acquire the basics of social responsibility.

Course Outcomes:

1. To imbibe and internalize the basic purpose of human values.
2. To appreciate professional rules and codes of conduct in personal life and professional careers.
3. To know the importance of values and ethics in professional behavior.
4. To impart norms of professional ethics in life through **rationality**, **consistency** and **impartiality**.
5. To inculcate the sense of social responsibility.

UNITs	Descriptions	Hrs.	CO's
I	Principles of professional ethics: honesty, trustworthiness, loyalty, being law-abiding, no sinister motives, socially responsible, respect, accountability and fairness to all	8	1
II	Codes of conduct: public, clients, professional community, profession, workplace rights and responsibilities, other stakeholders.	6	2
III	Factors necessitating professional ethics: advisory responsibilities, contractual duties; The importance of ethical behavior in business.	4	3
IV	Personal ethics: impartiality, rationality, consistency and reversibility Norms of professional ethics in our life.	8	4
V	Corporate social responsibility: environmental, philanthropic, ethical,	9	5

	and economic responsibility.		
Guest Lectures (if any)		2	
Total Hours		40	

Suggestive list of experiments:

1. N.A

1. Text Book- Professional ethics includes Human values, R. Subramanian, Oxford higher education.

Reference Books-

2. Professional Ethics and Social Responsibility, Daniel E. Wueste, Rowman and Littlefield Publication, INC
3. Professional ethics and human values, R. S. Naagarazan, New age international (P) limited ,New Delhi,2006.
4. Human values and professional ethics,Jayshree Suresh, B. S. Raghvan,S. Chand
5. http://www.slideword.org/slidestag.aspx/human-values-and-Professional-ethics**.**

Modes of Evaluation and Rubric

Questionnaire,Quiz,Presentation and standard procedure will be followed .

List/Links of e-learning resource

- https://onlinecourses.nptel.ac.in
- https://www.classcentral.com (swayam)

Recommendation by Board of studies on	26/02/2022
Approval by Academic council on	
Compiled and designed by	Dr. Manorama Saini and Dr. VeenaDatar
Subject handled by department	Humanities and Management